



DE	Begrenzte Kurve
EN	Trimmed Curve
FR	Courbe de rognage

Item	SPF	XML	Change	Description
IFC4 Addendum 1				
IfcTrimmedCurve				
SenseAgreement			MODIFIED	Type changed from <i>BOOLEAN</i> to <i>IfcBoolean</i> .

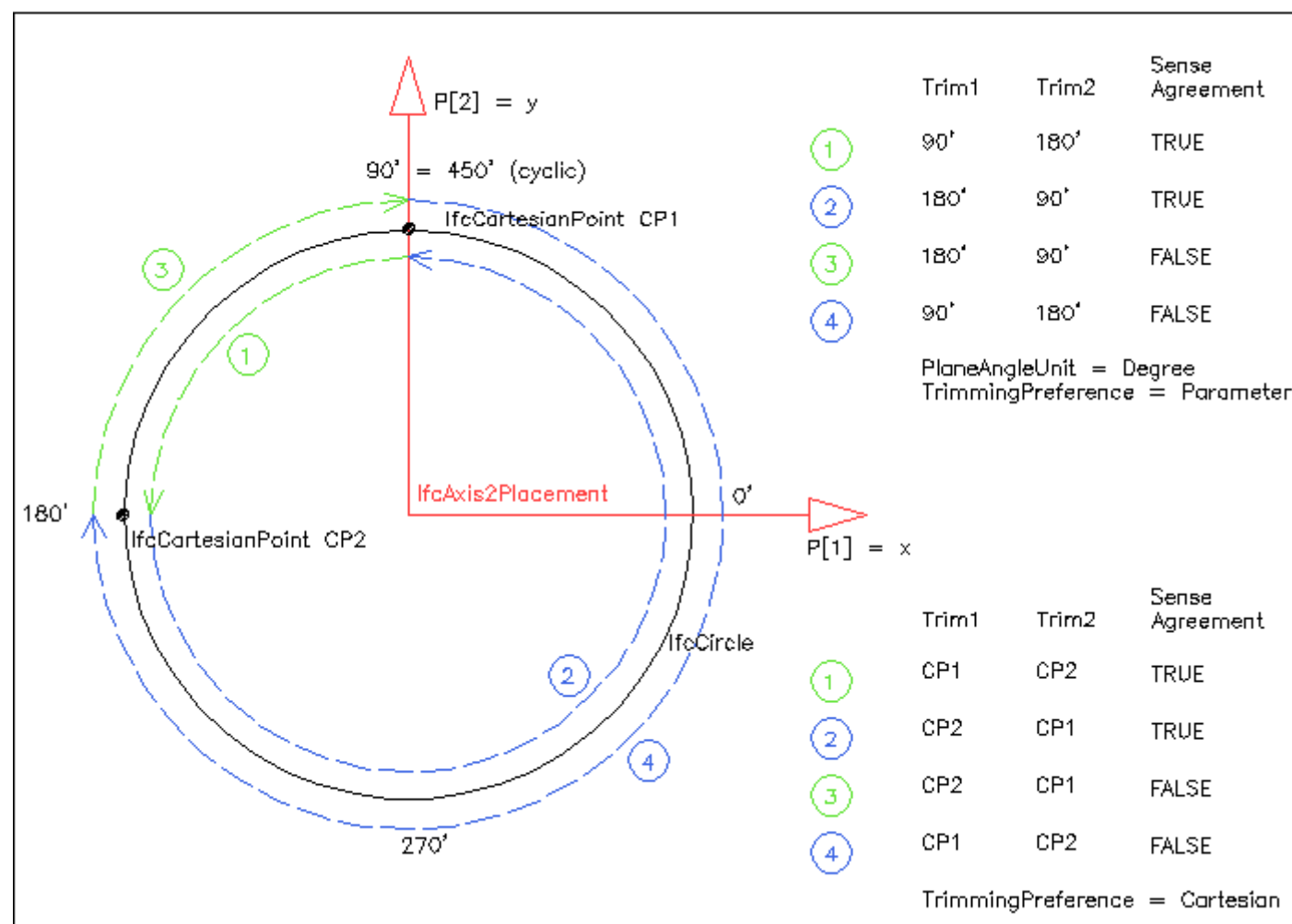


Figure 379 shows the four arcs (dashed blue and green lines with arrow showing different orientations) that can be defined by the same *BasisCurve* (of type *IfcCircle*) and the same trimming points (given by Cartesian points and parameter values) by using different assignments to *Trim1* and *Trim2* and *SenseAgreement*.

NOTE Since the *BasisCurve* is closed (type *IfcCircle*), the exception of the informal proposition IP3 applies, i.e. the sense flag is not required to be consistent with the parameter values of *Trim1* and *Trim2*, so the rule (sense = parameter 1 < parameter 2) may not be fulfilled.

NOTE Definition according to ISO/CD 10303-42:1992

A trimmed curve is a bounded curve which is created by taking a selected portion, between two identified points, of the associated basis curve. The basis curve itself is unaltered and more than one trimmed curve may reference the same basis curve. Trimming points for the curve may be identified by:

- parametric value
- geometric position
- both of the above

At least one of these shall be specified at each end of the curve. The *SenseAgreement* makes it possible to unambiguously define any segment of a closed curve such as a circle. The combinations of sense and ordered end points make it possible to define four distinct directed segments connecting two different points on a circle or other closed curve. For this purpose cyclic properties of the parameter range are assumed; for example, 370 degrees is equivalent to 10 degrees.

The *IfcTrimmedCurve* has a parameterization which is inherited from the particular basis curve reference. More precisely the parameter *s* of the trimmed curve is derived from the parameter of the basis curve as follows:

- if *SenseAgreement* is TRUE: $s = t - t_1$
- if *SenseAgreement* is FALSE: $s = t_2 - t$

In the above equations t_1 is the value given by *Trim1* or the parameter value corresponding to point 1 and t_2 is the value given by *Trim2* or the parameter value corresponding to point 2. The resultant *IfcTrimmedCurve* has a parameter ranging from 0 at the first trimming point to $|t_2 - t_1|$ at the second trimming point.

NOTE In case of a closed curve, it may be necessary to increment t_1 or t_2 by the parametric length for consistency with the sense flag.

NOTE Entity adapted from **trimmed_curve** defined in ISO 10303-42

HISTORY New entity in IFC1.0

Informal Propositions:

1. Where both the parameter value and the Cartesian point exist for *Trim1* and *Trim2* they shall be consistent. (i.e., the *BasisCurve* evaluated at the parameter value shall coincide with the specified point).
2. When a Cartesian point is specified by *Trim1* or by *Trim2* it shall lie on the *BasisCurve*.
3. Except the case of a closed *BasisCurve* where both parameter 1 and parameter 2 exist, they shall be consistent with the sense flag, i.e., (sense = parameter 1 < parameter 2). Or, for every open curve where both parameter 1 and parameter 2 exist, they shall be consistent with the *SenseAgreement*, i.e., *SenseAgreement* = (parameter 1 < parameter 2).
4. If both parameter 1 and parameter 2 exist, then parameter 1 <> parameter 2. For a closed base curve, e.g. *IfcCircle* or *IfcEllipse*, this also applies to the cyclic properties, as 360' is equal to 0', parameter 1 = 360' and parameter 2 = 0' are treated as being equal and therefore violating this proposition.
5. When a parameter value is specified by *Trim1* or *Trim2* it shall lie within the parametric range of the *BasisCurve*.

▼ Attribute definitions

#	Attribute	Type	Cardinality	Description	G
1	BasisCurve	<i>IfcCurve</i>		The curve to be trimmed. For curves with multiple representations any parameter values given as Trim1 or Trim2 refer to the master representation of the BasisCurve only.	X
2	Trim1	<i>IfcTrimmingSelect</i>	S[1:2]	The first trimming point which may be specified as a Cartesian point, as a real parameter or both.	X
3	Trim2	<i>IfcTrimmingSelect</i>	S[1:2]	The second trimming point which may be specified as a Cartesian point, as a real parameter or both.	X
4	SenseAgreement	<i>IfcBoolean</i>		Flag to indicate whether the direction of the trimmed curve agrees with or is opposed to the direction of the basis curve.	X
5	MasterRepresentation	<i>IfcTrimmingPreference</i>		Where both parameter and point are present at either end of the curve this indicates the preferred form.	X

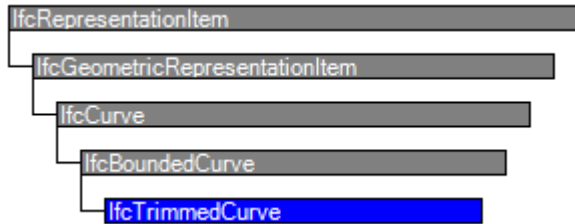
▼ Formal Propositions

Rule	Description
Trim1ValuesConsistent	Either a single value is specified for Trim1, or the two trimming values are of different type (point and parameter)

Trim2ValuesConsistent	Either a single value is specified for Trim2, or the two trimming values are of different type (point and parameter)
NoTrimOfBoundedCurves	Already bounded curves shall not be trimmed.

8.9.3.66.2 Inherited definitions from supertypes

▼ Entity inheritance



▼ Attribute inheritance

#	Attribute	Type	Cardinality	Description	G
<i>IfcRepresentationItem</i>					
	LayerAssignment	IfcPresentationLayerAssignment @AssignedItems	S[0:1]	Assignment of the representation item to a single or multiple layer(s). The <i>LayerAssignments</i> can override a <i>LayerAssignments</i> of the <i>IfcRepresentation</i> it is used within the list of <i>Items</i> . IFC2x3 CHANGE The inverse attribute <i>LayerAssignments</i> has been added. IFC4 CHANGE The inverse attribute <i>LayerAssignment</i> has been restricted to max 1. Upward compatibility for file based exchange is guaranteed.	X
	StyledByItem	IfcStyledItem @Item	S[0:1]	Reference to the <i>IfcStyledItem</i> that provides presentation information to the representation, e.g. a curve style, including colour and thickness to a geometric curve. IFC2x3 CHANGE The inverse attribute <i>StyledByItem</i> has been added.	X
<i>IfcGeometricRepresentationItem</i>					
<i>IfcCurve</i>					
	Dim :=IfcCurveDim(SELF)	IfcDimensionCount		The space dimensionality of this abstract class, defined differently for all subtypes, i.e. for <i>IfcLine</i> , <i>IfcConic</i> and <i>IfcBoundedCurve</i> .	X
<i>IfcBoundedCurve</i>					
<i>IfcTrimmedCurve</i>					
1	BasisCurve	IfcCurve		The curve to be trimmed. For curves with multiple representations any parameter values given as Trim1 or Trim2 refer to the master representation of the BasisCurve only.	X
2	Trim1	IfcTrimmingSelect	S[1:2]	The first trimming point which may be specified as a Cartesian point, as a real parameter or both.	X
3	Trim2	IfcTrimmingSelect	S[1:2]	The second trimming point which may be specified as a Cartesian point, as a real parameter or both.	X
4	SenseAgreement	IfcBoolean		Flag to indicate whether the direction of the trimmed curve agrees with or is opposed to the direction of the basis curve.	X
5	MasterRepresentation	IfcTrimmingPreference		Where both parameter and point are present at either end of the curve this indicates the preferred form.	X

8.9.3.66.3 Formal representations

▼ XML Specification

```

<xs:element name="IfcTrimmedCurve" type="ifc:IfcTrimmedCurve"
substitutionGroup="ifc:IfcBoundedCurve" nillable="true"/>
<xs:complexType name="IfcTrimmedCurve">
  <xs:complexContent>
    <xs:extension base="ifc:IfcBoundedCurve">
      <xs:sequence>
        <xs:element name="BasisCurve" type="ifc:IfcCurve" nillable="true"/>
        <xs:element name="Trim1">
          <xs:complexType>
            <xs:group ref="ifc:IfcTrimmingSelect" maxOccurs="2"/>
            <xs:attribute ref="ifc:itemType" fixed="ifc:IfcTrimmingSelect"/>
          </xs:complexType>
        </xs:element>
        <xs:element name="Trim2">
          <xs:complexType>
            <xs:group ref="ifc:IfcTrimmingSelect" maxOccurs="2"/>
            <xs:attribute ref="ifc:itemType" fixed="ifc:IfcTrimmingSelect"/>
          </xs:complexType>
        </xs:element>
        <xs:element name="SenseAgreement" type="ifc:IfcBoolean"/>
        <xs:element name="MasterRepresentation" type="ifc:IfcTrimmingPreference"/>
      </xs:sequence>
    </xs:extension>
  </xs:complexContent>
</xs:complexType>

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    <xs:attribute ref="ifc:cType" fixed="set"/>
    <xs:attribute ref="ifc:arraySize" use="optional"/>
  </xs:complexType>
</xs:element>
<xs:element name="Trim2">
  <xs:complexType>
    <xs:group ref="ifc:IfcTrimmingSelect" maxOccurs="2"/>
    <xs:attribute ref="ifc:itemType" fixed="ifc:IfcTrimmingSelect"/>
    <xs:attribute ref="ifc:cType" fixed="set"/>
    <xs:attribute ref="ifc:arraySize" use="optional"/>
  </xs:complexType>
</xs:element>
</xs:sequence>
<xs:attribute name="SenseAgreement" type="ifc:IfcBoolean" use="optional"/>
<xs:attribute name="MasterRepresentation" type="ifc:IfcTrimmingPreference"
use="optional"/>
</xs:extension>
</xs:complexContent>
</xs:complexType>

```


▼ EXPRESS Specification

```

ENTITY IfcTrimmedCurve
SUBTYPE OF (IfcBoundedCurve);
  BasisCurve : IfcCurve;
  Trim1 : SET [1:2] OF IfcTrimmingSelect;
  Trim2 : SET [1:2] OF IfcTrimmingSelect;
  SenseAgreement : IfcBoolean;
  MasterRepresentation : IfcTrimmingPreference;
WHERE
  Trim1ValuesConsistent : (HIINDEX(Trim1) = 1) OR (TYPEOF(Trim1[1]) <> TYPEOF(Trim1[2]));
  Trim2ValuesConsistent : (HIINDEX(Trim2) = 1) OR (TYPEOF(Trim2[1]) <> TYPEOF(Trim2[2]));
  NoTrimOfBoundedCurves : NOT('IFCGEOMETRYRESOURCE.IfcboundedCurve' IN TYPEOF(BasisCurve));
END_ENTITY;

```

 EXPRESS-G diagram

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