

Data dictionary for QIF Library Geometry.xsd (normative)

schema location: **..\QIFLibrary\Geometry.xsd**
attributeFormDefault: **unqualified**
elementFormDefault: **qualified**
targetNamespace: **http://qifstandards.org/xsd/qif2**

Complex types

[Aggregate12CoreType](#)
[Aggregate12Type](#)
[Aggregate13CoreType](#)
[Aggregate13Type](#)
[ArcCircular12CoreType](#)
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[ArraySubCurve12Type](#)
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[Curve12BaseType](#)
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[Cylinder23CoreType](#)
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[GeometryBaseType](#)
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[MeshTriangleCoreType](#)
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[Nurbs12CoreType](#)
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[Nurbs13CoreType](#)
[Nurbs13Type](#)
[Nurbs23CoreType](#)
[Nurbs23Type](#)
[Offset23CoreType](#)
[Offset23Type](#)
[PathTriangulationCoreType](#)
[PathTriangulationType](#)
[Plane23CoreType](#)
[Plane23Type](#)
[PointEntityType](#)
[PointSetType](#)

Simple types

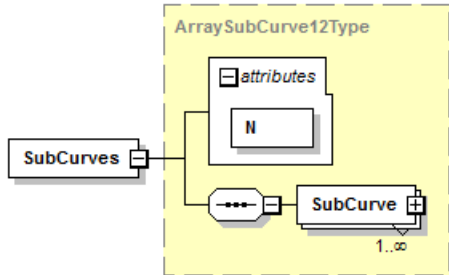
[ArcConicFormEnumType](#)
[Attr23CoreEnumType](#)

[Polyline12CoreType](#)
[Polyline12Type](#)
[Polyline13CoreType](#)
[Polyline13Type](#)
[Revolution23CoreType](#)
[Revolution23Type](#)
[Ruled23CoreType](#)
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[Segment12CoreType](#)
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[Sphere23CoreType](#)
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[Spline12CoreType](#)
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[Spline23CoreType](#)
[Spline23Type](#)
[SurfaceBaseType](#)
[SurfaceCoreBaseType](#)
[SurfaceCoreType](#)
[SurfaceMeshSetType](#)
[SurfaceSetType](#)
[Torus23CoreType](#)
[Torus23Type](#)

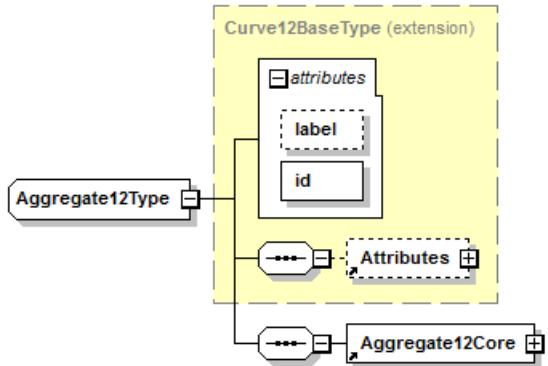
complexType **Aggregate12CoreType**

diagram						
type	extension of CurveCoreBaseType					
properties	base CurveCoreBaseType					
children	SubCurves					
used by	element Aggregate12Core					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve.
annotation	documentation The Aggregate12CoreType defines the mathematical core of the geometric entity 'aggregate_curve(t):R1->R2'. The aggregate curve is a sequence of parametric sub-curves.					

element **Aggregate12CoreType/SubCurves**

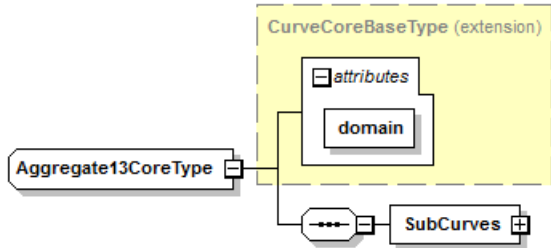
diagram						
type	ArraySubCurve12Type					
properties	content complex					
children	SubCurve					
attributes	Name N	Type NaturalType	Use required	Default	Fixed	Annotation documentation The required N attribute is the number of objects in this array.
annotation	documentation The SubCurves element is an array of oriented sub-curves.					

complexType **Aggregate12Type**

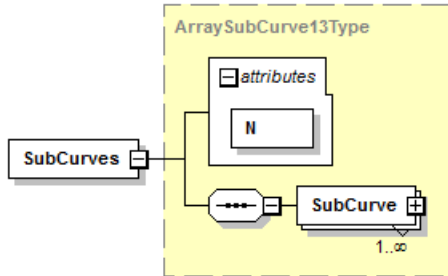
diagram						
type	extension of Curve12BaseType					
properties	base Curve12BaseType					
children	Attributes Aggregate12Core					
used by	element Aggregate12					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique

	model entity identifier.
annotation	documentation The Aggregate12Type defines the geometric entity 'aggregate_curve(t):R1->R2'. The 2D curves are normally used to define a trimming curve in the parametric space of a surface.

complexType **Aggregate13CoreType**

diagram						
type	extension of CurveCoreBaseType					
properties	base CurveCoreBaseType					
children	SubCurves					
used by	element Aggregate13Core					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve.
annotation	documentation The Aggregate13CoreType defines the mathematical core of the geometric entity 'aggregate_curve(t):R1->R3'. The aggregate curve is a sequence of parametric sub-curves.					

element **Aggregate13CoreType/SubCurves**

diagram						
type	ArraySubCurve13Type					
properties	content complex					
children	SubCurve					
attributes	Name N	Type NaturalType	Use required	Default	Fixed	Annotation documentation The required N attribute is the number of objects in this array.

annotation	documentation The SubCurves element is an array of orientated sub-curves.
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complexType **Aggregate13Type**

diagram						
type	extension of Curve13BaseType					
properties	base Curve13BaseType					
children	Attributes Aggregate13Core Transform					
used by	element Aggregate13					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Aggregate13Type defines the geometric entity 'aggregate_curve(t):R1->R3'. Any 3D geometry can have an additional transformation matrix.					

element **Aggregate13Type/Transform**

diagram						
type	ElementReferenceType					
properties	minOcc	0				
	maxOcc	1				
	content	complex				

children	Id
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.

complexType **ArcCircular12CoreType**


diagram	<pre>classDiagram class CurveCoreBaseType { +attributes +domain } class ArcCircular12CoreType { +attributes +turned +Radius +Center +DirBeg } CurveCoreBaseType < -- ArcCircular12CoreType CurveCoreBaseType ..> ArcCircular12CoreType : turned</pre>					
type	extension of CurveCoreBaseType					
properties	base CurveCoreBaseType					
children	Radius Center DirBeg					
used by	element ArcCircular12Core					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve. documentation The optional turned attribute shows if the arc is inverted. A value of 1 (or true) means the arc is inverted. A value of 0 (or false) means the arc is not inverted.
	turned	xs:boolean		0		
annotation	documentation The ArcCircular12CoreType defines the mathematical core of the geometric entity 'circular_arc(t):R1->R2'. A circular arc is defined as a portion of a circle.					

attribute **ArcCircular12CoreType/@turned**


type	xs:boolean
properties	default 0
annotation	documentation

	The optional turned attribute shows if the arc is inverted. A value of 1 (or true) means the arc is inverted. A value of 0 (or false) means the arc is not inverted.
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element ArcCircular12CoreType/Radius

diagram	
type	xs:double
properties	content simple
annotation	documentation The Radius element is the arc radius.

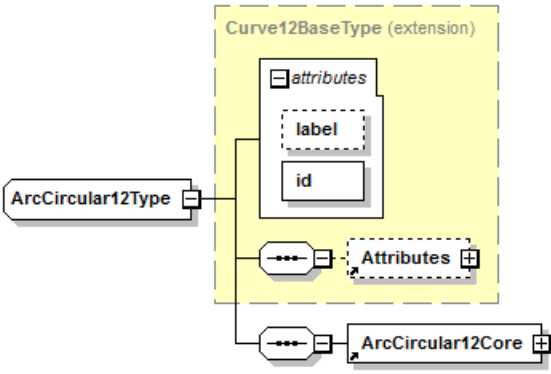
element ArcCircular12CoreType/Center

diagram	
type	Point2dSimpleType
properties	content simple
facets	Kind Value Annotation length 2
annotation	documentation The Center element is the 2D coordinates of center of the arc.

element ArcCircular12CoreType/DirBeg

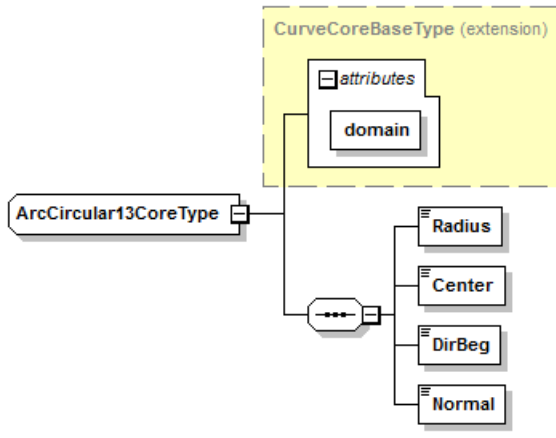
diagram	
type	UnitVector2dSimpleType
properties	content simple
facets	Kind Value Annotation length 2
annotation	documentation The DirBeg element is a 2D unit vector representing the beginning of the circular arc.

complexType ArcCircular12Type


diagram	
type	extension of Curve12BaseType

properties	base Curve12BaseType					
children	Attributes ArcCircular12Core					
used by	element ArcCircular12					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The ArcCircular12Type defines the geometric entity 'circular_arc(t):R1->R2'. The 2D curves are normally used to define a trimming curve in the parametric space of a surface.					


complexType ArcCircular13CoreType

diagram						
type	extension of CurveCoreBaseType					
properties	base CurveCoreBaseType					
children	Radius Center DirBeg Normal					
used by	element ArcCircular13Core					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve.
annotation	documentation The ArcCircular13CoreType defines the mathematical core of the geometric entity 'circular_arc(t):R1->R3'. A circular arc is defined as a portion of a circle.					


element **ArcCircular13CoreType/Radius**

diagram	
type	xs:double
properties	content simple
annotation	documentation The Radius element is the arc radius.


element **ArcCircular13CoreType/Center**

diagram	
type	PointSimpleType
properties	content simple
facets	Kind Value Annotation length 3
annotation	documentation The Center element is the 3D coordinates of center of the arc.

element **ArcCircular13CoreType/DirBeg**

diagram	
type	UnitVectorSimpleType
properties	content simple
facets	Kind Value Annotation length 3
annotation	documentation The DirBeg element is a unit vector representing the beginning of the circular arc.

element **ArcCircular13CoreType/Normal**

diagram	
type	UnitVectorSimpleType
properties	content simple
facets	Kind Value Annotation length 3
annotation	documentation The Normal element is normal of the plane wherein the circular arc is defined.

complexType **ArcCircular13Type**

diagram						
type	extension of Curve13BaseType					
properties	base Curve13BaseType					
children	Attributes ArcCircular13Core Transform					
used by	element ArcCircular13					
attributes	Name	Type	Use	Default	Fixed	Annotation
	label	xs:string				documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The ArcCircular13Type defines the geometric entity 'circular_arc(t):R1->R3'. Any 3D geometry can have an additional transformation matrix.					

element **ArcCircular13Type/Transform**

diagram						
type	ElementReferenceType					
properties	minOcc	0	maxOcc	1	content	complex
children	Id					
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.					

complexType **ArcConic12CoreType**

diagram	<pre> classDiagram class CurveCoreBaseType { +attributes +domain } class ArcConic12CoreType { +attributes +form +turned +A +B +Center +DirBeg } CurveCoreBaseType < -- ArcConic12CoreType </pre>					
type	extension of CurveCoreBaseType					
properties	base CurveCoreBaseType					
children	A B Center DirBeg					
used by	element ArcConic12Core					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve.
	form	ArcConicFormEnumType	required			documentation The required form attribute specifies the form of the conic arc.
	turned	xs:boolean		0		documentation The optional turned attribute shows if the arc is inverted. A value of 1 (or true) means the arc is inverted. A value of 0 (or false) means the arc is not inverted.
annotation	documentation The ArcConic13CoreType defines the mathematical core of the geometric entity 'conic_arc(t):R1->R2'. A conic arc is defined as a portion of a conic curve. The conic curve can have one the following forms: an ellipse, a parabola, or a hyperbola.					


attribute **ArcConic12CoreType/@form**

type	ArcConicFormEnumType		
properties	use	required	
facets	Kind	Value	Annotation
	enumeration	PARABOLA	
	enumeration	ELLIPSE	
	enumeration	HYPERBOLA	
annotation	documentation The required form attribute specifies the form of the conic arc.		


attribute **ArcConic12CoreType/@turned**

type	xs:boolean
properties	default 0
annotation	documentation The optional turned attribute shows if the arc is inverted. A value of 1 (or true) means the arc is inverted. A value of 0 (or false) means the arc is not inverted.


element **ArcConic12CoreType/A**

diagram	
type	xs:double
properties	content simple
annotation	documentation The major diameter of the arc.


element **ArcConic12CoreType/B**

diagram	
type	xs:double
properties	content simple
annotation	<div>documentation</div> <div>The minor diameter of the arc.</div>

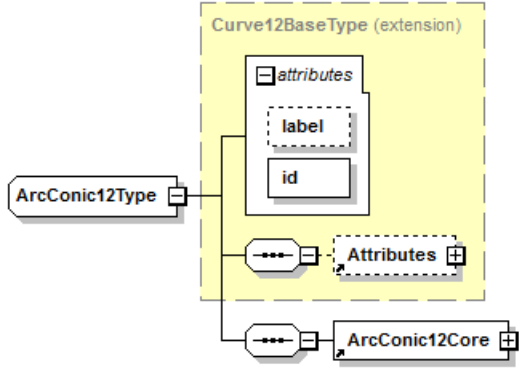
element **ArcConic12CoreType/Center**

diagram			
type	Point2dSimpleType		
properties	content	simple	
facets	Kind	Value	Annotation
	length	2	
annotation	documentation The Center element is the 2D coordinates of center of the arc.		

element **ArcConic12CoreType/DirBeg**

diagram	
type	UnitVector2dSimpleType
properties	content simple
facets	Kind Value Annotation length 2
annotation	documentation The DirBeg element is a 2D unit vector representing the beginning of the conic arc.

complexType **ArcConic12Type**

diagram						
type	extension of Curve12BaseType					
properties	base Curve12BaseType					
children	Attributes ArcConic12Core					
used by	element ArcConic12					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree. documentation The required id attribute is the unique model entity identifier.
	id	QIFIdType	required			
annotation	documentation The ArcConic12Type defines the geometric entity 'conic_arc(t):R1->R2'. The 2D curves are normally used to define a trimming curve in the parametric space of a surface.					


complexType **ArcConic13CoreType**

diagram						
type	extension of CurveCoreBaseType					
properties	base CurveCoreBaseType					
children	A B Center DirBeg Normal					
used by	element ArcConic13Core					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve. documentation The required form attribute specifies the form of the conic arc.
	form	ArcConicFormEnumType	required			
annotation	documentation The ArcConic13CoreType defines the mathematical core of the geometric entity 'conic_arc(t):R1->R3'. A conic arc is defined as a portion of a conic curve. The conic curve can have one the following forms: an ellipse, a parabola, or a hyperbola.					


attribute **ArcConic13CoreType/@form**

type	ArcConicFormEnumType		
properties	use required		
facets	Kind enumeration enumeration enumeration	Value PARABOLA ELLIPSE HYPERBOLA	Annotation
annotation	documentation The required form attribute specifies the form of the conic arc.		


element **ArcConic13CoreType/A**

diagram	
type	xs:double
properties	content simple
annotation	documentation The major diameter of the arc.


element **ArcConic13CoreType/B**

diagram	
type	xs:double
properties	content simple
annotation	documentation The minor diameter of the arc.


element **ArcConic13CoreType/Center**

diagram							
type	PointSimpleType						
properties	content simple						
facets	<table><tr><td>Kind</td><td>Value</td><td>Annotation</td></tr><tr><td>length</td><td>3</td><td></td></tr></table>	Kind	Value	Annotation	length	3	
Kind	Value	Annotation					
length	3						
annotation	<p>documentation</p> <p>The Center element is the 3D coordinates of center of the arc.</p>						

element **ArcConic13CoreType/DirBeg**

diagram							
type	UnitVectorSimpleType						
properties	content simple						
facets	<table><tr><td>Kind</td><td>Value</td><td>Annotation</td></tr><tr><td>length</td><td>3</td><td></td></tr></table>	Kind	Value	Annotation	length	3	
Kind	Value	Annotation					
length	3						
annotation	<p>documentation</p> <p>The DirBeg element is a unit vector representing the beginning of the conic arc.</p>						

element **ArcConic13CoreType/Normal**

diagram	
type	UnitVectorSimpleType

properties	content simple		
facets	Kind length	Value 3	Annotation
annotation	documentation The Normal element is normal of the plane wherein the conic arc is defined.		

complexType **ArcConic13Type**

diagram	<pre>classDiagram class Curve13BaseType { +attributes +label +id } class ArcConic13Type { +label +id } class Attributes { } class ArcConic13Core { +Transform } Curve13BaseType < -- ArcConic13Type ArcConic13Type *-- Attributes ArcConic13Type *-- ArcConic13Core</pre>						
type	extension of Curve13BaseType						
properties	base Curve13BaseType						
children	Attributes ArcConic13Core Transform						
used by	element ArcConic13						
attributes	Name	Type	Use	Default	Fixed	Annotation	
	label	xs:string				documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.	
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.	
annotation	documentation The ArcConic13Type defines the geometric entity 'conic_arc(t):R1->R3'. Any 3D geometry can have an additional transformation matrix.						

element **ArcConic13Type/Transform**

diagram	
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type	ElementReferenceType
properties	minOcc 0 maxOcc 1 content complex
children	Id
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.

complexType **ArraySubCurve12Type**

diagram						
children	SubCurve					
used by	element Aggregate12CoreType/SubCurves					
attributes	Name N	Type NaturalType	Use required	Default	Fixed	Annotation documentation The required N attribute is the number of objects in this array.

attribute **ArraySubCurve12Type/@N**

type	NaturalType		
properties	use required		
facets	Kind minInclusive	Value 1	Annotation
annotation	documentation The required N attribute is the number of objects in this array.		

element **ArraySubCurve12Type/SubCurve**

diagram						
type	Curve12OrientedType					
properties	minOcc	1	maxOcc	unbounded	content	complex
children	Curve12Core					
attributes	Name turned	Type xs:boolean	Use	Default 0	Fixed	Annotation documentation The optional turned attribute shows if the Curve12 is inverted. A value of 1 (or true) means the Curve12 is inverted from the Curve12Core. A value of 0 (or false) means the Curve12 is not inverted.
annotation	documentation The ArraySubCurve12Type defines an array of Curve12.					

complexType **ArraySubCurve13Type**

diagram						
children	SubCurve					
used by	element Aggregate13CoreType/SubCurves					
attributes	Name N	Type NaturalType	Use required	Default	Fixed	Annotation documentation The required N attribute is the number of objects in this array.
annotation	documentation The ArraySubCurve13Type defines an array of Curve13 subcurves.					

attribute **ArraySubCurve13Type/@N**

type	NaturalType		
properties	use required		
facets	Kind minInclusive	Value 1	Annotation
annotation	documentation The required N attribute is the number of objects in this array.		

element **ArraySubCurve13Type/SubCurve**

diagram						
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type	Curve13OrientedType					
properties	minOcc	1	maxOcc	unbounded	content	complex
children	Curve13Core					
attributes	Name turned	Type xs:boolean	Use	Default 0	Fixed	Annotation documentation The optional turned attribute shows if the Curve13 is inverted. A value of 1 (or true) means the Curve13 is inverted from the Curve13Core. A value of 0 (or false) means the Curve13 is not inverted.
annotation	documentation Each SubCurve element is a Curve13.					

complexType **Cone23CoreType**

diagram	<pre>classDiagram class SurfaceCoreBaseType { +attributes +form } class Cone23CoreType { +attributes +turnedV +scaleU +scaleV } class DiameterBottom class DiameterTop class Length class Axis class Sweep SurfaceCoreBaseType < -- Cone23CoreType Cone23CoreType "1" *-- "1" group group "1" { DiameterBottom DiameterTop Length Axis Sweep }</pre>
type	extension of SurfaceCoreBaseType
properties	base SurfaceCoreBaseType
children	DiameterBottom DiameterTop Length Axis Sweep
used by	element Cone23Core

attributes	Name	Type	Use	Default	Fixed	Annotation
	form	Attr23CoreEnumType				documentation The optional form attribute describes the surface form.
	turnedV	xs:boolean		false		documentation The optional turnedV attribute shows if the v direction of the cone must be inverted. A value of 1 (or true) means the v direction must be inverted. A value of 0 (or false) means the v direction must not be inverted.
	scaleU	DoublePositiveType		1.0		documentation The optional scaleU attribute is the scaling coefficient of the u direction of the parametric space.
	scaleV	DoublePositiveType		1.0		documentation The optional scaleV attribute is the scaling coefficient of the v direction of the parametric space.
annotation	documentation The Cone23CoreType defines the mathematical core of the geometric entity 'conical_surface(u,v):R2->R3'.					

attribute **Cone23CoreType/@turnedV**

type	xs:boolean
properties	default false
annotation	documentation The optional turnedV attribute shows if the v direction of the cone must be inverted. A value of 1 (or true) means the v direction must be inverted. A value of 0 (or false) means the v direction must not be inverted.

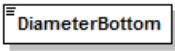
attribute **Cone23CoreType/@scaleU**

type	DoublePositiveType		
properties	default	1.0	
facets	Kind	Value	Annotation
	minExclusive	0.0	
annotation	documentation The optional scaleU attribute is the scaling coefficient of the u direction of the parametric space.		


attribute **Cone23CoreType/@scaleV**

type	DoublePositiveType		
properties	default	1.0	
facets	Kind	Value	Annotation
	minExclusive	0.0	
annotation	documentation The optional scaleV attribute is the scaling coefficient of the v direction of the parametric space.		


element **Cone23CoreType/DiameterBottom**

diagram	
type	xs:double
properties	content simple
annotation	documentation The DiameterBottom element is cone diameter at the bottom.

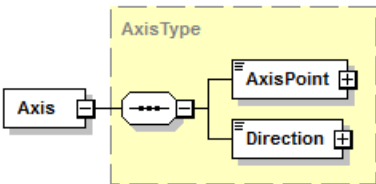
element **Cone23CoreType/DiameterTop**

diagram	
type	xs:double
properties	content simple
annotation	documentation The DiameterBottom element is cone diameter at the top.

element **Cone23CoreType/Length**

diagram	
type	xs:double
properties	content simple
annotation	documentation The Length element is the cone height - distance between the cone top and bottom.

element **Cone23CoreType/Axis**

diagram	
type	AxisType
properties	content complex

children	AxisPoint Direction
annotation	documentation The Axis is the unit axis vector of the cone.

element **Cone23CoreType/Sweep**

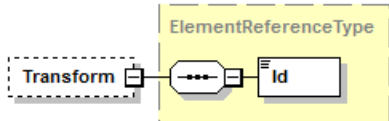
diagram	
type	SweepType
properties	content complex
children	DirBeg DomainAngle
annotation	documentation The Sweep element gives the start direction and the swept angle for the cone. The start Vector of the Sweep must lie in a plane normal to the axis of the cone.

complexType **Cone23Type**

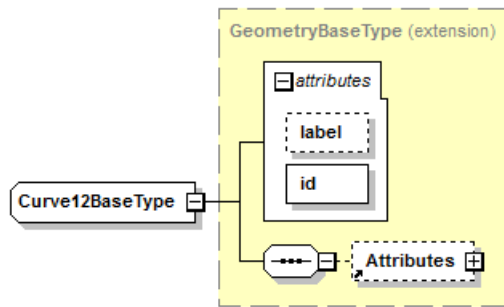
diagram						
type	extension of SurfaceBaseType					
properties	base SurfaceBaseType					
children	Attributes Cone23Core Transform					
used by	element Cone23					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required

		id attribute is the unique model entity identifier.
annotation	documentation The Cone23Type defines the geometric entity 'conical_surface(u,v):R2->R3'. Any surface can have an additional transformation matrix.	

element Cone23Type/Transform

diagram		
type	ElementReferenceType	
properties	minOcc 0 maxOcc 1 content complex	
children	Id	
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.	

complexType Curve12BaseType

diagram						
type	extension of GeometryBaseType					
properties	base	GeometryBaseType				
	abstract	true				
children	Attributes					
used by	element	Curve12				
	complexType	Aggregate12Type ArcCircular12Type ArcConic12Type Nurbs12Type Polyline12Type Segment12Type Spline12Type				
attributes	Name	Type	Use	Default	Fixed	Annotation
	label	xs:string				documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique

	model entity identifier.
annotation	documentation The Curve12BaseType is the abstract base type for all geometric 2D curves (curve(t):R1->R2) present in the CAD scene.

complexType Curve12OrientedType

diagram	<pre>classDiagram class Curve12OrientedType { +turned } class Curve12Core { } class Aggregate12Core { } class ArcCircular12Core { } class ArcConic12Core { } class Nurbs12Core { } class Polyline12Core { } class Segment12Core { } class Spline12Core { } Curve12OrientedType < -- Curve12Core Curve12Core < -- Aggregate12Core Curve12Core < -- ArcCircular12Core Curve12Core < -- ArcConic12Core Curve12Core < -- Nurbs12Core Curve12Core < -- Polyline12Core Curve12Core < -- Segment12Core Curve12Core < -- Spline12Core</pre>					
children	Curve12Core					
used by	element ArraySubCurve12Type/SubCurve					
attributes	Name	Type	Use	Default	Fixed	Annotation
	turned	xs:boolean		0		documentation The optional turned attribute shows if the Curve12 is inverted. A value of 1 (or true) means the Curve12 is inverted from the Curve12Core. A value of 0 (or false) means the Curve12 is not inverted.

attribute Curve12OrientedType/@turned

type	xs:boolean
properties	default 0
annotation	documentation The optional turned attribute shows if the Curve12 is inverted. A value of 1 (or true) means the Curve12 is inverted from the Curve12Core. A value of 0 (or false) means the Curve12 is not inverted.

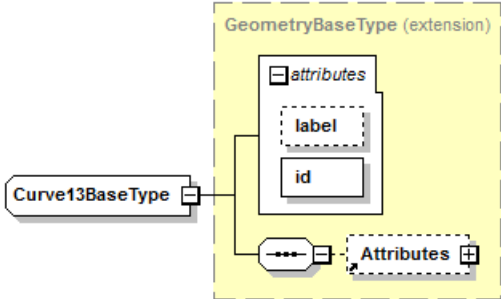
complexType **Curve12SetType**

diagram						
children	Curve12					
used by	element Curve12Set					
attributes	Name N	Type NaturalType	Use required	Default	Fixed	Annotation documentation The required N attribute is the number of objects in this set.
annotation	documentation The Curve12SetType represents a container for storing all 2D curves present in the CAD scene.					

attribute **Curve12SetType/@N**

type	NaturalType		
properties	use required		
facets	Kind minInclusive	Value 1	Annotation
annotation	documentation The required N attribute is the number of objects in this set.		

complexType **Curve13BaseType**

diagram																			
type	extension of GeometryBaseType																		
properties	<table><tr><td>base</td><td>GeometryBaseType</td></tr><tr><td>abstract</td><td>true</td></tr></table>	base	GeometryBaseType	abstract	true														
base	GeometryBaseType																		
abstract	true																		
children	Attributes																		
used by	<table><tr><td>element</td><td>Curve13</td></tr><tr><td>complexTypes</td><td>Aggregate13Type ArcCircular13Type ArcConic13Type Nurbs13Type Polyline13Type Segment13Type Spline13Type</td></tr></table>	element	Curve13	complexTypes	Aggregate13Type ArcCircular13Type ArcConic13Type Nurbs13Type Polyline13Type Segment13Type Spline13Type														
element	Curve13																		
complexTypes	Aggregate13Type ArcCircular13Type ArcConic13Type Nurbs13Type Polyline13Type Segment13Type Spline13Type																		
attributes	<table><tr><th>Name</th><th>Type</th><th>Use</th><th>Default</th><th>Fixed</th><th>Annotation</th></tr><tr><td>label</td><td>xs:string</td><td></td><td></td><td></td><td><div>documentation</div><div>The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.</div></td></tr><tr><td>id</td><td>QIFIdType</td><td>required</td><td></td><td></td><td><div>documentation</div><div>The required id attribute is the unique model entity identifier.</div></td></tr></table>	Name	Type	Use	Default	Fixed	Annotation	label	xs:string				<div>documentation</div> <div>The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.</div>	id	QIFIdType	required			<div>documentation</div> <div>The required id attribute is the unique model entity identifier.</div>
Name	Type	Use	Default	Fixed	Annotation														
label	xs:string				<div>documentation</div> <div>The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.</div>														
id	QIFIdType	required			<div>documentation</div> <div>The required id attribute is the unique model entity identifier.</div>														
annotation	<div>documentation</div> <div>The Curve13BaseType is the abstract base type for all geometric 3D curves (curve(t):R1->R3) present in the CAD scene.</div>																		

complexType **Curve13CoreType**

diagram						
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children	Curve13Core
used by	elements Extrude23CoreType/Curve Ruled23CoreType/Curve Revolution23CoreType/Generatrix
annotation	documentation The Curve13CoreType represents a container for a single 3D curve.

complexType Curve13OrientedType

diagram						
children	Curve13Core					
used by	element ArraySubCurve13Type/SubCurve					
attributes	Name turned	Type xs:boolean	Use	Default 0	Fixed	Annotation documentation The optional turned attribute shows if the Curve13 is inverted. A value of 1 (or true) means the Curve13 is inverted from the Curve13Core. A value of 0 (or false) means the Curve13 is not inverted.
annotation	documentation The Curve13OrientedType defines an oriented Curve13.					

attribute Curve13OrientedType/@turned

type	xs:boolean
properties	default 0

annotation	documentation The optional turned attribute shows if the Curve13 is inverted. A value of 1 (or true) means the Curve13 is inverted from the Curve13Core. A value of 0 (or false) means the Curve13 is not inverted.
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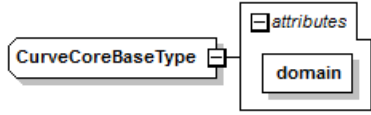
complexType Curve13SetType

diagram						
children	Curve13					
used by	element Curve13Set					
attributes	Name N	Type NaturalType	Use required	Default	Fixed	Annotation documentation The required N attribute is the number of objects in this set.
annotation	documentation The Curve13SetType represents a container for storing all 3D curves present in the CAD scene.					

attribute Curve13SetType/@N

type	NaturalType		
properties	use required		
facets	Kind minInclusive	Value 1	Annotation
annotation	documentation The required N attribute is the number of objects in this set.		

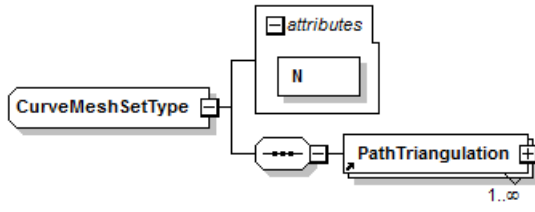
complexType **CurveCoreBaseType**

diagram						
properties	abstract true					
used by	elements Curve12Core Curve13Core complexTypes Aggregate12CoreType Aggregate13CoreType ArcCircular12CoreType ArcCircular13CoreType ArcConic12CoreType ArcConic13CoreType Nurbs12CoreType Nurbs13CoreType Polyline12CoreType Polyline13CoreType Segment12CoreType Segment13CoreType Spline12CoreType Spline13CoreType					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve.
annotation	documentation The CurveCoreBaseType is the abstract base type for all mathematical cores of 2D and 3D curves present in the CAD scene.					

attribute **CurveCoreBaseType/@domain**

type	ParameterRangeType		
properties	use required		
facets	Kind length	Value 2	Annotation
annotation	documentation The required domain attribute is the domain of the parameterization of the curve.		

complexType **CurveMeshSetType**

diagram						
children	PathTriangulation					
used by	element CurveMeshSet					
attributes	Name N	Type NaturalType	Use required	Default	Fixed	Annotation documentation The required N attribute is the number of objects in this set.
annotation	documentation The CurveMeshSetType represents a container for storing all mesh curves present in the CAD scene.					

attribute **CurveMeshSetType/@N**

type	NaturalType		
properties	use	required	
facets	Kind	Value	Annotation
	minInclusive	1	
annotation	documentation The required N attribute is the number of objects in this set.		

complexType **Cylinder23CoreType**

diagram						
type	extension of SurfaceCoreBaseType					
properties	base SurfaceCoreBaseType					
children	Diameter Length Axis Sweep					
used by	element Cylinder23Core					
attributes	Name	Type	Use	Default	Fixed	Annotation
	form	Attr23CoreEnumType				documentation The optional form attribute describes the surface form.
	turnedV	xs:boolean		false		documentation The optional turnedV attribute shows if the u direction of the cylinder must be inverted. A value of 1 (or true) means the v direction must be inverted. A value of 0 (or

	<p>scaleU DoublePositiveType 1.0</p> <p>scaleV DoublePositiveType 1.0</p>	<p>false) means the v direction must not be inverted. documentation The optional scaleU attribute is the scaling coefficient of the u direction of the parametric space. documentation The optional scaleV attribute is the scaling coefficient of the v direction of the parametric space.</p>
annotation	<p>documentation The Cylinder23CoreType defines the mathematical core of the geometric entity 'cylindrical_surface(u,v):R2->R3'.</p>	

attribute Cylinder23CoreType/@turnedV

type	xs:boolean
properties	default false
annotation	<p>documentation The optional turnedV attribute shows if the u direction of the cylinder must be inverted. A value of 1 (or true) means the v direction must be inverted. A value of 0 (or false) means the v direction must not be inverted.</p>

attribute Cylinder23CoreType/@scaleU

type	DoublePositiveType		
properties	default	1.0	
facets	Kind minExclusive	Value 0.0	Annotation
annotation	documentation The optional scaleU attribute is the scaling coefficient of the u direction of the parametric space.		

attribute Cylinder23CoreType/@scaleV


type	DoublePositiveType		
properties	default	1.0	
facets	Kind	Value	Annotation
	minExclusive	0.0	
annotation	documentation The optional scaleV attribute is the scaling coefficient of the v direction of the parametric space.		

element Cylinder23CoreType/Diameter

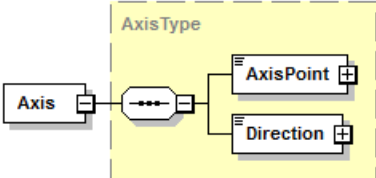
diagram	
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type	xs:double
properties	content simple
annotation	documentation The Diameter element is diameter of the cylinder.

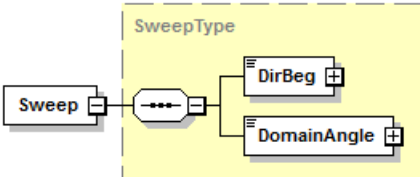
element **Cylinder23CoreType/Length**

diagram	
type	xs:double
properties	content simple
annotation	documentation The Length element is height of the cylinder - distance between the cylinder top and bottom.

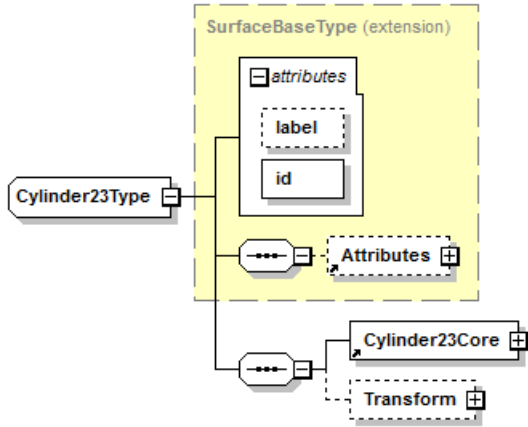
element **Cylinder23CoreType/Axis**

diagram	
type	AxisType
properties	content complex
children	AxisPoint Direction
annotation	documentation The Axis is the unit axis vector of the cylinder.

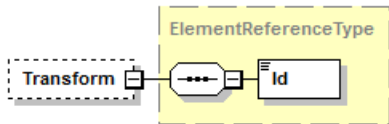
element **Cylinder23CoreType/Sweep**

diagram	
type	SweepType
properties	content complex
children	DirBeg DomainAngle
annotation	documentation The Sweep element gives the start direction and the swept angle for the cylinder. The StartVector of the Sweep must lie in a plane normal to the axis of the cone.

complexType **Cylinder23Type**

diagram						
type	extension of SurfaceBaseType					
properties	base SurfaceBaseType					
children	Attributes Cylinder23Core Transform					
used by	element Cylinder23					
attributes	Name	Type	Use	Default	Fixed	Annotation
	label	xs:string				documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Cylinder23Type defines the geometric entity 'cylindrical_surface(u,v):R2->R3'. Any surface can have an additional transformation matrix. The cylinder is bounded below by a plane passing through the AxisPoint of the axis and normal to the axis. The cylinder is bound above by a plane that (1) passes through a point on the axis a distance Length along the axis from the axis point in the direction of the axis and (2) is normal to the axis.					

element **Cylinder23Type/Transform**

diagram						
type	ElementReferenceType					
properties	minOcc	0				
	maxOcc	1				
	content	complex				
children	Id					
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.					

complexType **Extrude23CoreType**

diagram						
type	extension of SurfaceCoreBaseType					
properties	base SurfaceCoreBaseType					
children	TerminationPoint Curve					
used by	element Extrude23Core					
attributes	Name form	Type Attr23CoreEnumType	Use	Default	Fixed	Annotation documentation The optional form attribute describes the surface form.
annotation	documentation The Extrude23CoreType defines the mathematical core of the geometric entity 'surface_of_extrusion(u,v):R2->R3'. It is built on the profile-curve and the extrusion direction.					

element **Extrude23CoreType/TerminationPoint**

diagram						
type	PointSimpleType					
properties	content simple					
facets	Kind length	Value 3	Annotation			
annotation	documentation The TerminationPoint specifies the termination point. The corresponding start point is located at the profile curve.					

element **Extrude23CoreType/Curve**

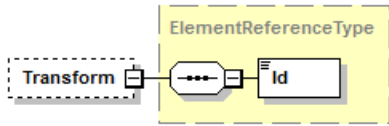
diagram	
type	Curve13CoreType
properties	content complex
children	Curve13Core
annotation	documentation The Curve element is the curve to be used as the profile of extrusion.

complexType **Extrude23Type**

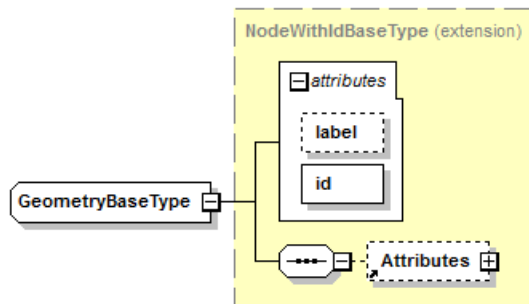
diagram	<p>The diagram illustrates the structure of the Extrude23Type element. It is an extension of the SurfaceBaseType (indicated by a dashed box). The Extrude23Type element has an optional attribute label and a required attribute id. It also has an optional attribute Attributes and an optional attribute Transform. The diagram shows the relationships between these elements and their parent/child types.</p>												
type	extension of SurfaceBaseType												
properties	base SurfaceBaseType												
children	Attributes Extrude23Core Transform												
used by	element Extrude23												
attributes	<table><thead><tr><th>Name</th><th>Type</th><th>Use</th><th>Default</th><th>Fixed</th><th>Annotation</th></tr></thead><tbody><tr><td>label</td><td>xs:string</td><td></td><td></td><td></td><td>documentation The optional label attribute is the model entity "nameplate".</td></tr></tbody></table>	Name	Type	Use	Default	Fixed	Annotation	label	xs:string				documentation The optional label attribute is the model entity "nameplate".
Name	Type	Use	Default	Fixed	Annotation								
label	xs:string				documentation The optional label attribute is the model entity "nameplate".								

	<p>id QIFIdType required</p>	<p>Normally it can be seen at the entity item in the project tree. documentation The required id attribute is the unique model entity identifier.</p>
annotation	<p>documentation The Extrude23Type defines the geometric entity 'surface_of_extrusion(u,v):R2->R3'. Any surface can have an additional transformation matrix.</p>	

element **Extrude23Type/Transform**

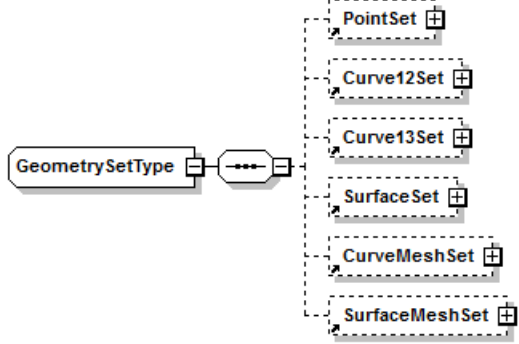
diagram		
type	ElementReferenceType	
properties	minOcc 0 maxOcc 1 content complex	
children	Id	
annotation	<p>documentation The optional Transform element is the identifier of a three dimensional transformation matrix.</p>	

complexType **GeometryBaseType**

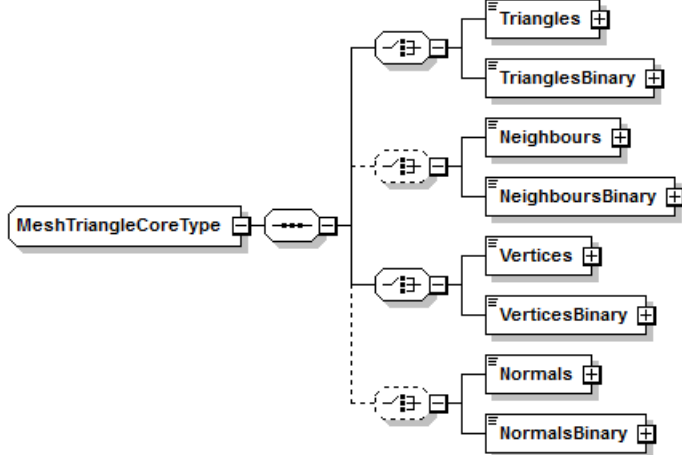
diagram						
type	extension of NodeWithIdBaseType					
properties	base abstract	NodeWithIdBaseType true				
children	Attributes					
used by	complexType	Curve12BaseType Curve13BaseType MeshTriangleType PathTriangulationType PointEntityType SurfaceBaseType				
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item

	id	QIFIdType	required	in the project tree. documentation The required id attribute is the unique model entity identifier.
annotation	documentation	The GeometryBaseType is the abstract base type for all geometric elements.		

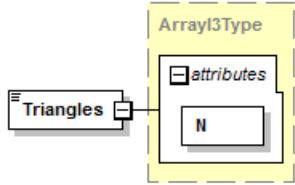
complexType **GeometrySetType**

diagram				
children	PointSet Curve12Set Curve13Set SurfaceSet CurveMeshSet SurfaceMeshSet			
used by	element	GeometrySet		
annotation	documentation	The GeometrySetType describes the main container for storing all geometric entities present in the CAD scene.		

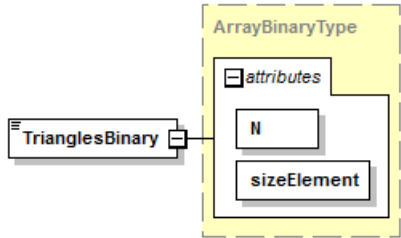
complexType **MeshTriangleCoreType**

diagram				
children	Triangles TrianglesBinary Neighbours NeighboursBinary Vertices VerticesBinary Normals NormalsBinary			
used by	element	MeshTriangleCore		
annotation	documentation	The MeshTriangleCoreType defines the math core of the triangle mesh entity. It contains a set of triangles connected by their common edges.		

element **MeshTriangleCoreType/Triangles**

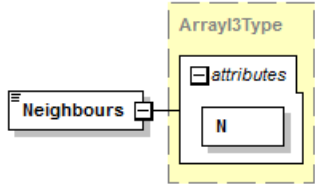
diagram						
type	ArrayI3Type					
properties	content complex					
attributes	Name N	Type xs:positiveInteger	Use required	Default	Fixed	Annotation documentation The required N attribute gives the number of integer triplets represented in the array. The number of entries in the array must be 3*N.
annotation	documentation The Triangles element is an array of indices of the triangle vertices. The number of array elements corresponds to the number of triangles in the mesh. Each element of this array is a triplet of integer numbers: index of the first vertex, index of the second vertex and index of the third vertex. All three vertex indexes of a triangle must be different and must lie in the range [0, ..., number of vertices - 1].					

element **MeshTriangleCoreType/TrianglesBinary**

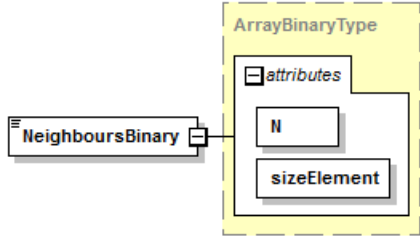
diagram						
type	ArrayBinaryType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many elements are present in this array.
	sizeElement	xs:unsignedInt	required			documentation The required sizeElement attribute shows the size (in bytes) of one element stored in the array. The total size

	of the binary array can be calculated as: $N \times \text{sizeElement}$.
annotation	<p>documentation</p> <p>The TrianglesBinary element is a binary array of indices of the triangle vertices. The number of array elements corresponds to the number of triangles in the mesh. Each element of this array is a triplet of 32-bit integer numbers: index of the first vertex, index of the second vertex and index of the third vertex. All three vertex indexes of a triangle must be different and must lie in the range [0, ..., number of vertices - 1].</p>

element MeshTriangleCoreType/Neighbours

diagram						
type	Array3Type					
properties	content	complex				
attributes	<p>Name</p> <p>N</p>	<p>Type</p> <p>xs:positiveInteger</p>	<p>Use</p> <p>required</p>	<p>Default</p>	<p>Fixed</p>	<p>Annotation</p> <p>documentation</p> <p>The required N attribute gives the number of integer triplets represented in the array. The number of entries in the array must be $3 \times N$.</p>
annotation	<p>documentation</p> <p>The Neighbours element is an array of indices of the triangle neighbors. The number of array elements corresponds to the number of triangles in the mesh. Each element of this array is a triplet of integer numbers: index of a neighbor triangle opposite to the first triangle vertex, index of a neighbor triangle opposite to the second triangle vertex, index of a neighbor triangle opposite to the third triangle vertex. There is a special index value "-1" which shows that there is no neighbor. The neighbor indices must lie in the range [-1,..., number of triangles - 1].</p>					

element MeshTriangleCoreType/NeighboursBinary

diagram						
type	ArrayBinaryType					
properties	content	complex				
attributes	<p>Name</p> <p>N</p>	<p>Type</p> <p>xs:unsignedInt</p>	<p>Use</p> <p>required</p>	<p>Default</p>	<p>Fixed</p>	<p>Annotation</p> <p>documentation</p> <p>The required N attribute shows</p>

	<p>sizeElement xs:unsignedInt required</p>	<p>how many elements are present in this array. documentation The required sizeElement attribute shows the size (in bytes) of one element stored in the array. The total size of the binary array can be calculated as: $N \times \text{sizeElement}$.</p>
annotation	<p>documentation The NeighboursBinary element is a binary array of indices of the triangle neighbors. The number of array elements corresponds to the number of triangles in the mesh. Each element of this array is a triplet of 32-bit integer numbers: index of a neighbor triangle opposite to the first triangle vertex, index of a neighbor triangle opposite to the second triangle vertex, index of a neighbor triangle opposite to the third triangle vertex. There is a special index value "-1" which shows that there is no neighbor. The neighbor indices must lie in the range [-1, ..., number of triangles - 1].</p>	

element **MeshTriangleCoreType/Vertices**

diagram						
type	ArrayPointType					
properties	content	complex				
attributes	Name	Type	Use	Default	Fixed	Annotation

	<p>N xs:positiveInteger required</p> <p>documentation The required N attribute gives the number of points represented by the array. The number of entries in the array must be 3N.</p> <p>linearUnit xs:token</p> <p>decimalPlaces xs:nonNegativeInteger</p> <p>significantFigures xs:nonNegativeInteger</p> <p>validity ValidityEnumType</p> <p>xDecimalPlaces xs:nonNegativeInteger</p> <p>xSignificantFigures xs:nonNegativeInteger</p> <p>xValidity ValidityEnumType</p> <p>yDecimalPlaces xs:nonNegativeInteger</p> <p>ySignificantFigures xs:nonNegativeInteger</p> <p>yValidity ValidityEnumType</p> <p>zDecimalPlaces xs:nonNegativeInteger</p> <p>zSignificantFigures xs:nonNegativeInteger</p> <p>zValidity ValidityEnumType</p>
annotation	<p>documentation The Vertices element is an array of 3D points. The number of array elements corresponds to the number of vertices in the mesh. Each element of this array is a triplet of real numbers: the X-coordinate, the Y-coordinate and the Z-coordinate.</p>

element **MeshTriangleCoreType/VerticesBinary**

diagram						
type	ArrayBinaryType					
properties	content	complex				
attributes	Name	Type	Use	Default	Fixed	Annotation
	N	xs:unsignedInt	required			documentation The required N attribute shows how many elements are present in this array.
	sizeElement	xs:unsignedInt	required			documentation The required sizeElement attribute shows the size (in bytes) of one element stored

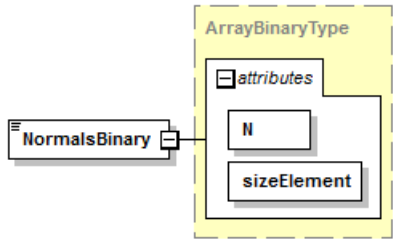
		in the array. The total size of the binary array can be calculated as: $N \times \text{sizeElement}$.
annotation	documentation The VerticesBinary element is a binary array of 3D points. The number of array elements corresponds to the number of vertices in the mesh. Each element of this array is a triplet of real numbers (represented in accordance with the standard IEEE 754-2008): the X-coordinate, the Y-coordinate and the Z-coordinate.	

element **MeshTriangleCoreType/Normals**

diagram						
type	ArrayUnitVectorType					
properties	content complex					
attributes	Name N	Type xs:positiveInteger	Use required	Default	Fixed	Annotation documentation The required N attribute gives the number of unit vectors represented by the array. The number of entries in the array must be 3N.
	linearUnit	xs:token				

	decimalPlaces xs:nonNegativeInteger significantFigures xs:nonNegativeInteger validity ValidityEnumType xDecimalPlaces xs:nonNegativeInteger xSignificantFigures xs:nonNegativeInteger xValidity ValidityEnumType yDecimalPlaces xs:nonNegativeInteger ySignificantFigures xs:nonNegativeInteger yValidity ValidityEnumType zDecimalPlaces xs:nonNegativeInteger zSignificantFigures xs:nonNegativeInteger zValidity ValidityEnumType
annotation	documentation The Normals element is an array of unit vectors. The number of array elements corresponds to the number of vertices in the mesh. Each element of this array is a triplet of real numbers: the X-component, the Y-component and the Z-component.

element **MeshTriangleCoreType/NormalsBinary**

diagram						
type	ArrayBinaryType					
properties	content	complex				
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many elements are present in this array.
	sizeElement	xs:unsignedInt	required			documentation The required sizeElement attribute shows the size (in bytes) of one element stored in the array. The total size of the binary array can be calculated as: N*sizeElement.
annotation	documentation The NormalsBinary element is a binary array of unit vectors. The number of array elements corresponds to the number of vertices in the mesh. Each element of this array is a triplet of real numbers (represented in accordance with the standard IEEE 754-2008): the X-component, the Y-component and the Z-component.					


complexType **MeshTriangleType**

diagram						
type	extension of GeometryBaseType					
properties	base GeometryBaseType					
children	Attributes MeshTriangleCore					
used by	element MeshTriangle					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The MeshTriangleType defines the math core of the triangle mesh entity. It contains a set of triangles connected by their common edges.					

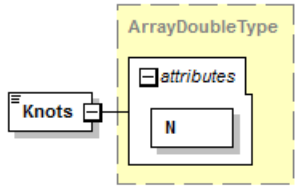
complexType **Nurbs12CoreType**

diagram						
type	extension of CurveCoreBaseType					
properties	base CurveCoreBaseType					
children	Order Knots CPs CPsBinary Weights					
used by	element Nurbs12Core					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve.
annotation	documentation The Nurbs12CoreType defines the mathematical core of the geometric entity 'NURBS_curve(t):R1->R2'. A NURBS curve is built on B-spline basis functions and defined by its order (= degree + 1), a knot vector, and an array of control points with an optional set of associated weights. If the weights are not defined or equal, the curve is a polynomial one (otherwise rational).					

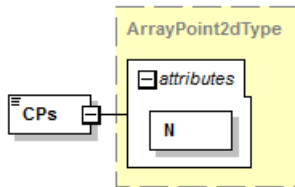
element **Nurbs12CoreType/Order**

diagram							
type	NaturalType						
properties	content simple						
facets	<table><tr><td>Kind</td><td>Value</td><td>Annotation</td></tr><tr><td>minInclusive</td><td>1</td><td></td></tr></table>	Kind	Value	Annotation	minInclusive	1	
Kind	Value	Annotation					
minInclusive	1						
annotation	<p>documentation</p> <p>The Order element is the order (= degree + 1).</p>						

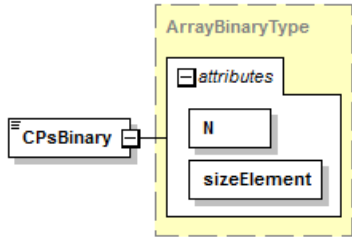
element **Nurbs12CoreType/Knots**

diagram						
type	ArrayDoubleType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The Knots element is the knot vector - an increasing sequence of real numbers which divides the parametric space in the spans. The size of the knot vector is 'number of control points' + 'order'.					

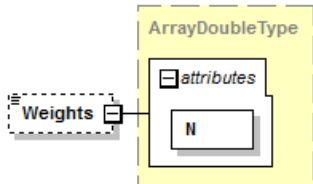
element **Nurbs12CoreType/CPs**

diagram						
type	ArrayPoint2dType					
properties	content complex					
attributes	Name N	Type xs:positiveInteger	Use required	Default	Fixed	Annotation documentation The required N attribute gives the number of points represented by the array. The number of entries in the array must be 2N.
annotation	documentation The CPs element is an array of 2D control points.					

element **Nurbs12CoreType/CPsBinary**

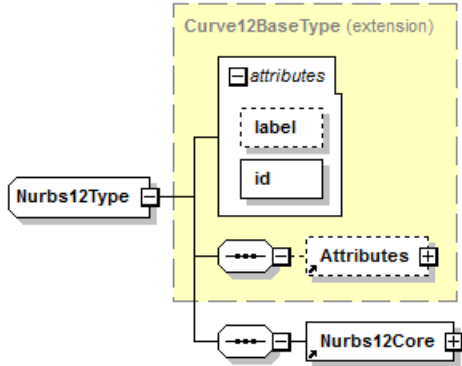
diagram						
type	ArrayBinaryType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many elements are present in this array.
	sizeElement	xs:unsignedInt	required			documentation The required sizeElement attribute shows the size (in bytes) of one element stored in the array. The total size of the binary array can be calculated as: N*sizeElement.
annotation	documentation The CPsBinary element is a binary array of 2D control points.					

element **Nurbs12CoreType/Weights**

diagram						
type	ArrayDoubleType					
properties	minOcc 0 maxOcc 1 content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The optional Weights element is an array of control point weights (positive real numbers). This array can be absent if the NURBS curve is a polynomial one. If this array is present, then the number of its elements corresponds to the number of					

	control points.
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
complexType Nurbs12Type

diagram						
type	extension of Curve12BaseType					
properties	base Curve12BaseType					
children	Attributes Nurbs12Core					
used by	element Nurbs12					
attributes	Name	Type	Use	Default	Fixed	Annotation
	label	xs:string				documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Nurbs12Type defines the geometric entity 'NURBS_curve(t):R1->R2'. The 2D curves are normally used to define a trimming curve in the parametric space of a surface.					

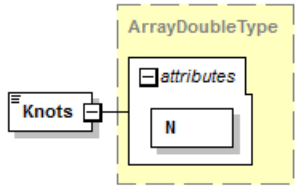
complexType **Nurbs13CoreType**

diagram						
type	extension of CurveCoreBaseType					
properties	base CurveCoreBaseType					
children	Order Knots CPs CPsBinary Weights					
used by	element Nurbs13Core					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve.
annotation	documentation The Nurbs13CoreType defines the mathematical core of the geometric entity 'NURBS_curve(t):R1->R3'. A NURBS curve is built on B-spline basis functions and defined by its order (= degree + 1), a knot vector, and an array of control points with an optional set of associated weights. If the weights are not defined or equal, the curve is a polynomial one (otherwise rational).					

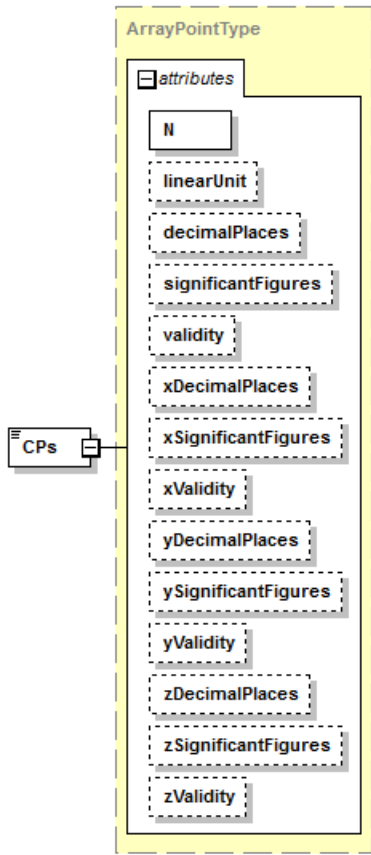
element **Nurbs13CoreType/Order**

diagram							
type	NaturalType						
properties	content simple						
facets	<table><tr><td>Kind</td><td>Value</td><td>Annotation</td></tr><tr><td>minInclusive</td><td>1</td><td></td></tr></table>	Kind	Value	Annotation	minInclusive	1	
Kind	Value	Annotation					
minInclusive	1						
annotation	<p>documentation</p> <p>The Order element is the order (= degree + 1).</p>						

element **Nurbs13CoreType/Knots**

diagram						
type	ArrayDoubleType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The Knots element is the knot vector - an increasing sequence of real numbers which divides the parametric space in the spans. The size of the knot vector is 'number of control points' + 'order'.					

element **Nurbs13CoreType/CPs**

diagram						
type	ArrayPointType					

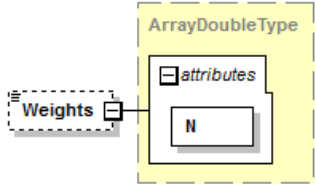
properties	content	complex				
attributes	<div> <div>Name</div> <div>N</div> </div> <div> <div>linearUnit</div> <div>xs:token</div> </div> <div> <div>decimalPlaces</div> <div>xs:nonNegativeInteger</div> </div> <div> <div>significantFigures</div> <div>xs:nonNegativeInteger</div> </div> <div> <div>validity</div> <div>ValidityEnumType</div> </div> <div> <div>xDecimalPlaces</div> <div>xs:nonNegativeInteger</div> </div> <div> <div>xSignificantFigures</div> <div>xs:nonNegativeInteger</div> </div> <div> <div>xValidity</div> <div>ValidityEnumType</div> </div> <div> <div>yDecimalPlaces</div> <div>xs:nonNegativeInteger</div> </div> <div> <div>ySignificantFigures</div> <div>xs:nonNegativeInteger</div> </div> <div> <div>yValidity</div> <div>ValidityEnumType</div> </div> <div> <div>zDecimalPlaces</div> <div>xs:nonNegativeInteger</div> </div> <div> <div>zSignificantFigures</div> <div>xs:nonNegativeInteger</div> </div> <div> <div>zValidity</div> <div>ValidityEnumType</div> </div>	<div> <div>Type</div> <div>xs:positiveInteger</div> </div>	<div> <div>Use</div> <div>required</div> </div>	<div> <div>Default</div> </div>	<div> <div>Fixed</div> </div>	<div> <div>Annotation</div> <div>documentation</div> <div>The required N attribute gives the number of points represented by the array. The number of entries in the array must be 3N.</div> </div>
annotation	<div> <div>documentation</div> <div>The CPs element is an array of 3D control points.</div> </div>					

element Nurbs13CoreType/CPsBinary

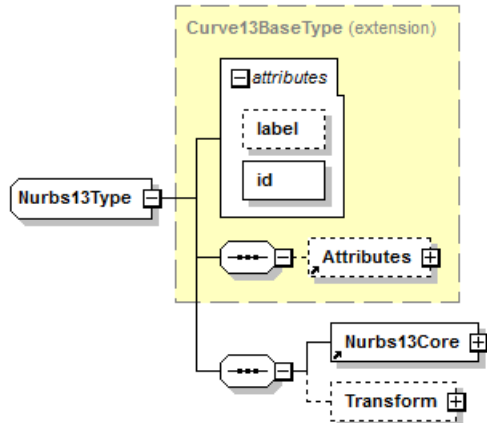
diagram						
type	ArrayBinaryType					
properties	content	complex				
attributes	<div> <div>Name</div> <div>N</div> </div> <div> <div>sizeElement</div> </div>	<div> <div>Type</div> <div>xs:unsignedInt</div> </div> <div> <div>xs:unsignedInt</div> </div>	<div> <div>Use</div> <div>required</div> </div> <div> <div>required</div> </div>	<div> <div>Default</div> </div>	<div> <div>Fixed</div> </div>	<div> <div>Annotation</div> <div>documentation</div> <div>The required N attribute shows how many elements are present in this array.</div> <div>documentation</div> <div>The required sizeElement attribute shows the size (in bytes) of one</div> </div>

		element stored in the array. The total size of the binary array can be calculated as: $N \times \text{sizeElement}$.
annotation	documentation The CPsBinary element is a binary array of 3D control points.	

element **Nurbs13CoreType/Weights**

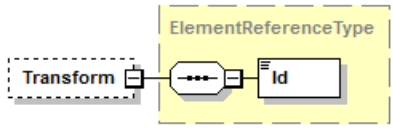
diagram						
type	ArrayDoubleType					
properties	minOcc	0	maxOcc	1	content	complex
attributes	Name	Type	Use	Default	Fixed	Annotation
	N	xs:unsignedInt	required			documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The optional Weights element is an array of control point weights (positive real numbers). This array can be absent if the NURBS curve is a polynomial one. If this array is present, then the number of its elements corresponds to the number of control points.					

complexType **Nurbs13Type**

diagram	
type	extension of Curve13BaseType
properties	base Curve13BaseType
children	Attributes Nurbs13Core Transform

used by	element Nurbs13					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Nurbs13Type defines the geometric entity 'NURBS_curve(t):R1->R3'. Any 3D geometry can have an additional transformation matrix.					


element **Nurbs13Type/Transform**

diagram						
type	ElementReferenceType					
properties	minOcc	0	maxOcc	1	content	complex
children	Id					
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.					

complexType **Nurbs23CoreType**

diagram						
type	extension of SurfaceCoreBaseType					
properties	base SurfaceCoreBaseType					
children	OrderU OrderV KnotsU KnotsV CPs CPsBinary Weights					
used by	element Nurbs23Core					
attributes	Name form	Type Attr23CoreEnumType	Use	Default	Fixed	Annotation documentation The optional form attribute describes the surface form.
annotation	documentation The Nurbs23CoreType defines the mathematical core of the geometric entity 'NURBS_surface(u,v):R2->R3'.					

element **Nurbs23CoreType/OrderU**

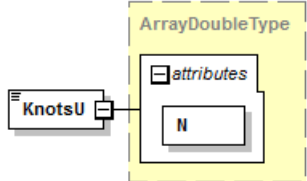
diagram			
type	NaturalType		
properties	content simple		
facets	Kind minInclusive	Value 1	Annotation
annotation	documentation The OrderU element is the order in the u direction (= degree + 1).		

element **Nurbs23CoreType/OrderV**

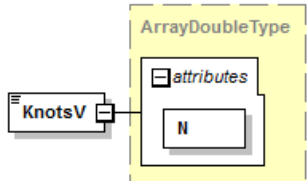
diagram						
type	NaturalType					

properties	content simple		
facets	Kind minInclusive	Value 1	Annotation
annotation	documentation The OrderU element is the order in the v direction (= degree + 1).		

element Nurbs23CoreType/KnotsU

diagram						
type	ArrayDoubleType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The KnotsU element is the knot vector in the u direction. The size of the knot vector is 'number of control points in the u direction' + 'order in the u direction'.					

element Nurbs23CoreType/KnotsV

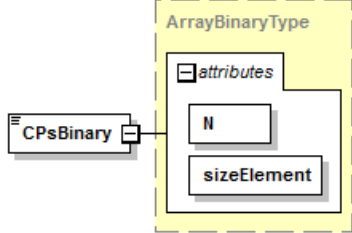
diagram						
type	ArrayDoubleType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The KnotsV element is the knot vector in the v direction. The size of the knot vector is 'number of control points in the v direction' + 'order in the v direction'.					

element **Nurbs23CoreType/CPs**

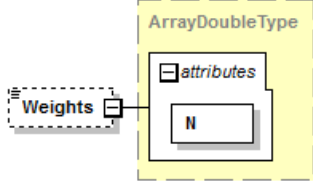
diagram																																																																																																
type	ArrayPointType																																																																																															
properties	content complex																																																																																															
attributes	<table><tr><th>Name</th><th>Type</th><th>Use</th><th>Default</th><th>Fixed</th><th>Annotation</th></tr><tr><td>N</td><td>xs:positiveInteger</td><td>required</td><td></td><td></td><td>documentation The required N attribute gives the number of points represented by the array. The number of entries in the array must be 3N.</td></tr><tr><td>linearUnit</td><td>xs:token</td><td></td><td></td><td></td><td></td></tr><tr><td>decimalPlaces</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>significantFigures</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>validity</td><td>ValidityEnumType</td><td></td><td></td><td></td><td></td></tr><tr><td>xDecimalPlaces</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>xSignificantFigures</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>xValidity</td><td>ValidityEnumType</td><td></td><td></td><td></td><td></td></tr><tr><td>yDecimalPlaces</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>ySignificantFigures</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>yValidity</td><td>ValidityEnumType</td><td></td><td></td><td></td><td></td></tr><tr><td>zDecimalPlaces</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>zSignificantFigures</td><td></td><td></td><td></td><td></td><td></td></tr><tr><td>zValidity</td><td></td><td></td><td></td><td></td><td></td></tr></table>	Name	Type	Use	Default	Fixed	Annotation	N	xs:positiveInteger	required			documentation The required N attribute gives the number of points represented by the array. The number of entries in the array must be 3N.	linearUnit	xs:token					decimalPlaces	xs:nonNegativeInteger					significantFigures	xs:nonNegativeInteger					validity	ValidityEnumType					xDecimalPlaces	xs:nonNegativeInteger					xSignificantFigures	xs:nonNegativeInteger					xValidity	ValidityEnumType					yDecimalPlaces	xs:nonNegativeInteger					ySignificantFigures	xs:nonNegativeInteger					yValidity	ValidityEnumType					zDecimalPlaces						zSignificantFigures						zValidity										
Name	Type	Use	Default	Fixed	Annotation																																																																																											
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zValidity																																																																																																

	zDecimalPlaces xs:nonNegativeInteger zSignificantFigures xs:nonNegativeInteger zValidity ValidityEnumType
annotation	documentation The CPs element is an array of control points.

element **Nurbs23CoreType/CPsBinary**

diagram						
type	ArrayBinaryType					
properties	content complex					
attributes	Name	Type	Use	Default	Fixed	Annotation
	N	xs:unsignedInt	required			documentation The required N attribute shows how many elements are present in this array.
	sizeElement	xs:unsignedInt	required			documentation The required sizeElement attribute shows the size (in bytes) of one element stored in the array. The total size of the binary array can be calculated as: N*sizeElement.
annotation	documentation The CPsBinary element is a binary array of control points.					

element **Nurbs23CoreType/Weights**

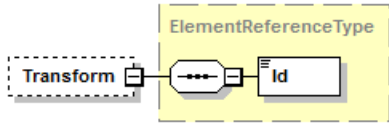
diagram						
type	ArrayDoubleType					
properties	minOcc	0				
	maxOcc	1				
	content	complex				
attributes	Name	Type	Use	Default	Fixed	Annotation

	N	xs:unsignedInt	required	documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The optional Weights element is an array of control point weights. This array can be absent if the NURBS surface is a polynomial one. If this array is present then the number of its elements corresponds to the number of control points.			

complexType **Nurbs23Type**

diagram						
type	extension of SurfaceBaseType					
properties	base SurfaceBaseType					
children	Attributes Nurbs23Core Transform					
used by	element Nurbs23					
attributes	Name	Type	Use	Default	Fixed	Annotation
	label	xs:string				documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Nurbs23Type defines the geometric entity 'NURBS_surface(u,v):R2->R3'. Any surface can have an additional transformation matrix.					

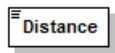
element **Nurbs23Type/Transform**

diagram	
type	ElementReferenceType
properties	minOcc 0 maxOcc 1 content complex
children	Id
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.

complexType **Offset23CoreType**

diagram						
type	extension of SurfaceCoreBaseType					
properties	base SurfaceCoreBaseType					
children	Distance Surface					
used by	element Offset23Core					
attributes	Name form	Type Attr23CoreEnumType	Use	Default	Fixed	Annotation documentation The optional form attribute describes the surface form.
annotation	documentation The Offset23CoreType defines the mathematical core of the geometric entity 'offset_surface(u,v):R2->R3'. The offset surface is built on an existing surface by moving every surface point in the normal direction on an offset distance.					

element **Offset23CoreType/Distance**

diagram	
type	xs:double
properties	content simple
annotation	documentation The Distance element is the offset distance.

element **Offset23CoreType/Surface**

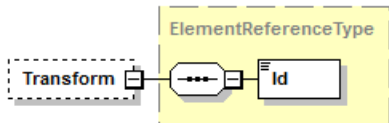
diagram	
type	SurfaceCoreType
properties	content complex
children	SurfaceCore
used by	complexType SurfaceSetType
annotation	documentation The Surface element is the base surface for the offsetting.

complexType **Offset23Type**

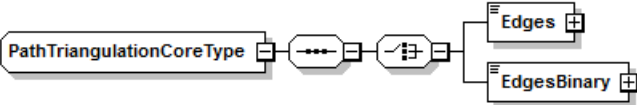
diagram	
type	extension of SurfaceBaseType

properties	base SurfaceBaseType					
children	Attributes Offset23Core Transform					
used by	element Offset23					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Offset23Type defines the geometric entity 'offset_surface(u,v):R2->R3'. Any surface can have an additional transformation matrix.					

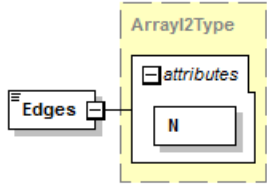
element **Offset23Type/Transform**

diagram						
type	ElementReferenceType					
properties	minOcc	0	maxOcc	1	content	complex
children	Id					
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.					

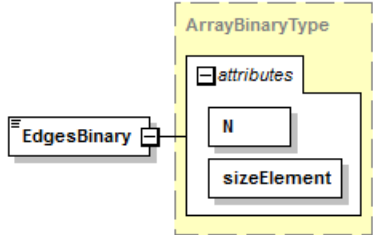
complexType **PathTriangulationCoreType**

diagram	
children	Edges EdgesBinary
used by	element PathTriangulationCore
annotation	documentation The PathTriangulationCoreType defines the mathematical core of the triangulation path (a polyline formed from the triangle edges).

element **PathTriangulationCoreType/Edges**

diagram						
type	Array12Type					
properties	content complex					
attributes	Name N	Type xs:positiveInteger	Use required	Default	Fixed	Annotation documentation The required N attribute gives the number of integer pairs represented in the array. The number of entries in the array must be 2*N.
annotation	documentation The Edges element is an array of triangle edges which form a triangulation path. This is an array of pairs of positive integers, where the first value is a triangle index and the second value is a vertex index opposite to the edge.					

element **PathTriangulationCoreType/EdgesBinary**

diagram						
type	ArrayBinaryType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many elements are present in this array.
	sizeElement	xs:unsignedInt	required			documentation The required sizeElement attribute shows the size (in bytes) of one element stored in the array. The total size of the binary array can be

	calculated as: N*sizeElement.
annotation	documentation The EdgesBinary element is a binary array of triangle edges which form a triangulation path. This is an array of pairs of positive integers, where the first value is a triangle index and the second value is a vertex index opposite to the edge.

complexType PathTriangulationType

diagram						
type	extension of GeometryBaseType					
properties	base GeometryBaseType					
children	Attributes PathTriangulationCore MeshTriangle					
used by	element PathTriangulation					
attributes	Name	Type	Use	Default	Fixed	Annotation
	label	xs:string				documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The PathTriangulationType defines a triangulation path (polylines formed from the triangle edges).					

element PathTriangulationType/MeshTriangle

diagram						
type	ElementReferenceType					
properties	content complex					

children	Id
used by	complexType SurfaceMeshSetType
annotation	documentation The MeshTriangle element is the identifier of a triangle mesh.

complexType Plane23CoreType

diagram						
type	extension of SurfaceCoreBaseType					
properties	base SurfaceCoreBaseType					
children	Origin DirU DirV					
used by	element Plane23Core					
attributes	Name form	Type Attr23CoreEnumType	Use	Default	Fixed	Annotation documentation The optional form attribute describes the surface form. documentation The required domainU attribute gives the parameter domain in the U-direction. documentation The required domainV attribute gives the parameter domain in the V-direction.
	domainU	ParameterRangeType	required			
	domainV	ParameterRangeType	required			
annotation	documentation The Plane23CoreType defines the mathematical core of the geometric entity 'plane_surface(u,v):R2->R3'. Plane is an infinite flat surface. The parametrization of the plane is defined by two vectors: DirU and DirV. The domain values (domainU and domainV) 'limit' the plane infinity.					


attribute **Plane23CoreType/@domainU**

type	ParameterRangeType		
properties	use	required	
facets	Kind	Value	Annotation
	length	2	
annotation	documentation The required domainU attribute gives the parameter domain in the U-direction.		


attribute **Plane23CoreType/@domainV**

type	ParameterRangeType		
properties	use	required	
facets	Kind	Value	Annotation
	length	2	
annotation	documentation The required domainV attribute gives the parameter domain in the V-direction.		


element **Plane23CoreType/Origin**

diagram			
type	PointSimpleType		
properties	content	simple	
facets	Kind	Value	Annotation
	length	3	
annotation	documentation The Origin element gives one corner of the parallelogram.		

element **Plane23CoreType/DirU**

diagram			
type	VectorSimpleType		
properties	content	simple	
facets	Kind	Value	Annotation
	length	3	
annotation	documentation The DirU element is a vector that defines the direction and scaling of U-parameter lines. The DirU vector must not be parallel or anti-parallel to the DirV vector.		

element **Plane23CoreType/DirV**

diagram			
type	VectorSimpleType		
properties	content	simple	
facets	Kind	Value	Annotation
	length	3	

annotation	documentation The DirV element is a vector that defines the direction and scaling of V-parameter lines.
------------	--

complexType **Plane23Type**

diagram						
type	extension of SurfaceBaseType					
properties	base SurfaceBaseType					
children	Attributes Plane23Core Transform					
used by	element Plane23					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Plane23Type defines the geometric entity 'planar_surface(u,v):R2->R3'. Any surface can have an additional transformation matrix.					

element **Plane23Type/Transform**


diagram						
type	ElementReferenceType					
properties	minOcc	0	maxOcc	1	content	complex

children	Id
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.

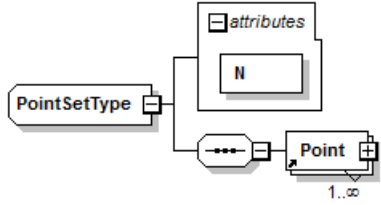
complexType **PointEntityType**

diagram						
type	extension of GeometryBaseType					
properties	base GeometryBaseType					
children	Attributes XYZ					
used by	element Point					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree. documentation The required id attribute is the unique model entity identifier.
	id	QIFIdType	required			
annotation	documentation The PointEntityType is a geometric entity that is a 3D point. It is normally used as underlying geometry for vertices.					

element **PointEntityType/XYZ**

diagram			
type	PointSimpleType		
properties	content	simple	
facets	Kind length	Value 3	Annotation
annotation	documentation The XYZ element is the Cartesian three-dimensional coordinates of the 3D point.		

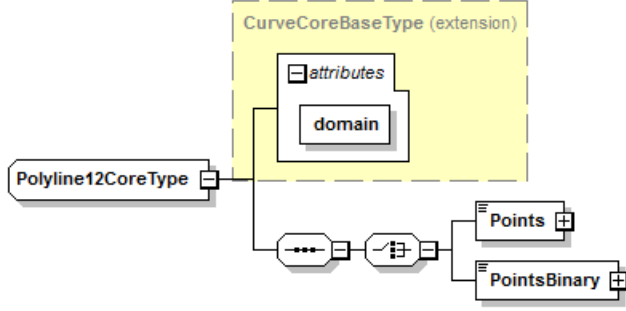
complexType **PointSetType**

diagram						
children	Point					
used by	element PointSet					
attributes	Name N	Type NaturalType	Use required	Default	Fixed	Annotation documentation The required N attribute is the number of objects in this set.
annotation	documentation The PointSetType represents a container for storing all instances of PointEntityType present in the CAD scene.					

attribute **PointSetType/@N**

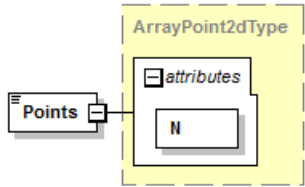
type	NaturalType		
properties	use required		
facets	Kind minInclusive	Value 1	Annotation
annotation	documentation The required N attribute is the number of objects in this set.		

complexType **Polyline12CoreType**

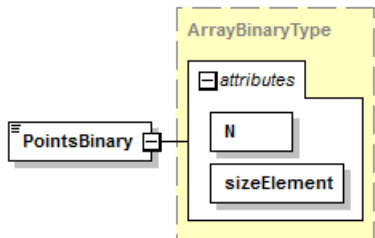
diagram						
type	extension of CurveCoreBaseType					
properties	base CurveCoreBaseType					
children	Points PointsBinary					
used by	element Polyline12Core					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the

	parameterization of the curve.
annotation	documentation The Polyline12CoreType defines the mathematical core of the geometric entity 'polyline(t):R1->R2'. The polyline is a series of connected linear segments.

element **Polyline12CoreType/Points**

diagram						
type	ArrayPoint2dType					
properties	content	complex				
attributes	Name N	Type xs:positiveInteger	Use required	Default	Fixed	Annotation documentation The required N attribute gives the number of points represented by the array. The number of entries in the array must be 2N.
annotation	documentation The Points element is an array of 2D polyline points.					

element **Polyline12CoreType/PointsBinary**

diagram						
type	ArrayBinaryType					
properties	content	complex				
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many elements are present in this array. documentation The required sizeElement attribute shows
	sizeElement	xs:unsignedInt	required			

		the size (in bytes) of one element stored in the array. The total size of the binary array can be calculated as: $N \times \text{sizeElement}$.
annotation	documentation The PointsBinary element is a binary array of 2D polyline points.	

complexType Polyline12Type

diagram						
type	extension of Curve12BaseType					
properties	base Curve12BaseType					
children	Attributes Polyline12Core					
used by	element Polyline12					
attributes	Name	Type	Use	Default	Fixed	Annotation
	label	xs:string				documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Polyline12Type defines the geometric entity 'polyline(t):R1->R2'. The Polyline12Type is a 2D curve normally used to define a trimming curve in the parametric space of a surface.					

complexType **Polyline13CoreType**

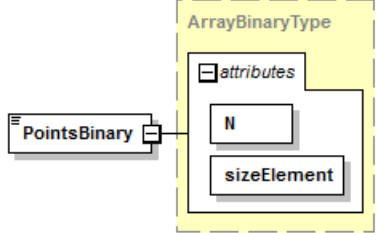
diagram	<pre> classDiagram class Polyline13CoreType { domain } class CurveCoreBaseType { attributes } class Points class PointsBinary Polyline13CoreType -- > CurveCoreBaseType Polyline13CoreType -- Points Polyline13CoreType -- PointsBinary </pre>					
type	extension of CurveCoreBaseType					
properties	base CurveCoreBaseType					
children	Points PointsBinary					
used by	element Polyline13Core					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve.
annotation	documentation The Polyline13CoreType defines the mathematical core of the geometric entity 'polyline(t):R1->R3'. The polyline is a series of connected linear segments.					

element **Polyline13CoreType/Points**

diagram																																																																															
type	ArrayPointType																																																																														
properties	content	complex																																																																													
attributes	<table><tr><th>Name</th><th>Type</th><th>Use</th><th>Default</th><th>Fixed</th><th>Annotation</th></tr><tr><td>N</td><td>xs:positiveInteger</td><td>required</td><td></td><td></td><td>documentation The required N attribute gives the number of points represented by the array. The number of entries in the array must be 3N.</td></tr><tr><td>linearUnit</td><td>xs:token</td><td></td><td></td><td></td><td></td></tr><tr><td>decimalPlaces</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>significantFigures</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>validity</td><td>ValidityEnumType</td><td></td><td></td><td></td><td></td></tr><tr><td>xDecimalPlaces</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>xSignificantFigures</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>xValidity</td><td>ValidityEnumType</td><td></td><td></td><td></td><td></td></tr><tr><td>yDecimalPlaces</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>ySignificantFigures</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>yValidity</td><td>ValidityEnumType</td><td></td><td></td><td></td><td></td></tr></table>	Name	Type	Use	Default	Fixed	Annotation	N	xs:positiveInteger	required			documentation The required N attribute gives the number of points represented by the array. The number of entries in the array must be 3N.	linearUnit	xs:token					decimalPlaces	xs:nonNegativeInteger					significantFigures	xs:nonNegativeInteger					validity	ValidityEnumType					xDecimalPlaces	xs:nonNegativeInteger					xSignificantFigures	xs:nonNegativeInteger					xValidity	ValidityEnumType					yDecimalPlaces	xs:nonNegativeInteger					ySignificantFigures	xs:nonNegativeInteger					yValidity	ValidityEnumType										
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ySignificantFigures	xs:nonNegativeInteger																																																																														
yValidity	ValidityEnumType																																																																														

	zDecimalPlaces xs:nonNegativeInteger zSignificantFigures xs:nonNegativeInteger zValidity ValidityEnumType
annotation	documentation The Points element is an array of 3D polyline points.

element **Polyline13CoreType/PointsBinary**

diagram						
type	ArrayBinaryType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many elements are present in this array. documentation The required sizeElement attribute shows the size (in bytes) of one element stored in the array. The total size of the binary array can be calculated as: N*sizeElement.
	sizeElement	xs:unsignedInt	required			
annotation	documentation The PointsBinary element is a binary array of 3D polyline points.					

complexType **Polyline13Type**

diagram						
type	extension of Curve13BaseType					
properties	base Curve13BaseType					
children	Attributes Polyline13Core Transform					
used by	element Polyline13					
attributes	Name	Type	Use	Default	Fixed	Annotation
	label	xs:string				documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Polyline13Type defines the geometric entity 'polyline(t):R1->R3'. Any 3D geometry can have an additional transformation matrix.					

element **Polyline13Type/Transform**

diagram	<p>The diagram illustrates the structure of the ElementReferenceType. It features a dashed rectangular container. Inside, on the left, is a box labeled 'Transform' with a dashed border. To its right is a box labeled 'Id' with a solid border. A solid line connects the right side of the 'Transform' box to the left side of the 'Id' box. This line has a small open circle at the 'Transform' end and a small open square at the 'Id' end. The entire assembly is enclosed in a larger dashed rectangle with the label 'ElementReferenceType' at the top.</p>
type	ElementReferenceType
properties	<div>minOcc0</div> <div>maxOcc1</div> <div>contentcomplex</div>
children	Id
annotation	<div>documentation</div> <div>The optional Transform element is the identifier of a three dimensional transformation matrix.</div>

complexType **Revolution23CoreType**

diagram						
type	extension of SurfaceCoreBaseType					
properties	base SurfaceCoreBaseType					
children	Axis Generatrix					
used by	element Revolution23Core					
attributes	Name	Type	Use	Default	Fixed	Annotation
	form	Attr23CoreEnumType				documentation The optional form attribute describes the surface form.
	angle	ParameterRangeType	required			documentation The required angle attribute specifies start and terminate rotation angles.
annotation	documentation The Revolution23CoreType defines the mathematical core of the geometric entity 'surface_of_revolution(u,v):R2->R3'.					

attribute **Revolution23CoreType/@angle**

type	ParameterRangeType		
properties	use required		
facets	Kind	Value	Annotation
	length	2	
annotation	documentation The required angle attribute specifies start and terminate rotation angles.		

element **Revolution23CoreType/Axis**

diagram			
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type	AxisType
properties	content complex
children	AxisPoint Direction
annotation	documentation The Axis is the unit axis vector of rotation.

element **Revolution23CoreType/Generatrix**

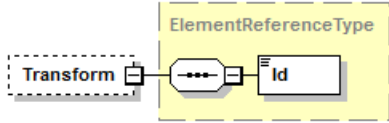
diagram	
type	Curve13CoreType
properties	content complex
children	Curve13Core
annotation	documentation The Generatrix element is the 3D curve to be rotated around the axis.

complexType **Revolution23Type**

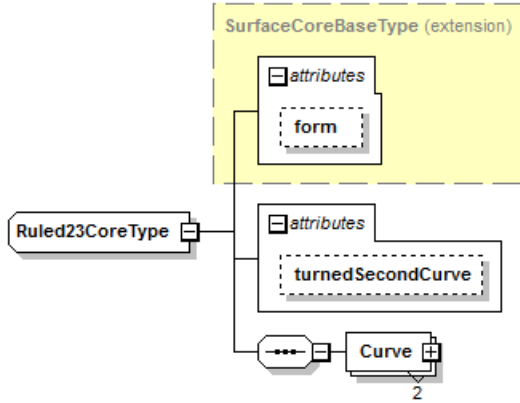
diagram	
type	extension of SurfaceBaseType
properties	base SurfaceBaseType

children	Attributes Revolution23Core Transform					
used by	element Revolution23					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree. documentation The required id attribute is the unique model entity identifier.
	id	QIFIdType	required			
annotation	documentation The Revolution23Type defines the geometric entity 'surface_of_revolution(u,v):R2->R3'. Any surface can have an additional transformation matrix.					

element **Revolution23Type/Transform**

diagram						
type	ElementReferenceType					
properties	minOcc	0	maxOcc	1	content	complex
children	Id					
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.					

complexType **Ruled23CoreType**

diagram						
type	extension of SurfaceCoreBaseType					
properties	base	SurfaceCoreBaseType				

children	Curve					
used by	element Ruled23Core					
attributes	Name form	Type Attr23CoreEnumType	Use	Default	Fixed	Annotation documentation The optional form attribute describes the surface form. documentation The optional turnedSecondCurve attribute shows if the second curve is inverted. A value of 1 (or true) means the second curve is inverted. A value of 0 (or false) means the second curve is not inverted.
	turnedSecondCurve	xs:boolean		0		
annotation	documentation The Ruled23CoreType defines the mathematical core of the geometric entity 'ruled_surface(u,v):R2->R3'. The rule surface is a surface generated by connecting corresponding points on two space curves by a set of linear segments.					

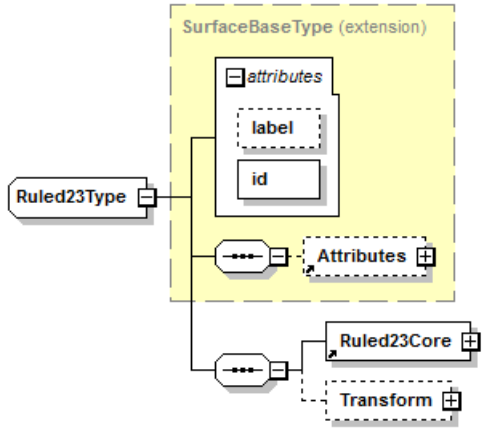
attribute **Ruled23CoreType/@turnedSecondCurve**

type	xs:boolean
properties	default 0
annotation	documentation The optional turnedSecondCurve attribute shows if the second curve is inverted. A value of 1 (or true) means the second curve is inverted. A value of 0 (or false) means the second curve is not inverted.

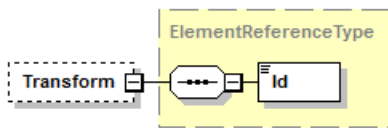
element **Ruled23CoreType/Curve**

diagram	<pre>graph LR Curve[Curve] -- 2 --> Curve13CoreType subgraph Curve13CoreType [Curve13CoreType] Curve13Core[Curve13Core] Aggregate13Core[Aggregate13Core] ArcCircular13Core[ArcCircular13Core] ArcConic13Core[ArcConic13Core] Nurbs13Core[Nurbs13Core] Polyline13Core[Polyline13Core] Segment13Core[Segment13Core] Spline13Core[Spline13Core] end Curve13CoreType --> Curve13Core</pre>
type	Curve13CoreType
properties	minOcc 2 maxOcc 2 content complex
children	Curve13Core

complexType **Ruled23Type**

diagram							
type	extension of SurfaceBaseType						
properties	base <code>SurfaceBaseType</code>						
children	Attributes Ruled23Core Transform						
used by	element Ruled23						
attributes	Name	Type	Use	Name	Default	Fixed	Annotation
	label	xs:string					documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required				documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Ruled23Type defines the geometric entity 'ruled_surface(u,v):R2->R3'. Any surface can have an additional transformation matrix.						

element **Ruled23Type/Transform**

diagram							
type	ElementReferenceType						
properties	minOcc	0					
	maxOcc	1					
	content	complex					
children	Id						

annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.
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complexType Segment12CoreType

diagram						
type	extension of CurveCoreBaseType					
properties	base CurveCoreBaseType					
children	StartPoint EndPoint					
used by	element Segment12Core					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve.
annotation	documentation The Segment12CoreType defines the mathematical core of the geometric entity 'linear_segment(t):R1->R2'. It represents a portion of a 2D line defined and bounded by a start point and an end point.					

complexType Segment12Type

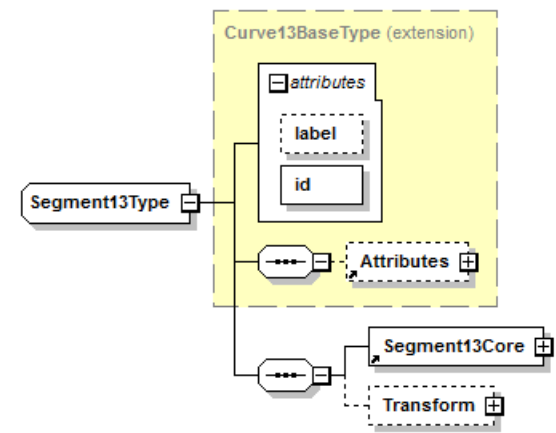
diagram						
type	extension of Curve12BaseType					
properties	base Curve12BaseType					
children	Attributes Segment12Core					
used by	element Segment12					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional

	<p>id QIFIdType required</p>	<p>label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.</p> <p>documentation The required id attribute is the unique model entity identifier.</p>
annotation	<p>documentation The Segment12Type defines the geometric entity 'linear_segment(t):R1->R2'. The 2D curves are normally used to define a trimming curve in the parametric space of a surface.</p>	

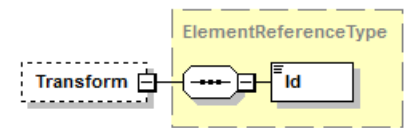
complexType **Segment13CoreType**

diagram	<p>The diagram illustrates the structure of Segment13CoreType. It is an extension of CurveCoreBaseType, which contains an attributes container with a domain attribute. Segment13CoreType is connected to a LineSegmentGroup, which in turn is connected to StartPoint and EndPoint.</p>					
type	extension of CurveCoreBaseType					
properties	base CurveCoreBaseType					
children	StartPoint EndPoint					
used by	element Segment13Core					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve.
annotation	<p>documentation The Segment13CoreType defines the mathematical core of the geometric entity 'linear_segment(t):R1->R3'. It represents a portion of a 3D line defined and bounded by a start point and an end point.</p>					

complexType **Segment13Type**

diagram						
type	extension of Curve13BaseType					
properties	base Curve13BaseType					
children	Attributes Segment13Core Transform					
used by	element Segment13					
attributes	Name	Type	Use	Default	Fixed	Annotation
	label	xs:string				documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Segment13Type defines the geometric entity 'linear_segment(t):R1->R3'. Any 3D geometry can have an additional transformation matrix.					

element **Segment13Type/Transform**

diagram						
type	ElementReferenceType					
properties	minOcc	0	maxOcc	1	content	complex
children	Id					
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.					

complexType **Sphere23CoreType**

diagram	<pre> classDiagram class SurfaceCoreBaseType { +form +turnedV } class Sphere23CoreType { +scaleU +scaleV +Diameter +Location +LatitudeLongitudeSweep } SurfaceCoreBaseType < -- Sphere23CoreType Sphere23CoreType -- > SurfaceCoreBaseType Sphere23CoreType -- "1" Diameter Sphere23CoreType -- "1" Location Sphere23CoreType -- "1" LatitudeLongitudeSweep </pre>					
type	extension of SurfaceCoreBaseType					
properties	base SurfaceCoreBaseType					
children	Diameter Location LatitudeLongitudeSweep					
used by	element Sphere23Core					
attributes	Name	Type	Use	Default	Fixed	Annotation
	form	Attr23CoreEnumType				documentation The optional form attribute describes the surface form.
	turnedV	xs:boolean		false		documentation The optional turnedV attribute shows if the v direction of the sphere must be inverted. A value of 1 (or true) means the v direction must be inverted. A value of 0 (or false) means the v direction must not be inverted.
	scaleU	DoublePositiveType		1.0		documentation The optional scaleU attribute is the scaling coefficient of the u direction of the parametric space.

	scaleV	DoublePositiveType	1.0	documentation The optional scaleV attribute is the scaling coefficient of the v direction of the parametric space.
annotation	documentation The Sphere23CoreType defines the mathematical core of the geometric entity 'spherical_surface(u,v):R2->R3'.			

attribute **Sphere23CoreType/@turnedV**

type	xs:boolean		
properties	default	false	
annotation	documentation The optional turnedV attribute shows if the v direction of the sphere must be inverted. A value of 1 (or true) means the v direction must be inverted. A value of 0 (or false) means the v direction must not be inverted.		

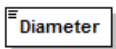
attribute **Sphere23CoreType/@scaleU**

type	DoublePositiveType		
properties	default	1.0	
facets	Kind	Value	Annotation
	minExclusive	0.0	
annotation	documentation The optional scaleU attribute is the scaling coefficient of the u direction of the parametric space.		

attribute **Sphere23CoreType/@scaleV**

type	DoublePositiveType		
properties	default	1.0	
facets	Kind minExclusive	Value 0.0	Annotation
annotation	documentation The optional scaleV attribute is the scaling coefficient of the v direction of the parametric space.		

element **Sphere23CoreType/Diameter**

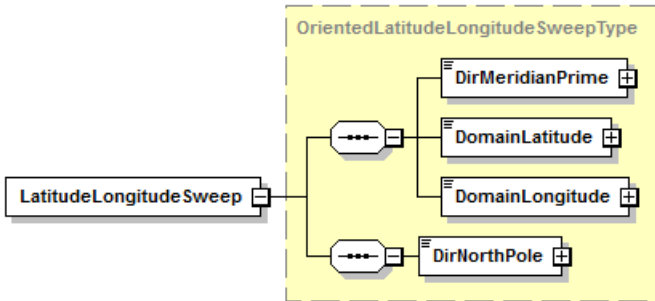
diagram	
type	xs:double
properties	content simple
annotation	<div>documentation</div> <div>The Diameter element is diameter of the sphere.</div>

element **Sphere23CoreType/Location**

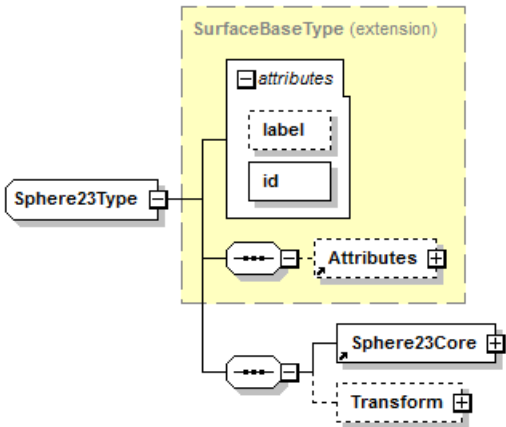
diagram				
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type	PointSimpleType		
properties	content	simple	
facets	Kind	Value	Annotation
	length	3	
annotation	documentation The Location element is a 3D point which defines the sphere center.		

element **Sphere23CoreType/LatitudeLongitudeSweep**

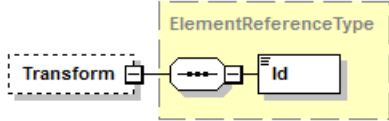
diagram	
type	OrientedLatitudeLongitudeSweepType
properties	content complex
children	DirMeridianPrime DomainLatitude DomainLongitude DirNorthPole
annotation	documentation The LatitudeLongitudeSweep element specifies the sweep angles in the two directions analogous to terrestrial latitude and longitude.

complexType **Sphere23Type**

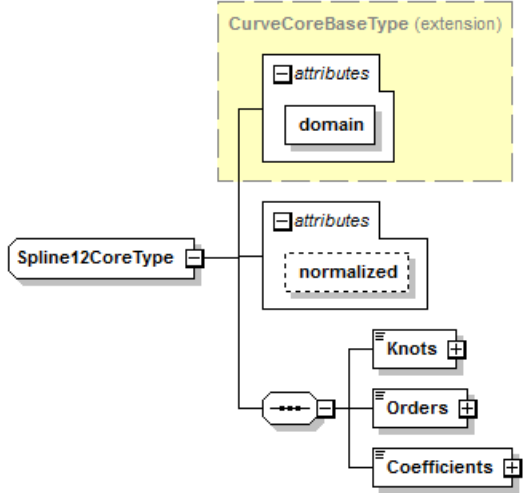
diagram													
type	extension of SurfaceBaseType												
properties	base SurfaceBaseType												
children	Attributes Sphere23Core Transform												
used by	element Sphere23												
attributes	<table><tr><td>Name</td><td>Type</td><td>Use</td><td>Default</td><td>Fixed</td><td>Annotation</td></tr><tr><td>label</td><td>xs:string</td><td></td><td></td><td></td><td>documentation The optional label attribute</td></tr></table>	Name	Type	Use	Default	Fixed	Annotation	label	xs:string				documentation The optional label attribute
Name	Type	Use	Default	Fixed	Annotation								
label	xs:string				documentation The optional label attribute								

	<p>id</p> <p>QIFIdType</p> <p>required</p>	<p>is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.</p> <p>documentation The required id attribute is the unique model entity identifier.</p>
annotation	<p>documentation The Sphere23Type defines the geometric entity 'spherical_surface(u,v):R2->R3'. Any surface can have an additional transformation matrix.</p>	

element **Sphere23Type/Transform**

diagram		
type	ElementReferenceType	
properties	minOcc 0 maxOcc 1 content complex	
children	Id	
annotation	<p>documentation The optional Transform element is the identifier of a three dimensional transformation matrix.</p>	

complexType **Spline12CoreType**

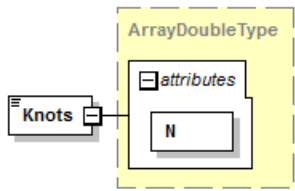
diagram		
type	extension of CurveCoreBaseType	
properties	base	CurveCoreBaseType
children	Knots Orders Coefficients	
used by	element	Spline12Core

attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve. documentation The optional normalized attribute shows if the curve is normalized. A value of 1 (or true) means the curve is normalized. A value of 0 (or false) means the curve is not normalized.
	normalized	xs:boolean		0		
annotation	documentation The Spline12CoreType defines the mathematical core of the geometric entity 'spline_curve(t):R1->R2'. The spline curve is a sequence of parametric polynomial segments.					

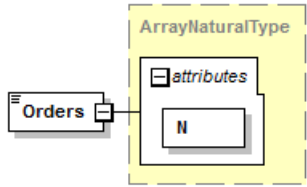
attribute **Spline12CoreType/@normalized**

type	xs:boolean
properties	default 0
annotation	documentation The optional normalized attribute shows if the curve is normalized. A value of 1 (or true) means the curve is normalized. A value of 0 (or false) means the curve is not normalized.

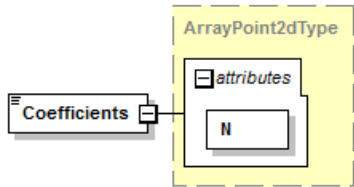
element **Spline12CoreType/Knots**

diagram						
type	ArrayDoubleType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The Knots element is the knot vector which contains the spline breakpoints.					

element **Spline12CoreType/Orders**

diagram						
type	ArrayNaturalType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The Orders element is the orders of the polynomial segments. The order is 'the degree of the polynomial' + 1. The size of this array is 'the number of spline breakpoints' - 1.					

element **Spline12CoreType/Coefficients**

diagram						
type	ArrayPoint2dType					
properties	content complex					
attributes	Name N	Type xs:positiveInteger	Use required	Default	Fixed	Annotation documentation The required N attribute gives the number of points represented by the array. The number of entries in the array must be 2N.
annotation	documentation The Coefficients element is the coefficients of the polynomial segments. The total size of this array is the sum of all orders.					

complexType **Spline12Type**

diagram						
type	extension of Curve12BaseType					
properties	base Curve12BaseType					
children	Attributes Spline12Core					
used by	element Spline12					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Spline12Type defines the geometric entity 'spline_curve(t):R1->R2'. The 2D curves are normally used to define a trimming curve in the parametric space of a surface.					

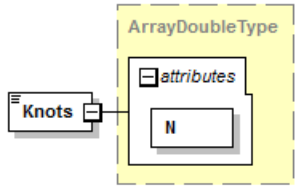
complexType **Spline13CoreType**

diagram						
type	extension of CurveCoreBaseType					
properties	base CurveCoreBaseType					
children	Knots Orders Coefficients					
used by	element Spline13Core					
attributes	Name domain	Type ParameterRangeType	Use required	Default	Fixed	Annotation documentation The required domain attribute is the domain of the parameterization of the curve. documentation The optional normalized attribute shows if the curve is normalized. A value of 1 (or true) means the curve is normalized. A value of 0 (or false) means the curve is not normalized.
	normalized	xs:boolean		0		
annotation	documentation The Spline13CoreType defines the mathematical core of the geometric entity 'spline_curve(t):R1->R3'. The spline curve is a sequence of parametric polynomial segments.					

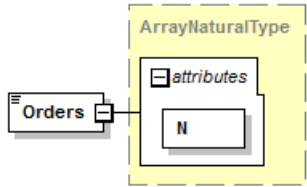
attribute **Spline13CoreType/@normalized**

type	xs:boolean
properties	default 0
annotation	documentation The optional normalized attribute shows if the curve is normalized. A value of 1 (or true) means the curve is normalized. A value of 0 (or false) means the curve is not normalized.

element **Spline13CoreType/Knots**

diagram						
type	ArrayDoubleType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The Knots element is the knot vector which contains the spline breakpoints.					

element **Spline13CoreType/Orders**

diagram						
type	ArrayNaturalType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The Orders element is the orders of the polynomial segments. The order is 'the degree of the polynomial' + 1. The size of this array is 'the number of spline breakpoints' - 1.					

element **Spline13CoreType/Coefficients**

diagram																																																																														
type	ArrayPointType																																																																													
properties	content	complex																																																																												
attributes	<table><tr><th>Name</th><th>Type</th><th>Use</th><th>Default</th><th>Fixed</th><th>Annotation</th></tr><tr><td>N</td><td>xs:positiveInteger</td><td>required</td><td></td><td></td><td>documentation The required N attribute gives the number of points represented by the array. The number of entries in the array must be 3N.</td></tr><tr><td>linearUnit</td><td>xs:token</td><td></td><td></td><td></td><td></td></tr><tr><td>decimalPlaces</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>significantFigures</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>validity</td><td>ValidityEnumType</td><td></td><td></td><td></td><td></td></tr><tr><td>xDecimalPlaces</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>xSignificantFigures</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>xValidity</td><td>ValidityEnumType</td><td></td><td></td><td></td><td></td></tr><tr><td>yDecimalPlaces</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>ySignificantFigures</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td><td></td></tr><tr><td>yValidity</td><td>ValidityEnumType</td><td></td><td></td><td></td><td></td></tr></table>	Name	Type	Use	Default	Fixed	Annotation	N	xs:positiveInteger	required			documentation The required N attribute gives the number of points represented by the array. The number of entries in the array must be 3N.	linearUnit	xs:token					decimalPlaces	xs:nonNegativeInteger					significantFigures	xs:nonNegativeInteger					validity	ValidityEnumType					xDecimalPlaces	xs:nonNegativeInteger					xSignificantFigures	xs:nonNegativeInteger					xValidity	ValidityEnumType					yDecimalPlaces	xs:nonNegativeInteger					ySignificantFigures	xs:nonNegativeInteger					yValidity	ValidityEnumType									
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xValidity	ValidityEnumType																																																																													
yDecimalPlaces	xs:nonNegativeInteger																																																																													
ySignificantFigures	xs:nonNegativeInteger																																																																													
yValidity	ValidityEnumType																																																																													

	zDecimalPlaces xs:nonNegativeInteger zSignificantFigures xs:nonNegativeInteger zValidity ValidityEnumType
annotation	documentation The Coefficients element is the coefficients of the polynomial segments. For each segment the number of coefficients equals the polynomial order on this segment. The total size of this array is the sum of all orders.

complexType **Spline13Type**

diagram						
type	extension of Curve13BaseType					
properties	base Curve13BaseType					
children	Attributes Spline13Core Transform					
used by	element Spline13					
attributes	Name	Type	Use	Default	Fixed	Annotation
	label	xs:string				documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Spline13Type defines the geometric entity 'spline_curve(t):R1->R3'. Any 3D geometry can have an additional transformation matrix.					

element **Spline13Type/Transform**

diagram	
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type	ElementReferenceType
properties	minOcc 0 maxOcc 1 content complex
children	Id
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.

complexType **Spline23CoreType**

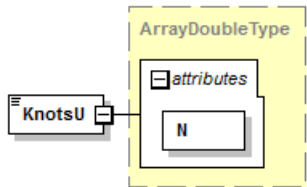
diagram	<p>The diagram illustrates the Spline23CoreType structure. It is an extension of SurfaceCoreBaseType. The base type has two attributes: 'form' and 'normalized'. The extension adds a choice of five elements: 'KnotsU', 'KnotsV', 'OrdersU', 'OrdersV', and 'Coefficients'.</p>					
type	extension of SurfaceCoreBaseType					
properties	base SurfaceCoreBaseType					
children	KnotsU KnotsV OrdersU OrdersV Coefficients					
used by	element Spline23Core					
attributes	Name	Type	Use	Default	Fixed	Annotation
	form	Attr23CoreEnumType				documentation The optional form attribute describes the surface form.
	normalized	xs:boolean		0		documentation The optional normalized attribute shows if the spline surface is normalized. A value of 1 (or true) means the surface is normalized. A value of 0 (or false) means the surface is not normalized.

annotation	documentation The Spline23CoreType defines the mathematical core of the geometric entity 'spline_surface(u,v):R2->R3'. The spline surface is a grid of parametric polynomial patches.
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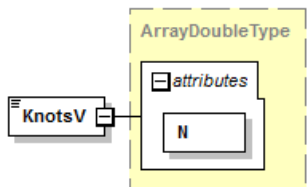
attribute **Spline23CoreType/@normalized**

type	xs:boolean
properties	default 0
annotation	documentation The optional normalized attribute shows if the spline surface is normalized. A value of 1 (or true) means the surface is normalized. A value of 0 (or false) means the surface is not normalized.

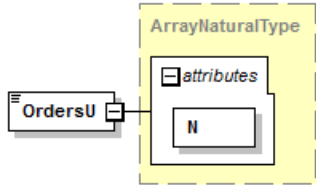
element **Spline23CoreType/KnotsU**

diagram						
type	ArrayDoubleType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The KnotsU element is the knot vector in the u direction (the u spline breakpoints).					

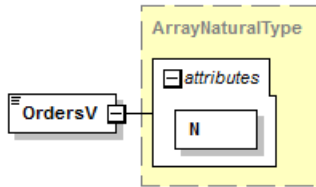
element **Spline23CoreType/KnotsV**

diagram						
type	ArrayDoubleType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The KnotsV element is the knot vector in the v direction (the v spline breakpoints).					

element **Spline23CoreType/OrdersU**

diagram						
type	ArrayNaturalType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The OrdersU element is the orders of the polynomial patches in the u direction. The order is 'the degree of the polynomial' + 1. The size of this array is 'the number of the u spline breakpoints' - 1.					

element **Spline23CoreType/OrdersV**

diagram						
type	ArrayNaturalType					
properties	content complex					
attributes	Name N	Type xs:unsignedInt	Use required	Default	Fixed	Annotation documentation The required N attribute shows how many objects are present in this array.
annotation	documentation The OrdersV element is the orders of the polynomial patches in the v direction. The order is 'the degree of the polynomial' + 1. The size of this array is 'the number of the v spline breakpoints' - 1.					

element **Spline23CoreType/Coefficients**

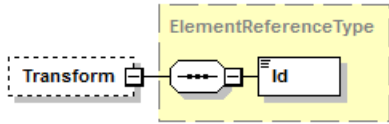
diagram																																																																																			
type	ArrayPointType																																																																																		
properties	content	complex																																																																																	
attributes	<table><tr><th>Name</th><th>Type</th><th>Use</th><th>Default</th><th>Fixed</th><th>Annotation</th></tr><tr><td>N</td><td>xs:positiveInteger</td><td>required</td><td></td><td></td><td rowspan="14">documentation The required N attribute gives the number of points represented by the array. The number of entries in the array must be 3N.</td></tr><tr><td>linearUnit</td><td>xs:token</td><td></td><td></td><td></td></tr><tr><td>decimalPlaces</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td></tr><tr><td>significantFigures</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td></tr><tr><td>validity</td><td>ValidityEnumType</td><td></td><td></td><td></td></tr><tr><td>xDecimalPlaces</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td></tr><tr><td>xSignificantFigures</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td></tr><tr><td>xValidity</td><td>ValidityEnumType</td><td></td><td></td><td></td></tr><tr><td>yDecimalPlaces</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td></tr><tr><td>ySignificantFigures</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td></tr><tr><td>yValidity</td><td>ValidityEnumType</td><td></td><td></td><td></td></tr><tr><td>zDecimalPlaces</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td></tr><tr><td>zSignificantFigures</td><td>xs:nonNegativeInteger</td><td></td><td></td><td></td></tr><tr><td>zValidity</td><td>ValidityEnumType</td><td></td><td></td><td></td></tr></table>	Name	Type	Use	Default	Fixed	Annotation	N	xs:positiveInteger	required			documentation The required N attribute gives the number of points represented by the array. The number of entries in the array must be 3N.	linearUnit	xs:token				decimalPlaces	xs:nonNegativeInteger				significantFigures	xs:nonNegativeInteger				validity	ValidityEnumType				xDecimalPlaces	xs:nonNegativeInteger				xSignificantFigures	xs:nonNegativeInteger				xValidity	ValidityEnumType				yDecimalPlaces	xs:nonNegativeInteger				ySignificantFigures	xs:nonNegativeInteger				yValidity	ValidityEnumType				zDecimalPlaces	xs:nonNegativeInteger				zSignificantFigures	xs:nonNegativeInteger				zValidity	ValidityEnumType								
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	zDecimalPlaces xs:nonNegativeInteger zSignificantFigures xs:nonNegativeInteger zValidity ValidityEnumType
annotation	documentation The Coefficients element is the coefficients of the polynomial patches. For each patch the number of coefficients equals ['the u polynomial order of the patch' times 'the v polynomial order of the patch']. The total size of this array is the sum of all patch coefficients.

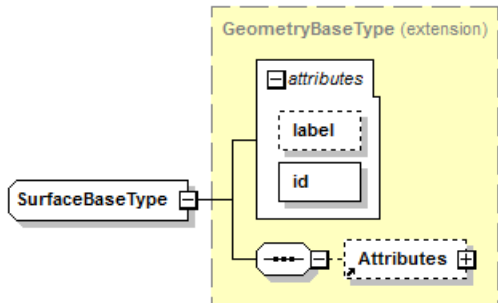
complexType **Spline23Type**

diagram						
type	extension of SurfaceBaseType					
properties	base SurfaceBaseType					
children	Attributes Spline23Core Transform					
used by	element Spline23					
attributes	Name label id	Type xs:string QIFIdType	Use required	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree. documentation The required id attribute is the unique model entity identifier.
annotation	documentation The Spline23Type defines the geometric entity 'spline_surface(u,v):R2->R3'. Any surface can have an additional transformation matrix.					

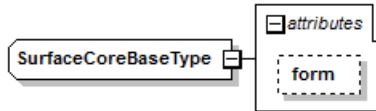
element **Spline23Type/Transform**

diagram	
type	ElementReferenceType
properties	minOcc 0 maxOcc 1 content complex
children	Id
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.

complexType **SurfaceBaseType**

diagram						
type	extension of GeometryBaseType					
properties	base GeometryBaseType abstract true					
children	Attributes					
used by	element Surface complexTypes Cone23Type Cylinder23Type Extrude23Type Nurbs23Type Offset23Type Plane23Type Revolution23Type Ruled23Type Sphere23Type Spline23Type Torus23Type					
attributes	Name label	Type xs:string	Use	Default	Fixed	Annotation documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.
	id	QIFIdType	required			documentation The required id attribute is the unique model entity identifier.
annotation	documentation The SurfaceBaseType is the abstract base type for all geometric surfaces (R2->R3) present in the CAD scene.					

complexType **SurfaceCoreBaseType**

diagram						
properties	abstract true					
used by	element complexType	SurfaceCore Cone23CoreType Cylinder23CoreType Extrude23CoreType Nurbs23CoreType Offset23CoreType Plane23CoreType Revolution23CoreType Ruled23CoreType Sphere23CoreType Spline23CoreType Torus23CoreType				
attributes	Name form	Type Attr23CoreEnumType	Use	Default	Fixed	Annotation documentation The optional form attribute describes the surface form.
annotation	documentation The SurfaceCoreBaseType is the abstract base type for all mathematical cores of surfaces present in the CAD scene.					

attribute **SurfaceCoreBaseType/@form**

type	Attr23CoreEnumType		
facets	Kind	Value	Annotation
	enumeration	FREEFORM	
	enumeration	CYLINDER	
	enumeration	CONE	
	enumeration	TORUS	
	enumeration	SPHERE	
	enumeration	PLANE	
annotation	<div>documentation</div> <div>The optional form attribute describes the surface form.</div>		

complexType **SurfaceCoreType**

diagram	
children	SurfaceCore
used by	element Offset23CoreType/Surface
annotation	documentation The SurfaceCoreType represents a container for a single surface.

complexType **SurfaceMeshSetType**

diagram	<pre>classDiagram class SurfaceMeshSetType class MeshTriangle SurfaceMeshSetType "1" *-- "1..∞" MeshTriangle class attributes { N }</pre>												
children	MeshTriangle												
used by	element SurfaceMeshSet												
attributes	<table><thead><tr><th>Name</th><th>Type</th><th>Use</th><th>Default</th><th>Fixed</th><th>Annotation</th></tr></thead><tbody><tr><td>N</td><td>NaturalType</td><td>required</td><td></td><td></td><td>documentation The required N attribute is the number of objects in this set.</td></tr></tbody></table>	Name	Type	Use	Default	Fixed	Annotation	N	NaturalType	required			documentation The required N attribute is the number of objects in this set.
Name	Type	Use	Default	Fixed	Annotation								
N	NaturalType	required			documentation The required N attribute is the number of objects in this set.								
annotation	documentation The SurfaceMeshSetType represents a container for storing all mesh surfaces present in the CAD scene.												

attribute **SurfaceMeshSetType/@N**

type	NaturalType
------	--------------------

properties	use required
facets	Kind Value Annotation minInclusive 1
annotation	documentation The required N attribute is the number of objects in this set.

complexType SurfaceSetType

diagram						
children	Surface					
used by	element SurfaceSet					
attributes	Name N	Type NaturalType	Use required	Default	Fixed	Annotation documentation The required N attribute is the number of

		objects in this set.
annotation	documentation The SurfaceSetType represents a container for storing all surfaces present in the CAD scene.	

attribute **SurfaceSetType/@N**

type	NaturalType		
properties	use	required	
facets	Kind	Value	Annotation
	minInclusive	1	
annotation	documentation The required N attribute is the number of objects in this set.		

complexType **Torus23CoreType**

diagram						
type	extension of SurfaceCoreBaseType					
properties	base SurfaceCoreBaseType					
children	DiameterMinor DiameterMajor Axis LatitudeLongitudeSweep					
used by	element Torus23Core					
attributes	Name	Type	Use	Default	Fixed	Annotation
	form	Attr23CoreEnumType				documentation The optional form attribute describes the surface form.
	turnedV	xs:boolean		false		documentation The optional turnedV attribute shows if the v

	<p>offsetV xs:double 0.0</p> <p>scaleU DoublePositiveType 1.0</p> <p>scaleV DoublePositiveType 1.0</p>	<p>direction of the torus must be inverted. A value of 1 (or true) means the v direction must be inverted. A value of 0 (or false) means the v direction must not be inverted.</p> <p>documentation The optional offsetV attribute specifies the offset of v parameter before passing parameter to torus formula.</p> <p>documentation The optional scaleU attribute is the scaling coefficient of the u direction of the parametric space.</p> <p>documentation The optional scaleV attribute is the scaling coefficient of the v direction of the parametric space.</p>
annotation	<p>documentation The Torus23CoreType defines the mathematical core of the geometric entity 'toroidal_surface(u,v):R2->R3'.</p>	

attribute Torus23CoreType/@turnedV

type	xs:boolean
properties	default false
annotation	<p>documentation The optional turnedV attribute shows if the v direction of the torus must be inverted. A value of 1 (or true) means the v direction must be inverted. A value of 0 (or false) means the v direction must not be inverted.</p>

attribute Torus23CoreType/@offsetV

type	xs:double
properties	default 0.0
annotation	<p>documentation The optional offsetV attribute specifies the offset of v parameter before passing parameter to torus formula.</p>

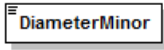
attribute **Torus23CoreType/@scaleU**

type	DoublePositiveType		
properties	default	1.0	
facets	Kind	Value	Annotation
	minExclusive	0.0	
annotation	documentation The optional scaleU attribute is the scaling coefficient of the u direction of the parametric space.		


attribute **Torus23CoreType/@scaleV**

type	DoublePositiveType		
properties	default	1.0	
facets	Kind minExclusive	Value 0.0	Annotation
annotation	documentation The optional scaleV attribute is the scaling coefficient of the v direction of the parametric space.		

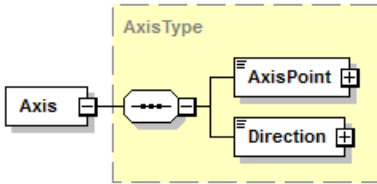
element **Torus23CoreType/DiameterMinor**

diagram	
type	xs:double
properties	content simple
annotation	<div>documentation</div> <div>The DiameterMinor element is the torus minor diameter.</div>

element **Torus23CoreType/DiameterMajor**

diagram	
type	xs:double
properties	content simple
annotation	documentation The DiameterMajor element is the torus major diameter.

element **Torus23CoreType/Axis**

diagram	
type	AxisType
properties	content complex
children	AxisPoint Direction
annotation	documentation The Axis is the unit axis vector of the torus.

element **Torus23CoreType/LatitudeLongitudeSweep**

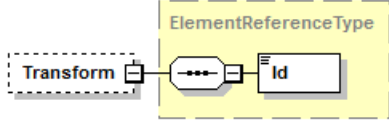
diagram	
type	LatitudeLongitudeSweepType
properties	content complex
children	DirMeridianPrime DomainLatitude DomainLongitude
annotation	documentation The LatitudeLongitudeSweep element specifies the sweep angles in the two directions analogous to terrestrial latitude and longitude.

complexType **Torus23Type**

diagram																			
type	extension of SurfaceBaseType																		
properties	base SurfaceBaseType																		
children	Attributes Torus23Core Transform																		
used by	element Torus23																		
attributes	<table><thead><tr><th>Name</th><th>Type</th><th>Use</th><th>Default</th><th>Fixed</th><th>Annotation</th></tr></thead><tbody><tr><td>label</td><td>xs:string</td><td></td><td></td><td></td><td>documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.</td></tr><tr><td>id</td><td>QIFIdType</td><td>required</td><td></td><td></td><td>documentation The required id attribute is</td></tr></tbody></table>	Name	Type	Use	Default	Fixed	Annotation	label	xs:string				documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.	id	QIFIdType	required			documentation The required id attribute is
Name	Type	Use	Default	Fixed	Annotation														
label	xs:string				documentation The optional label attribute is the model entity "nameplate". Normally it can be seen at the entity item in the project tree.														
id	QIFIdType	required			documentation The required id attribute is														

		the unique model entity identifier.
annotation	documentation The Torus23Type defines the geometric entity 'toroidal_surface(u,v):R2->R3'. Any surface can have an additional transformation matrix. The center of the torus is at the AxisPoint of the Axis, and the axis of the torus is the Axis.	

element **Torus23Type/Transform**

diagram		
type	ElementReferenceType	
properties	minOcc 0 maxOcc 1 content complex	
children	Id	
annotation	documentation The optional Transform element is the identifier of a three dimensional transformation matrix.	

simpleType **ArcConicFormEnumType**

type	restriction of xs:string	
properties	base	xs:string
used by	attributes	ArcConic13CoreType/@form ArcConic12CoreType/@form
facets	Kind	Value Annotation
	enumeration	PARABOLA
	enumeration	ELLIPSE
	enumeration	HYPERBOLA
annotation	documentation	
	<p>The ArcConicFormEnumType enumerates values that describe the conic arc form and can take the following values:</p> <p>'PARABOLA' - a parabola;</p> <p>'ELLIPSE' - an ellipse;</p> <p>'HYPERBOLA' - a hyperbola;</p>	

simpleType **Attr23CoreEnumType**

type	restriction of xs:string	
properties	base	xs:string
used by	attribute	SurfaceCoreBaseType/@form
facets	Kind	Value Annotation
	enumeration	FREEFORM
	enumeration	CYLINDER
	enumeration	CONE
	enumeration	TORUS
	enumeration	SPHERE
	enumeration	PLANE

annotation	documentation
	<p>The Attr23CoreEnumType enumerates values that describe the surface form:</p> <ul style="list-style-type: none">'FREEFORM' - a freeform surface (NURBS, spline etc.);'CYLINDER' - a cylindrical surface;'CONE' - a conical surface;'TORUS' - a toroidal surface;'SPHERE' - a spherical surface;'PLANE' - a plane surface;