

续表 D.9.3

函数	EXPRESS 描述
二轴构建 (IfcBuild2Axes)	<pre> FUNCTION IfcBuild2Axes (RefDirection : IfcDirection) : LIST [2:2] OF IfcDirection; LOCAL D : IfcDirection := NVL(IfcNormalise(RefDirection), IfcRepresentationItem() IfcGeometricRepresentationItem () IfcDirection([1.0,0.0])); END_LOCAL; RETURN([D, IfcOrthogonalComplement(D)]); END_FUNCTION </pre>
轴构建 (IfcBuildAxes)	<pre> FUNCTION IfcBuildAxes (Axis, RefDirection : IfcDirection) : LIST [3:3] OF IfcDirection; LOCAL D1, D2 : IfcDirection; END_LOCAL; D1 := NVL(IfcNormalise(Axis), IfcRepresentationItem() IfcGeometricRepresentationItem () Ifc Direction([0.0,0.0,1.0])); D2 := IfcFirstProjAxis(D1, RefDirection); RETURN ([D2, IfcNormalise(IfcCrossProduct(D1,D2))\IfcVector.Orientation, D1]); END_FUNCTION </pre>
B 样条约束参数 (IfcConstraints ParamBSpline)	<pre> FUNCTION IfcConstraintsParamBSpline (Degree, UpKnots, UpCp : INTEGER; KnotMult : LIST OF INTEGER; Knots : LIST OF IfcParameterValue) : BOOLEAN; LOCAL Result : BOOLEAN := TRUE; K, Sum : INTEGER; END_LOCAL; (* Find sum of knot multiplicities *) Sum := KnotMult[1]; REPEAT i := 2 TO UpKnots; Sum := Sum + KnotMult[i]; END_REPEAT; (* Check limits holding for all B-spline parametrisations *) IF (Degree < 1) OR (UpKnots < 2) OR (UpCp < Degree) OR (Sum <> (Degree + UpCp + 2)) THEN Result := FALSE; RETURN(Result); END_IF; K := KnotMult[1]; IF (K < 1) OR (K > Degree + 1) THEN Result := FALSE; RETURN(Result); END_IF; REPEAT i := 2 TO UpKnots; IF (KnotMult[i] < 1) OR (Knots[i] <= Knots[i-1]) THEN Result := FALSE; RETURN(Result); END_IF; K := KnotMult[i]; IF (i < UpKnots) AND (K > Degree) THEN Result := FALSE; RETURN(Result); END_IF; IF (i = UpKnots) AND (K > Degree + 1) THEN Result := FALSE; RETURN(Result); END_IF; END_REPEAT; RETURN(result); END_FUNCTION </pre>

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函数	EXPRESS 描述
叉积 (IfcCrossProduct)	<pre> FUNCTION IfcCrossProduct (Arg1, Arg2 : IfcDirection) : IfcVector; LOCAL Mag : REAL; Res : IfcDirection; V1, V2 : LIST[3;3] OF REAL; Result : IfcVector; END_LOCAL; IF (NOT EXISTS (Arg1) OR (Arg1.Dim = 2)) OR (NOT EXISTS (Arg2) OR (Arg2.Dim = 2)) THEN RETURN(?); ELSE BEGIN V1 := IfcNormalise(Arg1)\IfcDirection.DirectionRatios; V2 := IfcNormalise(Arg2)\IfcDirection.DirectionRatios; Res := IfcRepresentationItem() IfcGeometricRepresentationItem () IfcDirection([(V1[2] * V2[3] - V1[3] * V2[2]), (V1[3] * V2[1] - V1[1] * V2[3]), (V1[1] * V2[2] - V1[2] * V2[1])]); Mag := 0.0; REPEAT i := 1 TO 3; Mag := Mag + Res.DirectionRatios[i] * Res.DirectionRatios[i]; END_REPEAT; IF (Mag > 0.0) THEN Result := IfcRepresentationItem () IfcGeometricRepresentationItem () IfcVector (Res, SQRT(Mag)); ELSE Result := IfcRepresentationItem() IfcGeometricRepresentationItem () IfcVector(Arg1, 0.0); END_IF; RETURN(Result); END; END_IF; END_FUNCTION </pre>
曲线维数 (IfcCurveDim)	<pre> FUNCTION IfcCurveDim (Curve : IfcCurve) : IfcDimensionCount; IF ('IFCGEOMETRYRESOURCE.IFCLINE' IN TYPEOF(Curve)) THEN RETURN(Curve\IfcLine.Pnt.Dim); END_IF; IF ('IFCGEOMETRYRESOURCE.IFCCONIC' IN TYPEOF(Curve)) THEN RETURN(Curve\IfcConic.Position.Dim); END_IF; IF ('IFCGEOMETRYRESOURCE.IFCPOLYLINE' IN TYPEOF(Curve)) THEN RETURN(Curve\IfcPolyline.Points[1].Dim); END_IF; IF ('IFCGEOMETRYRESOURCE.IFCTRIMMEDCURVE' IN TYPEOF(Curve)) THEN RETURN(IfcCurveDim(Curve\IfcTrimmedCurve.BasisCurve)); END_IF; IF ('IFCGEOMETRYRESOURCE.IFCCOMPOSITECURVE' IN TYPEOF(Curve)) THEN RETURN(Curve\IfcCompositeCurve.Segments[1].Dim); END_IF; IF ('IFCGEOMETRYRESOURCE.IFCBSPLINECURVE' IN TYPEOF(Curve)) THEN RETURN(Curve\IfcBSplineCurve.ControlPointsList[1].Dim); END_IF; IF ('IFCGEOMETRYRESOURCE.IFCOFFSETCURVE2D' IN TYPEOF(Curve)) THEN RETURN(2); END_IF; IF ('IFCGEOMETRYRESOURCE.IFCOFFSETCURVE3D' IN TYPEOF(Curve)) THEN RETURN(3); END_IF; IF ('IFCGEOMETRYRESOURCE.IFCPCURVE' IN TYPEOF(Curve)) THEN RETURN(3); END_IF; RETURN (?); END_FUNCTION </pre>

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函数	EXPRESS 描述
<p>曲线正权值 (IfcCurveWeights Positive)</p>	<pre> FUNCTION IfcCurveWeightsPositive (B: IfcRationalBSplineCurveWithKnots) : BOOLEAN; LOCAL Result : BOOLEAN := TRUE; END_LOCAL; REPEAT i := 0 TO B.UpperIndexOnControlPoints; IF B.Weights[i] <= 0.0 THEN Result := FALSE; RETURN(Result); END_IF; END_REPEAT; RETURN(Result); END_FUNCTION </pre>
<p>点积 (IfcDotProduct)</p>	<pre> FUNCTION IfcDotProduct (Arg1, Arg2 : IfcDirection) : REAL; LOCAL Scalar : REAL; Vec1, Vec2 : IfcDirection; Ndim : INTEGER; END_LOCAL; IF NOT EXISTS (Arg1) OR NOT EXISTS (Arg2) THEN Scalar := ?; ELSE IF (Arg1.Dim <> Arg2.Dim) THEN Scalar := ?; ELSE BEGIN Vec1 := IfcNormalise(Arg1); Vec2 := IfcNormalise(Arg2); Ndim := Arg1.Dim; Scalar := 0.0; REPEAT i := 1 TO Ndim; Scalar := Scalar + Vec1.DirectionRatios[i] * Vec2.DirectionRatios[i]; END_REPEAT; END; END_IF; END_IF; RETURN (Scalar); END_FUNCTION </pre>
<p>第一投影轴 (IfcFirstProjAxis)</p>	<pre> FUNCTION IfcFirstProjAxis (ZAxis, Arg : IfcDirection) : IfcDirection; LOCAL XAxis : IfcDirection; V : IfcDirection; Z : IfcDirection; XVec : IfcVector; END_LOCAL; IF (NOT EXISTS(ZAxis)) THEN RETURN (?); ELSE Z := IfcNormalise(ZAxis); IF NOT EXISTS(Arg) THEN IF (Z.DirectionRatios <> [1.0,0.0,0.0]) THEN </pre>

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<p>第一投影轴 (IfcFirstProjAxis)</p>	<pre> V := IfcRepresentationItem() IfcGeometricRepresentationItem () IfcDirection([1.0,0.0,0.0]); ELSE V := IfcRepresentationItem() IfcGeometricRepresentationItem () IfcDirection([0.0,1.0,0.0]); END_IF; ELSE IF (Arg. Dim <> 3) THEN RETURN (?); END_IF; IF ((IfcCrossProduct(Arg,Z). Magnitude) = 0.0) THEN RETURN (?); ELSE V := IfcNormalise(Arg); END_IF; END_IF; XVec := IfcScalarTimesVector(IfcDotProduct(V, Z), Z); XAxis := IfcVectorDifference(V, XVec). Orientation; XAxis := IfcNormalise(XAxis); END_IF; RETURN(XAxis); END_FUNCTION </pre>
<p>取基曲面 (IfcGetBasisSurface)</p>	<pre> FUNCTION IfcGetBasisSurface (C : IfcCurveOnSurface) : SET[0:2] OF IfcSurface; LOCAL Surfs : SET[0:2] OF IfcSurface; N : INTEGER; END_LOCAL; Surfs := []; IF 'IFCGEOMETRYRESOURCE. IFPCURVE' IN TYPEOF (C) THEN Surfs := [C\IfcCurve. BasisSurface]; ELSE IF 'IFCGEOMETRYRESOURCE. IFCCOMPOSITECURVEONSURFACE' IN TYPEOF (C) THEN (* For an IfcCompositeCurveOnSurface the BasisSurface is the intersection of the BasisSurface of all the segments *) N := SIZEOF(C\IfcCompositeCurve. Segments); Surfs := IfcGetBasisSurface(C\IfcCompositeCurve. Segments[1]. ParentCurve); IF N > 1 THEN REPEAT i := 2 TO N; Surfs := Surfs * IfcGetBasisSurface(C\IfcCompositeCurve. Segments[1]. ParentCurve); END_REPEAT; END_IF; END_IF; RETURN(Surfs); END_FUNCTION </pre>
<p>列表到数组 (IfcListToArray)</p>	<pre> FUNCTION IfcListToArray (Lis : LIST [0:?] OF GENERIC : T; Low,U : INTEGER) : ARRAY OF GENERIC : T; LOCAL N : INTEGER; Res : ARRAY [Low:U] OF GENERIC : T; END_LOCAL; N := SIZEOF(Lis); IF (N <> (U-Low +1)) THEN RETURN(?); ELSE Res := [Lis[1] : N]; REPEAT i := 2 TO N; Res[Low+i-1] := Lis[i]; END_REPEAT; RETURN(Res); END_IF; END_FUNCTION </pre>

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函数	EXPRESS 描述
<p>生成数组的数组 (IfcMakeArray OfArray)</p>	<pre> FUNCTION IfcMakeArrayOfArray (Lis : LIST[1:?] OF LIST [1:?] OF GENERIC : T; Low1, U1, Low2, U2 : INTEGER); ARRAY [Low1:U1] OF ARRAY [Low2:U2] OF GENERIC : T; LOCAL Res : ARRAY[Low1:U1] OF ARRAY [Low2:U2] OF GENERIC : T; END_LOCAL; (* Check input dimensions for consistency *) IF (U1-Low1+1) <> SIZEOF(Lis) THEN RETURN (?); END_IF; IF (U2 - Low2 + 1) <> SIZEOF(Lis[1]) THEN RETURN (?); END_IF; (* Initialise Res with values from Lis[1] *) Res := [IfcListToArray(Lis[1], Low2, U2) : (U1-Low1 + 1)]; REPEAT i := 2 TO HIINDEX(Lis); IF (U2-Low2+1) <> SIZEOF(Lis[i]) THEN RETURN (?); END_IF; Res[Low1+i-1] := IfcListToArray(Lis[i], Low2, U2); END_REPEAT; RETURN (Res); END_FUNCTION </pre>
<p>正则化 (IfcNormalise)</p>	<pre> FUNCTION IfcNormalise (Arg : IfcVectorOrDirection) : IfcVectorOrDirection; LOCAL Ndim : INTEGER; V : IfcDirection := IfcRepresentationItem() IfcGeometricRepresentationItem () IfcDirection([1, .0.]); Vec : IfcVector := IfcRepresentationItem() IfcGeometricRepresentationItem () IfcVector (IfcRepresentationItem() IfcGeometricRepresentationItem () IfcDirection([1, .0.], 1.); Mag : REAL; Result : IfcVectorOrDirection := V; END_LOCAL; IF NOT EXISTS (Arg) THEN RETURN (?); ELSE IF 'IFCGEOMETRYRESOURCE.IFCVECTOR' IN TYPEOF(Arg) THEN BEGIN Ndim := Arg\IfcVector. Dim; V.DirectionRatios := Arg\IfcVector. Orientation. DirectionRatios; Vec.Magnitude := Arg\IfcVector. Magnitude; Vec.Orientation := V; IF Arg\IfcVector. Magnitude = 0.0 THEN RETURN(?); ELSE Vec.Magnitude := 1.0; END_IF; END; ELSE BEGIN Ndim := Arg\IfcDirection. Dim; </pre>

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<p>正则化 (IfcNormalise)</p>	<pre> V.DirectionRatios := Arg\IfcDirection.DirectionRatios; END; END_IF; Mag := 0.0; REPEAT i := 1 TO Ndim; Mag := Mag + V.DirectionRatios[i] * V.DirectionRatios[i]; END_REPEAT; IF Mag > 0.0 THEN Mag := SQRT(Mag); REPEAT i := 1 TO Ndim; V.DirectionRatios[i] := V.DirectionRatios[i]/Mag; END_REPEAT; IF 'IFCGEOMETRYRESOURCE.IFCVECTOR' IN TYPEOF(arg) THEN Vec.Orientation := V; Result := Vec; ELSE Result := V; END_IF; ELSE RETURN(?); END_IF; END_IF; RETURN (Result); END_FUNCTION </pre>
<p>正交补 (IfcOrthogonal Complement)</p>	<pre> FUNCTION IfcOrthogonalComplement (Vec : IfcDirection) : IfcDirection; LOCAL Result : IfcDirection ; END_LOCAL; IF NOT EXISTS (Vec) OR (Vec.Dim <> 2) THEN RETURN(?); ELSE Result := IfcRepresentationItem () IfcGeometricRepresentationItem () IfcDirection ([- Vec.DirectionRatios[2], Vec.DirectionRatios[1]]); RETURN(Result); END_IF; END_FUNCTION </pre>
<p>同轴 2 方位类型 (IfcSameAxis2 Placement)</p>	<pre> FUNCTION IfcSameAxis2Placement (ap1, ap2 : IfcAxis2Placement; Epsilon : REAL) : LOGICAL ; RETURN (IfcSameDirection(ap1.P[1],ap2.P[1],Epsilon) AND IfcSameDirection(ap1.P[2],ap2.P[2],Epsilon) AND IfcSameCartesianPoint(ap1.Location,ap1.Location,Epsilon)); END_FUNCTION </pre>
<p>同笛卡尔点 (IfcSameCartesian Point)</p>	<pre> FUNCTION IfcSameCartesianPoint (cp1, cp2 : IfcCartesianPoint; Epsilon : REAL) : LOGICAL; LOCAL cp1x : REAL := cp1.Coordinates[1]; cp1y : REAL := cp1.Coordinates[2]; cp1z : REAL := 0; cp2x : REAL := cp2.Coordinates[1]; cp2y : REAL := cp2.Coordinates[2]; cp2z : REAL := 0; </pre>

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函数	EXPRESS 描述
<p>同笛卡尔点 (IfcSameCartesian Point)</p>	<pre> END_LOCAL; IF (SIZEOF(cp1.Coordinates) > 2) THEN cp1z := cp1.Coordinates[3]; END_IF; IF (SIZEOF(cp2.Coordinates) > 2) THEN cp2z := cp2.Coordinates[3]; END_IF; RETURN (IfcSameValue(cp1x,cp2x,Epsilon) AND IfcSameValue(cp1y,cp2y,Epsilon) AND IfcSameValue(cp1z,cp2z,Epsilon)); END_FUNCTION </pre>
<p>同方向 (IfcSameDirection)</p>	<pre> FUNCTION IfcSameDirection (dir1, dir2 : IfcDirection; Epsilon : REAL) : LOGICAL; LOCAL dir1x : REAL := dir1.DirectionRatios[1]; dir1y : REAL := dir1.DirectionRatios[2]; dir1z : REAL := 0; dir2x : REAL := dir2.DirectionRatios[1]; dir2y : REAL := dir2.DirectionRatios[2]; dir2z : REAL := 0; END_LOCAL; IF (SIZEOF(dir1.DirectionRatios) > 2) THEN dir1z := dir1.DirectionRatios[3]; END_IF; IF (SIZEOF(dir2.DirectionRatios) > 2) THEN dir2z := dir2.DirectionRatios[3]; END_IF; RETURN (IfcSameValue(dir1x,dir2x,Epsilon) AND IfcSameValue(dir1y,dir2y,Epsilon) AND IfcSameValue(dir1z,dir2z,Epsilon)); END_FUNCTION </pre>
<p>等值 (IfcSameValue)</p>	<pre> FUNCTION IfcSameValue (Value1, Value2 : REAL; Epsilon : REAL) : LOGICAL; LOCAL ValidEps : REAL; DefaultEps : REAL := 0.000001; END_LOCAL; ValidEps := NVL(Epsilon, DefaultEps); RETURN ((Value1 + ValidEps > Value2) AND (Value1 < Value2 + ValidEps)); END_FUNCTION </pre>
<p>标量乘矢量 (IfcScalarTimesVector)</p>	<pre> FUNCTION IfcScalarTimesVector (Scalar : REAL; Vec : IfcVectorOrDirection) : IfcVector; LOCAL V : IfcDirection; Mag : REAL; Result : IfcVector; END_LOCAL; IF NOT EXISTS (Scalar) OR NOT EXISTS (Vec) THEN </pre>

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函数	EXPRESS 描述
<p>标量乘矢量 (IfcScalarTimesVector)</p>	<pre> RETURN (?); ELSE IF'IFCGEOMETRYRESOURCE.IFCVECTOR'IN TYPEOF (Vec) THEN V := Vec\IfcVector.Orientation; Mag := Scalar * Vec\IfcVector.Magnitude; ELSE V := Vec; Mag := Scalar; END_IF; END_IF; IF (Mag < 0.0) THEN REPEAT i := 1 TO SIZEOF(V.DirectionRatios); V.DirectionRatios[i] := -V.DirectionRatios[i]; END_REPEAT; Mag := -Mag; END_IF; Result := IfcRepresentationItem() IfcGeometricRepresentationItem() IfcVector(IfcNormalise (V), Mag); END_IF; RETURN (Result); END_FUNCTION </pre>
<p>第二投影轴 (IfcSecondProjAxis)</p>	<pre> FUNCTION IfcSecondProjAxis (ZAxis, XAxis, Arg: IfcDirection) : IfcDirection; LOCAL YAxis : IfcVector; V : IfcDirection; Temp : IfcVector; END_LOCAL; IF NOT EXISTS(Arg) THEN V := IfcRepresentationItem() IfcGeometricRepresentationItem() IfcDirection([0.0,1.0,0.0]); ELSE V := Arg; END_IF; Temp := IfcScalarTimesVector(IfcDotProduct(V, ZAxis), ZAxis); YAxis := IfcVectorDifference(V, Temp); Temp := IfcScalarTimesVector(IfcDotProduct(V, XAxis), XAxis); YAxis := IfcVectorDifference(YAxis, Temp); YAxis := IfcNormalise(YAxis); RETURN(YAxis.Orientation); END_FUNCTION </pre>
<p>曲面正权值 (IfcSurfaceWeights Positive)</p>	<pre> FUNCTION IfcSurfaceWeightsPositive (B: IfcRationalBSplineSurfaceWithKnots) : BOOLEAN; LOCAL Result : BOOLEAN := TRUE; END_LOCAL; REPEAT i := 0 TO B\IfcBSplineSurface.UUpper; REPEAT j := 0 TO B\IfcBSplineSurface.VUpper; IF (B.Weights[i][j] <= 0.0) THEN Result := FALSE; RETURN(Result); END_IF; END_REPEAT; END_REPEAT; RETURN(Result); END_FUNCTION </pre>

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函数	EXPRESS 描述
<p>向量差 (IfcVectorDifference)</p>	<pre> FUNCTION IfcVectorDifference (Arg1, Arg2 : IfcVectorOrDirection) : IfcVector; LOCAL Result : IfcVector; Res, Vec1, Vec2 : IfcDirection; Mag, Mag1, Mag2 : REAL; Ndim : INTEGER; END_LOCAL; IF ((NOT EXISTS (Arg1)) OR (NOT EXISTS (Arg2))) OR (Arg1. Dim <> Arg2. Dim) THEN RETURN (?); ELSE BEGIN IF 'IFCGEOMETRYRESOURCE. IFCVECTOR' IN TYPEOF(Arg1) THEN Mag1 := Arg1\IfcVector. Magnitude; Vec1 := Arg1\IfcVector. Orientation; ELSE Mag1 := 1. 0; Vec1 := Arg1; END_IF; IF 'IFCGEOMETRYRESOURCE. IFCVECTOR' IN TYPEOF(Arg2) THEN Mag2 := Arg2\IfcVector. Magnitude; Vec2 := Arg2\IfcVector. Orientation; ELSE Mag2 := 1. 0; Vec2 := Arg2; END_IF; Vec1 := IfcNormalise (Vec1); Vec2 := IfcNormalise (Vec2); Ndim := SIZEOF(Vec1. DirectionRatios); Mag := 0. 0; Res := IfcRepresentationItem () IfcGeometricRepresentationItem () IfcDirection ([0. 0; Ndim]); REPEAT i := 1 TO Ndim; Res. DirectionRatios[i] := Mag1 * Vec1. DirectionRatios[i] - Mag2 * Vec2. DirectionRatios[i]; Mag := Mag + (Res. DirectionRatios[i] * Res. DirectionRatios[i]); END_REPEAT; IF (Mag > 0. 0) THEN Result := IfcRepresentationItem () IfcGeometricRepresentationItem () IfcVector (Res, SQRT(Mag)); ELSE Result := IfcRepresentationItem () IfcGeometricRepresentationItem () IfcVector (Vec1, 0. 0); END_IF; END; END_IF; RETURN (Result); END_FUNCTION </pre>
<p>向量和 (IfcVectorSum)</p>	<pre> FUNCTION IfcVectorSum (Arg1, Arg2 : IfcVectorOrDirection) : IfcVector; LOCAL Result : IfcVector; Res, Vec1, Vec2 : IfcDirection; Mag, Mag1, Mag2 : REAL; Ndim : INTEGER; END_LOCAL; IF ((NOT EXISTS (Arg1)) OR (NOT EXISTS (Arg2))) OR (Arg1. Dim <> Arg2. Dim) THEN </pre>

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函数	EXPRESS 描述
矢量和 (IfcVectorSum)	<pre> RETURN (?); ELSE BEGIN IF 'IFCGEOMETRYRESOURCE. IFCVECTOR' IN TYPEOF(Arg1) THEN Mag1 := Arg1\IfcVector. Magnitude; Vec1 := Arg1\IfcVector. Orientation; ELSE Mag1 := 1.0; Vec1 := Arg1; END_IF; IF 'IFCGEOMETRYRESOURCE. IFCVECTOR' IN TYPEOF(Arg2) THEN Mag2 := Arg2\IfcVector. Magnitude; Vec2 := Arg2\IfcVector. Orientation; ELSE Mag2 := 1.0; Vec2 := Arg2; END_IF; Vec1 := IfcNormalise (Vec1); Vec2 := IfcNormalise (Vec2); Ndim := SIZEOF(Vec1. DirectionRatios); Mag := 0.0; Res := IfcRepresentationItem() IfcGeometricRepresentationItem() IfcDirection([0.0; Ndim]); REPEAT i := 1 TO Ndim; Res. DirectionRatios[i] := Mag1 * Vec1. DirectionRatios[i] + Mag2 * Vec2. DirectionRatios[i]; Mag := Mag + (Res. DirectionRatios[i] * Res. DirectionRatios[i]); END_REPEAT; IF (Mag > 0.0) THEN Result := IfcRepresentationItem() IfcGeometricRepresentationItem() IfcVector(Res, SQRT(Mag)); ELSE Result := IfcRepresentationItem() IfcGeometricRepresentationItem() IfcVector(Vec1, 0.0); END_IF; END; END_IF; RETURN (Result); END_FUNCTION </pre>

D. 10 材料资源

D. 10. 1 材料资源类型的 EXPRESS 描述应按表 D. 10. 1 的规定采用。

表 D. 10. 1 材料资源类型的 EXPRESS 描述

类型	EXPRESS 描述
基点参考 (IfcCardinalPoint Reference)	<pre> TYPE IfcCardinalPointReference = INTEGER; WHERE GreaterThanZero : SELF > 0 END_TYPE </pre>
方向指向枚举 (IfcDirectionSense Enum)	<pre> TYPE IfcDirectionSenseEnum = ENUMERATION OF (POSITIVE, NEGATIVE); END_TYPE </pre>
层集方向枚举 (IfcLayerSetDirection Enum)	<pre> TYPE IfcLayerSetDirectionEnum = ENUMERATION OF (AXIS1, AXIS2, AXIS3); END_TYPE </pre>

续表 D.10.1

类型	EXPRESS 描述
材料选择 (IfcMaterialSelect)	TYPE IfcMaterialSelect = SELECT (IfcMaterialUsageDefinition, IfcMaterialDefinition, IfcMaterialList); END_TYPE

D.10.2 材料资源实体的 EXPRESS 描述应按表 D.10.2 的规定采用。

表 D.10.2 材料资源实体的 EXPRESS 描述

实体	EXPRESS 描述
材料 (IfcMaterial)	ENTITY IfcMaterial SUBTYPE OF IfcMaterialDefinition; Name : IfcLabel; Description : OPTIONAL IfcText; Category : OPTIONAL IfcLabel; INVERSE HasRepresentation : SET [0:1] OF IfcMaterialDefinitionRepresentation FOR RepresentedMaterial; IsRelatedWith : SET OF IfcMaterialRelationship FOR RelatedMaterials; RelatesTo : SET [0:1] OF IfcMaterialRelationship FOR RelatingMaterial; END_ENTITY
材料分类关系 (IfcMaterial Classification Relationship)	ENTITY IfcMaterialClassificationRelationship; MaterialClassifications : SET [1:?] OF IfcClassificationSelect; ClassifiedMaterial : IfcMaterial; END_ENTITY
材料成分 (IfcMaterial Constituent)	ENTITY IfcMaterialConstituent SUBTYPE OF IfcMaterialDefinition; Name : OPTIONAL IfcLabel; Description : OPTIONAL IfcText; Material : IfcMaterial; Fraction : OPTIONAL IfcNormalisedRatioMeasure; Category : OPTIONAL IfcLabel; INVERSE ToMaterialConstituentSet : IfcMaterialConstituentSet FOR MaterialConstituents; END_ENTITY
材料成分集 (IfcMaterial ConstituentSet)	ENTITY IfcMaterialConstituentSet SUBTYPE OF IfcMaterialDefinition; Name : OPTIONAL IfcLabel; Description : OPTIONAL IfcText; MaterialConstituents : OPTIONAL SET [1:?] OF IfcMaterialConstituent; END_ENTITY
材料定义 (IfcMaterialDefinition)	ENTITY IfcMaterialDefinition ABSTRACT SUPERTYPE OF(ONEOF(IfcMaterial, IfcMaterialConstituent, IfcMaterialConstituentSet, IfcMaterialLayer, IfcMaterialLayerSet, IfcMaterialProfile, IfcMaterialProfileSet)); INVERSE AssociatedTo : SET [0:?] OF IfcRelAssociatesMaterial FOR RelatingMaterial; HasExternalReferences : SET OF IfcExternalReferenceRelationship FOR RelatedResourceObjects; HasProperties : SET OF IfcMaterialProperties FOR Material; END_ENTITY
材料层 (IfcMaterialLayer)	ENTITY IfcMaterialLayer SUPERTYPE OF(IfcMaterialLayerWithOffsets) SUBTYPE OF IfcMaterialDefinition; Material : OPTIONAL IfcMaterial; LayerThickness : IfcNonNegativeLengthMeasure; IsVentilated : OPTIONAL IfcLogical; Name : OPTIONAL IfcLabel; Description : OPTIONAL IfcText; Category : OPTIONAL IfcLabel; Priority : OPTIONAL IfcNormalisedRatioMeasure; INVERSE ToMaterialLayerSet : IfcMaterialLayerSet FOR MaterialLayers; END_ENTITY

续表 D. 10. 2

实体	EXPRESS 描述
材料层集 (IfcMaterialLayerSet)	ENTITY IfcMaterialLayerSet SUBTYPE OF IfcMaterialDefinition; MaterialLayers : LIST [1:?] OF IfcMaterialLayer; LayerSetName : OPTIONAL IfcLabel; Description : OPTIONAL IfcText; DERIVE TotalThickness : IfcLengthMeasure := IfcMlsTotalThickness(SELF); END_ENTITY
材料层集用法 (IfcMaterialLayerSetUsage)	ENTITY IfcMaterialLayerSetUsage SUBTYPE OF IfcMaterialUsageDefinition; ForLayerSet : IfcMaterialLayerSet; LayerSetDirection : IfcLayerSetDirectionEnum; DirectionSense : IfcDirectionSenseEnum; OffsetFromReferenceLine : IfcLengthMeasure; ReferenceExtent : OPTIONAL IfcPositiveLengthMeasure; END_ENTITY
偏置材料层集 (IfcMaterialLayerWithOffsets)	ENTITY IfcMaterialLayerWithOffsets SUBTYPE OF IfcMaterialLayer; OffsetDirection : IfcLayerSetDirectionEnum; OffsetValues : ARRAY [1:2] OF IfcLengthMeasure; END_ENTITY
材料列表 (IfcMaterialList)	ENTITY IfcMaterialList; Materials : LIST [1:?] OF IfcMaterial; END_ENTITY
材料截面 (IfcMaterialProfile)	ENTITY IfcMaterialProfile SUPERTYPE OF (IfcMaterialProfileWithOffsets) SUBTYPE OF IfcMaterialDefinition; Name : OPTIONAL IfcLabel; Description : OPTIONAL IfcText; Material : OPTIONAL IfcMaterial; Profile : IfcProfileDef; Priority : OPTIONAL IfcNormalisedRatioMeasure; Category : OPTIONAL IfcLabel; INVERSE ToMaterialProfileSet : IfcMaterialProfileSet FOR MaterialProfiles; END_ENTITY
材料截面集 (IfcMaterialProfileSet)	ENTITY IfcMaterialProfileSet SUBTYPE OF IfcMaterialDefinition; Name : OPTIONAL IfcLabel; Description : OPTIONAL IfcText; MaterialProfiles : LIST [1:?] OF IfcMaterialProfile; CompositeProfile : OPTIONAL IfcCompositeProfileDef; END_ENTITY
材料截面集用法 (IfcMaterialProfileSetUsage)	ENTITY IfcMaterialProfileSetUsage SUPERTYPE OF (IfcMaterialProfileSetUsageTapering) SUBTYPE OF IfcMaterialUsageDefinition; ForProfileSet : IfcMaterialProfileSet; CardinalPoint : OPTIONAL IfcCardinalPointReference; ReferenceExtent : OPTIONAL IfcPositiveLengthMeasure; END_ENTITY
锥形材料截面 层集用法 (IfcMaterialProfileSetUsageTapering)	ENTITY IfcMaterialProfileSetUsageTapering SUBTYPE OF IfcMaterialProfileSetUsage; ForProfileEndSet : IfcMaterialProfileSet; CardinalEndPoint : OPTIONAL IfcCardinalPointReference; END_ENTITY

续表 D.10.2

实体	EXPRESS 描述
偏置材料截面 (IfcMaterialProfile WithOffsets)	ENTITY IfcMaterialProfileWithOffsets SUBTYPE OF IfcMaterialProfile; OffsetValues : ARRAY [1:2] OF IfcLengthMeasure; END_ENTITY
材料属性 (IfcMaterial Properties)	ENTITY IfcMaterialProperties SUBTYPE OF IfcExtendedProperties; Material : IfcMaterialDefinition; END_ENTITY
材料关系 (IfcMaterial Relationship)	ENTITY IfcMaterialRelationship SUBTYPE OF IfcResourceLevelRelationship; RelatingMaterial : IfcMaterial; RelatedMaterials : SET [1:?] OF IfcMaterial; EXPRESSION : OPTIONAL IfcLabel; END_ENTITY
材料用法定义 (IfcMaterialUsage Definition)	ENTITY IfcMaterialUsageDefinition ABSTRACT SUPERTYPE OF (ONEOF (IfcMaterialLayerSetUsage, IfcMaterialProfileSetUsage)); INVERSE AssociatedTo : SET [1:?] OF IfcRelAssociatesMaterial FOR RelatingMaterial; END_ENTITY

D.10.3 材料资源应采用层集总厚度函数,函数的 EXPRESS 描述应符合下列规定:

FUNCTION IfcMlsTotalThickness

(LayerSet : IfcMaterialLayerSet) : IfcLengthMeasure;

LOCAL

Max : IfcLengthMeasure := LayerSet.MaterialLayers[1].LayerThickness;

END_LOCAL;

IF SIZEOF(LayerSet.MaterialLayers) > 1 THEN

REPEAT i := 2 TO HINDEX(LayerSet.MaterialLayers);

Max := Max + LayerSet.MaterialLayers[i].LayerThickness;

END_REPEAT;

END_IF;

RETURN (Max);

END_FUNCTION

D.11 度量资源

D.11.1 度量资源类型的 EXPRESS 描述应按表 D.11.1 的规定采用。

表 D.11.1 度量资源类型的 EXPRESS 描述

类型	EXPRESS 描述
放射性剂量度量 (IfcAbsorbedDose Measure)	TYPE IfcAbsorbedDoseMeasure = REAL; END_TYPE
加速度度量 (IfcAcceleration Measure)	TYPE IfcAccelerationMeasure = REAL; END_TYPE
物质质量度量 (IfcAmountOf SubstanceMeasure)	TYPE IfcAmountOfSubstanceMeasure = REAL; END_TYPE

续表 D. 11. 1

类型	EXPRESS 描述
角速度度量 (IfcAngularVelocityMeasure)	TYPE IfcAngularVelocityMeasure = REAL; END_TYPE
二维密度度量 (IfcAreaDensityMeasure)	TYPE IfcAreaDensityMeasure = REAL; END_TYPE
面积度量 (IfcAreaMeasure)	TYPE IfcAreaMeasure = REAL; END_TYPE
布尔 (IfcBoolean)	TYPE IfcBoolean = BOOLEAN; END_TYPE
复数 (IfcComplexNumber)	TYPE IfcComplexNumber = ARRAY [1:2] OF REAL; END_TYPE
合成平面角度度量 (IfcCompoundPlaneAngleMeasure)	TYPE IfcCompoundPlaneAngleMeasure = LIST [3:4] OF INTEGER; WHERE MinutesInRange : ABS(SELF[2]) < 60 SecondsInRange : ABS(SELF[3]) < 60 MicrosecondsInRange : (SIZEOF(SELF) = 3) OR (ABS(SELF[4]) < 1000000) ConsistentSign : ((SELF[1] >= 0) AND (SELF[2] >= 0) AND (SELF[3] >= 0) AND ((SIZEOF(SELF) = 3) OR (SELF[4] >= 0))) OR ((SELF[1] <= 0) AND (SELF[2] <= 0) AND (SELF[3] <= 0) AND ((SIZEOF(SELF) = 3) OR (SELF[4] <= 0))) END_TYPE
环境相关度量 (IfcContextDependentMeasure)	TYPE IfcContextDependentMeasure = REAL; END_TYPE
计数度量 (IfcCountMeasure)	TYPE IfcCountMeasure = NUMBER; END_TYPE
曲率度量 (IfcCurvatureMeasure)	TYPE IfcCurvatureMeasure = REAL; END_TYPE
描述度量 (IfcDescriptiveMeasure)	TYPE IfcDescriptiveMeasure = STRING; END_TYPE
剂量等价物度量 (IfcDoseEquivalentMeasure)	TYPE IfcDoseEquivalentMeasure = REAL; END_TYPE
动力黏性度量 (IfcDynamicViscosityMeasure)	TYPE IfcDynamicViscosityMeasure = REAL; END_TYPE
电容度量 (IfcElectricCapacitanceMeasure)	TYPE IfcElectricCapacitanceMeasure = REAL; END_TYPE
电荷度量 (IfcElectricChargeMeasure)	TYPE IfcElectricChargeMeasure = REAL; END_TYPE
电导率度量 (IfcElectricConductanceMeasure)	TYPE IfcElectricConductanceMeasure = REAL; END_TYPE
电流度量 (IfcElectricCurrentMeasure)	TYPE IfcElectricCurrentMeasure = REAL; END_TYPE
电阻度量 (IfcElectricResistanceMeasure)	TYPE IfcElectricResistanceMeasure = REAL; END_TYPE
电压度量 (IfcElectricVoltageMeasure)	TYPE IfcElectricVoltageMeasure = REAL; END_TYPE

续表 D.11.1

类型	EXPRESS 描述
能量度量 (IfcEnergyMeasure)	TYPE IfcEnergyMeasure = REAL; END_TYPE
力度量 (IfcForceMeasure)	TYPE IfcForceMeasure = REAL; END_TYPE
频率度量 (IfcFrequencyMeasure)	TYPE IfcFrequencyMeasure = REAL; END_TYPE
热流量密度度量 (IfcHeatFluxDensityMeasure)	TYPE IfcHeatFluxDensityMeasure = REAL; END_TYPE
热值度量 (IfcHeatingValueMeasure)	TYPE IfcHeatingValueMeasure = REAL; WHERE WR1 : SELF > 0 END_TYPE
标识符 (IfcIdentifier)	TYPE IfcIdentifier = STRING (255); END_TYPE
照明度量 (IfcIlluminanceMeasure)	TYPE IfcIlluminanceMeasure = REAL; END_TYPE
热感应系数度量 (IfcInductanceMeasure)	TYPE IfcInductanceMeasure = REAL; END_TYPE
整数 (IfcInteger)	TYPE IfcInteger = INTEGER; END_TYPE
整数速率度量 (IfcIntegerCountRateMeasure)	TYPE IfcIntegerCountRateMeasure = INTEGER; END_TYPE
离子浓度度量 (IfcIonConcentrationMeasure)	TYPE IfcIonConcentrationMeasure = REAL; END_TYPE
等温湿度度量 (IfcIsothermalMoistureCapacityMeasure)	TYPE IfcIsothermalMoistureCapacityMeasure = REAL; END_TYPE
运动黏性度量 (IfcKinematicViscosityMeasure)	TYPE IfcKinematicViscosityMeasure = REAL; END_TYPE
标签 (IfcLabel)	TYPE IfcLabel = STRING (255); END_TYPE
长度度量 (IfcLengthMeasure)	TYPE IfcLengthMeasure = REAL; END_TYPE
线荷载度量 (IfcLinearForceMeasure)	TYPE IfcLinearForceMeasure = REAL; END_TYPE
线性力矩度量 (IfcLinearMomentMeasure)	TYPE IfcLinearMomentMeasure = REAL; END_TYPE
线刚度度量 (IfcLinearStiffnessMeasure)	TYPE IfcLinearStiffnessMeasure = REAL; END_TYPE
直线速度度量 (IfcLinearVelocityMeasure)	TYPE IfcLinearVelocityMeasure = REAL; END_TYPE
逻辑 (IfcLogical)	TYPE IfcLogical = LOGICAL; END_TYPE

续表 D. 11. 1

类型	EXPRESS 描述
光通量度量 (IfcLuminousFluxMeasure)	TYPE IfcLuminousFluxMeasure = REAL; END_TYPE
光强分布度量 (IfcLuminousIntensityDistributionMeasure)	TYPE IfcLuminousIntensityDistributionMeasure = REAL; END_TYPE
光强度量 (IfcLuminousIntensityMeasure)	TYPE IfcLuminousIntensityMeasure = REAL; END_TYPE
磁感应强度度量 (IfcMagneticFluxDensityMeasure)	TYPE IfcMagneticFluxDensityMeasure = REAL; END_TYPE
磁通量度量 (IfcMagneticFluxMeasure)	TYPE IfcMagneticFluxMeasure = REAL; END_TYPE
密度度量 (IfcMassDensityMeasure)	TYPE IfcMassDensityMeasure = REAL; END_TYPE
流速度量 (IfcMassFlowRateMeasure)	TYPE IfcMassFlowRateMeasure = REAL; END_TYPE
质量度量 (IfcMassMeasure)	TYPE IfcMassMeasure = REAL; END_TYPE
单位长度质量度量 (IfcMassPerLengthMeasure)	TYPE IfcMassPerLengthMeasure = REAL; END_TYPE
弹性模量度量 (IfcModulusOfElasticityMeasure)	TYPE IfcModulusOfElasticityMeasure = REAL; END_TYPE
地基反应线性模量度量 (IfcModulusOfLinearSubgradeReactionMeasure)	TYPE IfcModulusOfLinearSubgradeReactionMeasure = REAL; END_TYPE
地基反应转动模量度量 (IfcModulusOfRotationalSubgradeReactionMeasure)	TYPE IfcModulusOfRotationalSubgradeReactionMeasure = REAL; END_TYPE
地基反力系数度量 (IfcModulusOfSubgradeReactionMeasure)	TYPE IfcModulusOfSubgradeReactionMeasure = REAL; END_TYPE
潮湿扩散率度量 (IfcModulusOfSubgradeReactionMeasure)	TYPE IfcMoistureDiffusivityMeasure = REAL; END_TYPE
分子重量度量 (IfcMolecularWeightMeasure)	TYPE IfcMolecularWeightMeasure = REAL; END_TYPE
惯性矩度量 (IfcMomentOfInertiaMeasure)	TYPE IfcMomentOfInertiaMeasure = REAL; END_TYPE
货币值度量 (IfcMonetaryMeasure)	TYPE IfcMonetaryMeasure = REAL; END_TYPE

续表 D.11.1

类型	EXPRESS 描述
非负长度度量 (IfcNonNegativeLengthMeasure)	TYPE IfcNonNegativeLengthMeasure = IfcLengthMeasure; WHERE NotNegative : SELF >= 0 END_TYPE
正则比例度量 (IfcNormalisedRatioMeasure)	TYPE IfcNormalisedRatioMeasure = IfcRatioMeasure; WHERE WR1 : {0.0 <= SELF <= 1.0} END_TYPE
数字度量 (IfcNumericMeasure)	TYPE IfcNumericMeasure = NUMBER; END_TYPE
参数值 (IfcParameterValue)	TYPE IfcParameterValue = REAL; END_TYPE
pH 值度量 (IfcPHMeasure)	TYPE IfcPHMeasure = REAL; WHERE WR21 : {0.0 <= SELF <= 14.0} END_TYPE
面荷载度量 (IfcPlanarForceMeasure)	TYPE IfcPlanarForceMeasure = REAL; END_TYPE
平面角度度量 (IfcPlaneAngleMeasure)	TYPE IfcPlaneAngleMeasure = REAL; END_TYPE
正长度度量 (IfcPositiveLengthMeasure)	TYPE IfcPositiveLengthMeasure = IfcLengthMeasure; WHERE WR1 : SELF > 0 END_TYPE
正平面角度度量 (IfcPositivePlaneAngleMeasure)	TYPE IfcPositivePlaneAngleMeasure = IfcPlaneAngleMeasure; WHERE WR1 : SELF > 0 END_TYPE
正比例度量 (IfcPositiveRatioMeasure)	TYPE IfcPositiveRatioMeasure = IfcRatioMeasure; WHERE WR1 : SELF > 0 END_TYPE
功率度量 (IfcPowerMeasure)	TYPE IfcPowerMeasure = REAL; END_TYPE
压强度量 (IfcPressureMeasure)	TYPE IfcPressureMeasure = REAL; END_TYPE
反射性强度度量 (IfcRadioActivityMeasure)	TYPE IfcRadioActivityMeasure = REAL; END_TYPE
比例度量 (IfcRatioMeasure)	TYPE IfcRatioMeasure = REAL; END_TYPE
实数 (IfcReal)	TYPE IfcReal = REAL; END_TYPE
转动频率度量 (IfcRotationalFrequencyMeasure)	TYPE IfcRotationalFrequencyMeasure = REAL; END_TYPE
转动质量度量 (IfcRotationalMassMeasure)	TYPE IfcRotationalMassMeasure = REAL; END_TYPE
转动刚度度量 (IfcRotationalStiffnessMeasure)	TYPE IfcRotationalStiffnessMeasure = REAL; END_TYPE

续表 D. 11. 1

类型	EXPRESS 描述
截面积度量 (IfcSectionalAreaIntegralMeasure)	TYPE IfcSectionalAreaIntegralMeasure = REAL; END_TYPE
截面模量度量 (IfcSectionModulusMeasure)	TYPE IfcSectionModulusMeasure = REAL; END_TYPE
剪切模量度量 (IfcShearModulusMeasure)	TYPE IfcShearModulusMeasure = REAL; END_TYPE
立体角度度量 (IfcSolidAngleMeasure)	TYPE IfcSolidAngleMeasure = REAL; END_TYPE
声功率级度量 (IfcSoundPowerLevelMeasure)	TYPE IfcSoundPowerLevelMeasure = REAL; END_TYPE
声功率度量 (IfcSoundPowerMeasure)	TYPE IfcSoundPowerMeasure = REAL; END_TYPE
声压级度量 (IfcSoundPressureLevelMeasure)	TYPE IfcSoundPressureLevelMeasure = REAL; END_TYPE
声压度量 (IfcSoundPressureMeasure)	TYPE IfcSoundPressureMeasure = REAL; END_TYPE
比热度量 (IfcSpecificHeatCapacityMeasure)	TYPE IfcSpecificHeatCapacityMeasure = REAL; END_TYPE
温度梯度度量 (IfcTemperatureGradientMeasure)	TYPE IfcTemperatureGradientMeasure = REAL; END_TYPE
温度变化率度量 (IfcTemperatureRateOfChangeMeasure)	TYPE IfcTemperatureRateOfChangeMeasure = REAL; END_TYPE
文本 (IfcText)	TYPE IfcText = STRING; END_TYPE
热吸收度量 (IfcThermalAdmittanceMeasure)	TYPE IfcThermalAdmittanceMeasure = REAL; END_TYPE
导热性度量 (IfcThermalConductivityMeasure)	TYPE IfcThermalConductivityMeasure = REAL; END_TYPE
热胀系数度量 (IfcThermalExpansionCoefficientMeasure)	TYPE IfcThermalExpansionCoefficientMeasure = REAL; END_TYPE
热阻度量 (IfcThermalResistanceMeasure)	TYPE IfcThermalResistanceMeasure = REAL; END_TYPE
热传导度量 (IfcThermalTransmittanceMeasure)	TYPE IfcThermalTransmittanceMeasure = REAL; END_TYPE
热力学温度度量 (IfcThermodynamicTemperatureMeasure)	TYPE IfcThermodynamicTemperatureMeasure = REAL; END_TYPE
时间度量 (IfcTimeMeasure)	TYPE IfcTimeMeasure = REAL; END_TYPE

续表 D.11.1

类型	EXPRESS 描述
扭矩度量 (IfcTorqueMeasure)	TYPE IfcTorqueMeasure = REAL; END_TYPE
蒸汽渗透度量 (IfcVaporPermeabilityMeasure)	TYPE IfcVaporPermeabilityMeasure = REAL; END_TYPE
体积度量 (IfcVolumeMeasure)	TYPE IfcVolumeMeasure = REAL; END_TYPE
体积流速度量 (IfcVolumetricFlowRateMeasure)	TYPE IfcVolumetricFlowRateMeasure = REAL; END_TYPE
恒定翘曲度量 (IfcWarpingConstantMeasure)	TYPE IfcWarpingConstantMeasure = REAL; END_TYPE
扭曲力矩度量 (IfcWarpingMomentMeasure)	TYPE IfcWarpingMomentMeasure = REAL; END_TYPE
导出单位枚举 (IfcDerivedUnitEnum)	TYPE IfcDerivedUnitEnum = ENUMERATION OF ANGULARVELOCITYUNIT, AREADENSITYUNIT, COMPOUNDPLANEANGLEUNIT, DYNAMICVISCOSITYUNIT, HEATFLUXDENSITYUNIT, INTEGERCOUNTRATEUNIT, ISOTHERMALMOISTURECAPACITYUNIT, KINEMATICVISCOSITYUNIT, LINEARVELOCITYUNIT, MASSDENSITYUNIT, MASSFLOWRATEUNIT, MOISTUREDIFUSIVITYUNIT, MOLECULARWEIGHTUNIT, SPECIFICHEATCAPACITYUNIT, THERMALADMITTANCEUNIT, THERMALCONDUCTANCEUNIT, THERMALRESISTANCEUNIT, THERMALTRANSMITTANCEUNIT, VAPORPERMEABILITYUNIT, VOLUMETRICFLOWRATEUNIT, ROTATIONALFREQUENCYUNIT, TORQUEUNIT, MOMENTOFINERTIAUNIT, LINEARMOMENTUNIT, LINEARFORCEUNIT, PLANARFORCEUNIT, MODULUSOFELASTICITYUNIT, SHEARMODULUSUNIT, LINEARSTIFFNESSUNIT, ROTATIONALSTIFFNESSUNIT, MODULUSOFSUBGRADEREACTIONUNIT, ACCELERATIONUNIT, CURVATUREUNIT, HEATINGVALUEUNIT, IONCONCENTRATIONUNIT, LUMINOUSINTENSITYDISTRIBUTIONUNIT, MASSPERLENGTHUNIT, MODULUSOFLINEARSUBGRADEREACTIONUNIT, MODULUSOFROTATIONALSUBGRADEREACTIONUNIT, PHUNIT, ROTATIONALMASSUNIT, SECTIONAREAINTEGRALUNIT,

续表 D. 11. 1

类型	EXPRESS 描述
导出单位枚举 (IfcDerivedUnit Enum)	SECTIONMODULUSUNIT, SOUNDPOWERLEVELUNIT, SOUNDPOWERUNIT, SOUNDPRESSURELEVELUNIT, SOUNDPRESSUREUNIT, TEMPERATUREGRADIENTUNIT, TEMPERATURERATEOFCHANGEUNIT, THERMALEXPANSIONCOEFFICIENTUNIT, WARPINGCONSTANTUNIT, WARPINGMOMENTUNIT, USERDEFINED); END_TYPE
SI 前缀 (IfcSIPrefix)	TYPE IfcSIPrefix = ENUMERATION OF (EXA, PETA, TERA, GIGA, MEGA, KILO, HECTO, DECA, DECI, CENTI, MILLI, MICRO, NANO, PICO, FEMTO, ATTO); END_TYPE
国际单位制单位名称 (IfcSIUnitName)	TYPE IfcSIUnitName = ENUMERATION OF (AMPERE, BECQUEREL, CANDELA, COULOMB, CUBIC_METRE, DEGREE_CELSIUS, FARAD, GRAM, GRAY, HENRY, HERTZ, JOULE, KELVIN, LUMEN, LUX, METRE, MOLE, NEWTON, OHM, PASCAL, RADIAN, SECOND, SIEMENS, SIEVERT, SQUARE_METRE, STERADIAN, TESLA, VOLT, WATT, WEBER); END_TYPE

续表 D.11.1

类型	EXPRESS 描述
<p>单位枚举 (IfcUnitEnum)</p>	<p>TYPE IfcUnitEnum = ENUMERATION OF (ABSORBEDDOSEUNIT, AMOUNTOFSUBSTANCEUNIT, AREAUNIT, DOSEEQUIVALENTUNIT, ELECTRICCAPACITANCEUNIT, ELECTRICCHARGEUNIT, ELECTRICCONDUCTANCEUNIT, ELECTRICCURRENTUNIT, ELECTRICRESISTANCEUNIT, ELECTRICVOLTAGEUNIT, ENERGYUNIT, FORCEUNIT, FREQUENCYUNIT, ILLUMINANCEUNIT, INDUCTANCEUNIT, LENGTHUNIT, LUMINOUSFLUXUNIT, LUMINOUSINTENSITYUNIT, MAGNETICFLUXDENSITYUNIT, MAGNETICFLUXUNIT, MASSUNIT, PLANEANGLEUNIT, POWERUNIT, PRESSUREUNIT, RADIOACTIVITYUNIT, SOLIDANGLEUNIT, THERMODYNAMICTEMPERATUREUNIT, TIMEUNIT, VOLUMEUNIT, USERDEFINED); END_TYPE</p>
<p>导出度量值选择 (IfcDerivedMeasure Value)</p>	<p>TYPE IfcDerivedMeasureValue = SELECT (IfcVolumetricFlowRateMeasure, IfcThermalTransmittanceMeasure, IfcThermalResistanceMeasure, IfcThermalAdmittanceMeasure, IfcPressureMeasure, IfcPowerMeasure, IfcMassFlowRateMeasure, IfcMassDensityMeasure, IfcLinearVelocityMeasure, IfcKinematicViscosityMeasure, IfcIntegerCountRateMeasure, IfcHeatFluxDensityMeasure, IfcFrequencyMeasure, IfcEnergyMeasure, IfcElectricVoltageMeasure, IfcDynamicViscosityMeasure, IfcCompoundPlaneAngleMeasure, IfcAngularVelocityMeasure, IfcThermalConductivityMeasure, IfcMolecularWeightMeasure, IfcVaporPermeabilityMeasure, IfcMoistureDiffusivityMeasure, IfcIsothermalMoistureCapacityMeasure, IfcSpecificHeatCapacityMeasure, IfcMonetaryMeasure, IfcMagneticFluxDensityMeasure,</p>

续表 D. 11. 1

类型	EXPRESS 描述
<p>导出度量值选择 (IfcDerivedMeasure Value)</p>	<p>IfcMagneticFluxMeasure, IfcLuminousFluxMeasure, IfcForceMeasure, IfcInductanceMeasure, IfcIlluminanceMeasure, IfcElectricResistanceMeasure, IfcElectricConductanceMeasure, IfcElectricChargeMeasure, IfcDoseEquivalentMeasure, IfcElectricCapacitanceMeasure, IfcAbsorbedDoseMeasure, IfcRadioActivityMeasure, IfcRotationalFrequencyMeasure, IfcTorqueMeasure, IfcAccelerationMeasure, IfcLinearForceMeasure, IfcLinearStiffnessMeasure, IfcModulusOfSubgradeReactionMeasure, IfcModulusOfElasticityMeasure, IfcMomentOfInertiaMeasure, IfcPlanarForceMeasure, IfcRotationalStiffnessMeasure, IfcShearModulusMeasure, IfcLinearMomentMeasure, IfcLuminousIntensityDistributionMeasure, IfcCurvatureMeasure, IfcMassPerLengthMeasure, IfcModulusOfLinearSubgradeReactionMeasure, IfcModulusOfRotationalSubgradeReactionMeasure, IfcRotationalMassMeasure, IfcSectionalAreaIntegralMeasure, IfcSectionModulusMeasure, IfcTemperatureGradientMeasure, IfcThermalExpansionCoefficientMeasure, IfcWarpingConstantMeasure, IfcWarpingMomentMeasure, IfcSoundPowerMeasure, IfcSoundPressureMeasure, IfcHeatingValueMeasure, IfcPHMeasure, IfcIonConcentrationMeasure, IfcTemperatureRateOfChangeMeasure, IfcAreaDensityMeasure, IfcSoundPowerLevelMeasure, IfcSoundPressureLevelMeasure); END_TYPE</p>
<p>度量值选择 (IfcMeasureValue)</p>	<p>TYPE IfcMeasureValue = SELECT (IfcVolumeMeasure, IfcTimeMeasure, IfcThermodynamicTemperatureMeasure, IfcSolidAngleMeasure, IfcPositiveRatioMeasure, IfcRatioMeasure, IfcPositivePlaneAngleMeasure, IfcPlaneAngleMeasure, IfcParameterValue, IfcNumericMeasure, IfcMassMeasure, IfcPositiveLengthMeasure, IfcLengthMeasure, IfcElectricCurrentMeasure, IfcDescriptiveMeasure,</p>

续表 D.11.1

类型	EXPRESS 描述
度量值选择 (IfcMeasureValue)	IfcCountMeasure, IfcContextDependentMeasure, IfcAreaMeasure, IfcAmountOfSubstanceMeasure, IfcLuminousIntensityMeasure, IfcNormalisedRatioMeasure, IfcComplexNumber, IfcNonNegativeLengthMeasure); END_TYPE
简单值选择 (IfcSimpleValue)	TYPE IfcSimpleValue = SELECT (IfcInteger, IfcReal, IfcBoolean, IfcIdentifier, IfcText, IfcLabel, IfcLogical, IfcDateTime, IfcDate, IfcTime, IfcDuration, IfcTimeStamp); END_TYPE
单位量单位选择 (IfcUnit)	TYPE IfcUnit = SELECT (IfcDerivedUnit, IfcNamedUnit, IfcMonetaryUnit); END_TYPE
值选择 (IfcValue)	TYPE IfcValue = SELECT (IfcMeasureValue, IfcSimpleValue, IfcDerivedMeasureValue); END_TYPE

D.11.2 度量资源实体的 EXPRESS 描述应按表 D.11.2 的规定采用。

表 D.11.2 度量资源实体的 EXPRESS 描述

实体	EXPRESS 描述
环境相关单位 (IfcContextDependentUnit)	ENTITY IfcContextDependentUnit SUBTYPE OF IfcNamedUnit; Name : IfcLabel; INVERSE HasExternalReference : SET OF IfcExternalReferenceRelationship FOR RelatedResourceObjects; END_ENTITY
基本转换单位 (IfcConversionBasedUnit)	ENTITY IfcConversionBasedUnit SUPERTYPE OF (IfcConversionBasedUnitWithOffset) SUBTYPE OF IfcNamedUnit; Name : IfcLabel; ConversionFactor : IfcMeasureWithUnit; INVERSE HasExternalReference : SET OF IfcExternalReferenceRelationship FOR RelatedResourceObjects; END_ENTITY
基本偏移转换单位 (IfcConversionBasedUnitWithOffset)	ENTITY IfcConversionBasedUnitWithOffset SUBTYPE OF IfcConversionBasedUnit; ConversionOffset : IfcReal; END_ENTITY

续表 D. 11. 2

实体	EXPRESS 描述
导出单位 (IfcDerivedUnit)	ENTITY IfcDerivedUnit; Elements : SET [1:?] OF IfcDerivedUnitElement; UnitType : IfcDerivedUnitEnum; UserDefinedType : OPTIONAL IfcLabel; DERIVE Dimensions : IfcDimensionalExponents := IfcDeriveDimensionalExponents(Elements); WHERE WR1 : (SIZEOF (Elements) > 1) OR ((SIZEOF (Elements) = 1) AND (Elements[1].Exponent <> 1)); WR2 : (UnitType <> IfcDerivedUnitEnum.USERDEFINED) OR ((UnitType = IfcDerivedUnitEnum.USERDEFINED) AND (EXISTS(SELF.UserDefinedType))); END_ENTITY
导出单位元素 (IfcDerivedUnitElement)	ENTITY IfcDerivedUnitElement; Unit : IfcNamedUnit; Exponent : INTEGER; END_ENTITY
量纲指数 (IfcDimensionalExponents)	ENTITY IfcDimensionalExponents; LengthExponent : INTEGER; MassExponent : INTEGER; TimeExponent : INTEGER; ElectricCurrentExponent : INTEGER; ThermodynamicTemperatureExponent : INTEGER; AmountOfSubstanceExponent : INTEGER; LuminousIntensityExponent : INTEGER; END_ENTITY
带单位度量 (IfcMeasureWithUnit)	ENTITY IfcMeasureWithUnit; ValueComponent : IfcValue; UnitComponent : IfcUnit; END_ENTITY
货币单位 (IfcMonetaryUnit)	ENTITY IfcMonetaryUnit; Currency : IfcLabel; END_ENTITY
命名单位 (IfcNamedUnit)	ENTITY IfcNamedUnit ABSTRACT SUPERTYPE OF (ONEOF(IfcContextDependentUnit, IfcConversionBasedUnit, IfcSIUnit)); Dimensions : IfcDimensionalExponents; UnitType : IfcUnitEnum; WHERE WR1 : IfcCorrectDimensions (SELF.UnitType, SELF.Dimensions); END_ENTITY
国际单位制单位 (IfcSIUnit)	ENTITY IfcSIUnit SUBTYPE OF IfcNamedUnit; Prefix : OPTIONAL IfcSIPrefix; Name : IfcSIUnitName; DERIVE SELF\IfcNamedUnit.Dimensions : IfcDimensionalExponents := IfcDimensionsForSiUnit (SELF.Name); END_ENTITY
指定单位 (IfcSIUnitAssignment)	ENTITY IfcUnitAssignment; Units : SET [1:?] OF IfcUnit; WHERE WR01 : IfcCorrectUnitAssignment(Units); END_ENTITY

D. 11. 3 度量资源函数的 EXPRESS 描述应按表 D. 11. 3 的规定采用。

表 D. 11.3 度量资源函数的 EXPRESS 描述

函数	EXPRESS 描述
<p>正确量纲 (IfcCorrect Dimensions)</p>	<pre> FUNCTION IfcCorrectDimensions (m : IfcUnitEnum; Dim : IfcDimensionalExponents) : LOGICAL; CASE m OF LENGTHUNIT : IF Dim = (IfcDimensionalExponents (1, 0, 0, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; MASSUNIT : IF Dim = (IfcDimensionalExponents (0, 1, 0, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; TIMEUNIT : IF Dim = (IfcDimensionalExponents (0, 0, 1, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; ELECTRICCURRENTUNIT : IF Dim = (IfcDimensionalExponents (0, 0, 0, 1, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; THERMODYNAMICTEMPERATUREUNIT : IF Dim = (IfcDimensionalExponents (0, 0, 0, 0, 1, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; AMOUNTOFSUBSTANCEUNIT : IF Dim = (IfcDimensionalExponents (0, 0, 0, 0, 0, 1, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; LUMINOUSINTENSITYUNIT : IF Dim = (IfcDimensionalExponents (0, 0, 0, 0, 0, 0, 1)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; PLANEANGLEUNIT : IF Dim = (IfcDimensionalExponents (0, 0, 0, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; SOLIDANGLEUNIT : IF Dim = (IfcDimensionalExponents (0, 0, 0, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; AREAUNIT : IF Dim = (IfcDimensionalExponents (2, 0, 0, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; VOLUMEUNIT : IF Dim = (IfcDimensionalExponents (3, 0, 0, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; ABSORBEDDOSEUNIT : IF Dim = (IfcDimensionalExponents (2, 0, -2, 0, 0, 0, 0)) </pre>

续表 D. 11. 3

函数	EXPRESS 描述
<p>正确量纲 (IfCorrect Dimensions)</p>	<pre> THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; RADIOACTIVITYUNIT : IF Dim = (IfcDimensionalExponents (0, 0, -1, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; ELECTRICCAPACITANCEUNIT : IF Dim = (IfcDimensionalExponents (-2, -1, 4, 2, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; DOSEEQUIVALENTUNIT : IF Dim = (IfcDimensionalExponents (2, 0, -2, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; ELECTRICCHARGEUNIT : IF Dim = (IfcDimensionalExponents (0, 0, 1, 1, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; ELECTRICCONDUCTANCEUNIT : IF Dim = (IfcDimensionalExponents (-2, -1, 3, 2, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; ELECTRICVOLTAGEUNIT : IF Dim = (IfcDimensionalExponents (2, 1, -3, -1, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; ELECTRICRESISTANCEUNIT : IF Dim = (IfcDimensionalExponents (2, 1, -3, -2, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; ENERGYUNIT : IF Dim = (IfcDimensionalExponents (2, 1, -2, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; FORCEUNIT : IF Dim = (IfcDimensionalExponents (1, 1, -2, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; FREQUENCYUNIT : IF Dim = (IfcDimensionalExponents (0, 0, -1, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; INDUCTANCEUNIT : IF Dim = (IfcDimensionalExponents (2, 1, -2, -2, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; ILLUMINANCEUNIT : IF Dim = (IfcDimensionalExponents (-2, 0, 0, 0, 0, 0, 1)) THEN RETURN(TRUE); </pre>

续表 D.11.3

函数	EXPRESS 描述
<p>正确量纲 (IfcCorrect Dimensions)</p>	<pre> ELSE RETURN(FALSE); END_IF; LUMINOUSFLUXUNIT : IF Dim = (IfcDimensionalExponents (0, 0, 0, 0, 0, 0, 1)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; MAGNETICFLUXUNIT : IF Dim = (IfcDimensionalExponents (2, 1, -2, -1, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; MAGNETICFLUXDENSITYUNIT : IF Dim = (IfcDimensionalExponents (0, 1, -2, -1, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; POWERUNIT : IF Dim = (IfcDimensionalExponents (2, 1, -3, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; PRESSUREUNIT : IF Dim = (IfcDimensionalExponents (-1, 1, -2, 0, 0, 0, 0)) THEN RETURN(TRUE); ELSE RETURN(FALSE); END_IF; OTHERWISE ; RETURN (UNKNOWN); END_CASE; END_FUNCTION </pre>
<p>正确指定单位 (IfcCorrectUnit Assignment)</p>	<pre> FUNCTION IfcCorrectUnitAssignment (Units : SET [1;?] OF IfcUnit) : LOGICAL; LOCAL NamedUnitNumber : INTEGER := 0; DerivedUnitNumber : INTEGER := 0; MonetaryUnitNumber : INTEGER := 0; NamedUnitNames : SET OF IfcUnitEnum := []; DerivedUnitNames : SET OF IfcDerivedUnitEnum := []; END_LOCAL; NamedUnitNumber := SIZEOF(QUERY(temp < * Units ('IFCMEASURERESOURCE. IFCNAMEDUNIT' IN TYPEOF(temp)) AND NOT(temp\IfcNamedUnit. UnitType = IfcUnitEnum. USERDEFINED))); DerivedUnitNumber := SIZEOF(QUERY(temp < * Units ('IFCMEASURERESOURCE. IFCDERIVEDUNIT' IN TYPEOF(temp)) AND NOT(temp\IfcDerivedUnit. UnitType = IfcDerivedUnit Enum. USERDEFINED))); MonetaryUnitNumber := SIZEOF(QUERY(temp < * Units 'IFCMEASURERESOURCE. IFCMONETARYUNIT' IN TYPEOF(temp))); REPEAT i : = 1 TO SIZEOF(Units); IF (('IFCMEASURERESOURCE. IFCNAMEDUNIT' IN TYPEOF(Units[i])) AND NOT(Units[i]\Ifc NamedUnit. UnitType = IfcUnitEnum. USERDEFINED)) THEN </pre>

续表 D. 11. 3

函数	EXPRESS 描述
<p>正确指定单位 (IfcCorrectUnit Assignment)</p>	<pre> NamedUnitNames := NamedUnitNames + Units[i]\IfcNamedUnit. UnitType; END_IF; IF (('IFCMEASURERESOURCE. IFCDERIVEDUNIT' IN TYPEOF(Units[i])) AND NOT(Units[i]\ IfcDerivedUnit. UnitType = IfcDerivedUnitEnum. USERDEFINED)) THEN DerivedUnitNames := DerivedUnitNames + Units[i]\IfcDerivedUnit. UnitType; END_IF; END_REPEAT; RETURN((SIZEOF(NamedUnitNames) = NamedUnitNumber) AND (SIZEOF(DerivedUnitNames) = DerivedUnitNumber) AND (MonetaryUnitNumber <= 1)); END_FUNCTION </pre>
<p>导出量纲指数 (IfcDeriveDimensional Exponents)</p>	<pre> FUNCTION IfcDeriveDimensionalExponents (UnitElements : SET [1:?] Of IfcDerivedUnitElement) : IfcDimensionalExponents; LOCAL Result : IfcDimensionalExponents := IfcDimensionalExponents(0, 0, 0, 0, 0, 0, 0); END_LOCAL; REPEAT i := LOINDEX(UnitElements) TO HIINDEX(UnitElements); Result.LengthExponent := Result.LengthExponent + (UnitElements[i]. Exponent * UnitElements[i]. Unit. Dimensions.LengthExponent); Result.MassExponent := Result.MassExponent + (UnitElements[i]. Exponent * UnitElements[i]. Unit. Dimensions.MassExponent); Result.TimeExponent := Result.TimeExponent + (UnitElements[i]. Exponent * UnitElements[i]. Unit. Dimensions.TimeExponent); Result.ElectricCurrentExponent := Result.ElectricCurrentExponent + (UnitElements[i]. Exponent * UnitElements[i]. Unit. Dimensions.ElectricCurrentExponent); Result.ThermodynamicTemperatureExponent := Result.ThermodynamicTemperatureExponent + (UnitElements[i]. Exponent * UnitElements[i]. Unit. Dimensions.ThermodynamicTemperatureExponent); Result.AmountOfSubstanceExponent := Result.AmountOfSubstanceExponent + (UnitElements[i]. Exponent * UnitElements[i]. Unit. Dimensions.AmountOfSubstanceExponent); Result.LuminousIntensityExponent := Result.LuminousIntensityExponent + (UnitElements[i]. Exponent * UnitElements[i]. Unit. Dimensions.LuminousIntensityExponent); END_REPEAT; RETURN (Result); END_FUNCTION </pre>
<p>国际标准单位 量纲 (IfcDimensions ForSiUnit)</p>	<pre> FUNCTION IfcDimensionsForSiUnit (n : IfcSiUnitName) : IfcDimensionalExponents; CASE n OF METRE : RETURN (IfcDimensionalExponents (1, 0, 0, 0, 0, 0, 0)); SQUARE_METRE : RETURN (IfcDimensionalExponents (2, 0, 0, 0, 0, 0, 0)); CUBIC_METRE : RETURN (IfcDimensionalExponents (3, 0, 0, 0, 0, 0, 0)); GRAM : RETURN (IfcDimensionalExponents (0, 1, 0, 0, 0, 0, 0)); SECOND : RETURN (IfcDimensionalExponents (0, 0, 1, 0, 0, 0, 0)); AMPERE : RETURN (IfcDimensionalExponents </pre>

续表 D.11.3

函数	EXPRESS 描述
国际标准单位 量纲 (IfcDimensions ForSiUnit)	: RETURN (IfcDimensionalExponents (0, 0, 0, 1, 0, 0, 0));
	KELVIN : RETURN (IfcDimensionalExponents (0, 0, 0, 0, 1, 0, 0));
	MOLE : RETURN (IfcDimensionalExponents (0, 0, 0, 0, 0, 1, 0));
	CANDELA : RETURN (IfcDimensionalExponents (0, 0, 0, 0, 0, 0, 1));
	RADIAN : RETURN (IfcDimensionalExponents (0, 0, 0, 0, 0, 0, 0));
	STERADIAN : RETURN (IfcDimensionalExponents (0, 0, 0, 0, 0, 0, 0));
	HERTZ : RETURN (IfcDimensionalExponents (0, 0, -1, 0, 0, 0, 0));
	NEWTON : RETURN (IfcDimensionalExponents (1, 1, -2, 0, 0, 0, 0));
	PASCAL : RETURN (IfcDimensionalExponents (-1, 1, -2, 0, 0, 0, 0));
	JOULE : RETURN (IfcDimensionalExponents (2, 1, -2, 0, 0, 0, 0));
	WATT : RETURN (IfcDimensionalExponents (2, 1, -3, 0, 0, 0, 0));
	COULOMB : RETURN (IfcDimensionalExponents (0, 0, 1, 1, 0, 0, 0));
	VOLT : RETURN (IfcDimensionalExponents (2, 1, -3, -1, 0, 0, 0));
	FARAD : RETURN (IfcDimensionalExponents (-2, -1, 4, 2, 0, 0, 0));
	OHM : RETURN (IfcDimensionalExponents (2, 1, -3, -2, 0, 0, 0));
	SIEMENS : RETURN (IfcDimensionalExponents (-2, -1, 3, 2, 0, 0, 0));
	WEBER : RETURN (IfcDimensionalExponents (2, 1, -2, -1, 0, 0, 0));
	TESLA : RETURN (IfcDimensionalExponents (0, 1, -2, -1, 0, 0, 0));
	HENRY : RETURN (IfcDimensionalExponents (2, 1, -2, -2, 0, 0, 0));
	DEGREE_CELSIUS : RETURN (IfcDimensionalExponents (0, 0, 0, 0, 1, 0, 0));
	LUMEN : RETURN (IfcDimensionalExponents (0, 0, 0, 0, 0, 0, 1));
	LUX : RETURN (IfcDimensionalExponents (-2, 0, 0, 0, 0, 0, 1));
	BECQUEREL : RETURN (IfcDimensionalExponents (0, 0, -1, 0, 0, 0, 0));
	GRAY : RETURN (IfcDimensionalExponents (2, 0, -2, 0, 0, 0, 0));
	SIEVERT : RETURN (IfcDimensionalExponents (2, 0, -2, 0, 0, 0, 0));
	OTHERWISE : RETURN (IfcDimensionalExponents (0, 0, 0, 0, 0, 0, 0));
	END_CASE;
	END_FUNCTION

D.12 展示外观资源

D.12.1 展示外观资源类型的 EXPRESS 描述应按表 D.12.1 的规定采用。

表 D.12.1 展示外观资源类型的 EXPRESS 描述

类型	EXPRESS 描述
字体样式 (IfcFontStyle)	TYPE IfcFontStyle = STRING; WHERE WR1 : SELF IN ['normal','italic','oblique'] END_TYPE
字体转化 (IfcFontVariant)	TYPE IfcFontVariant = STRING; WHERE WR1 : SELF IN ['normal','small-caps'] END_TYPE
字体粗细 (IfcFontWeight)	TYPE IfcFontWeight = STRING; WHERE WR1 : SELF IN ['normal','small-caps','100','200','300','400','500','600','700','800','900'] END_TYPE
可表示文本 (IfcPresentableText)	TYPE IfcPresentableText = STRING; END_TYPE
反射指数 (IfcSpecularExponent)	TYPE IfcSpecularExponent = REAL; END_TYPE
反射粗糙度 (IfcSpecular Roughness)	TYPE IfcSpecularRoughness = REAL; WHERE WR1 : {0.0 <= SELF <= 1.0} END_TYPE
文本对齐 (IfcTextAlignment)	TYPE IfcTextAlignment = STRING; WHERE WR1 : SELF IN ['left','right','center','justify'] END_TYPE
文本修饰 (IfcTextDecoration)	TYPE IfcTextDecoration = STRING; WHERE WR1 : SELF IN ['none','underline','overline','line-through','blink'] END_TYPE
文本字体名称 (IfcTextFontName)	TYPE IfcTextFontName = STRING; END_TYPE
文本转换 (IfcText Transformation)	TYPE IfcTextTransformation = STRING; WHERE WR1 : SELF IN ['capitalize','uppercase','lowercase','none'] END_TYPE
空样式 (IfcNullStyle)	TYPE IfcNullStyle = ENUMERATION OF (NULL); END_TYPE
反射模型枚举 (IfcReflectance MethodEnum)	TYPE IfcReflectanceMethodEnum = ENUMERATION OF (BLINN, FLAT, GLASS, MATT, METAL, MIRROR, PHONG, PLASTIC, STRAUSS, NOTDEFINED); END_TYPE

续表 D.12.1

类型	EXPRESS 描述
侧表面 (IfcSurfaceSide)	TYPE IfcSurfaceSide = ENUMERATION OF (POSITIVE, NEGATIVE, BOTH); END_TYPE
颜色选择 (IfcColour)	TYPE IfcColour = SELECT (IfcColourSpecification, IfcPreDefinedColour); END_TYPE
颜色或因子选择 (IfcColourOrFactor)	TYPE IfcColourOrFactor = SELECT (IfcNormalisedRatioMeasure, IfcColourRgb); END_TYPE
曲线字体或比例化 曲线字体选择 (IfcCurveFont OrScaledCurve FontSelect)	TYPE IfcCurveFontOrScaledCurveFontSelect = SELECT (IfcCurveStyleFontSelect, IfcCurveStyleFontAndScaling); END_TYPE
曲线样式字体选择 (IfcCurveStyle FontSelect)	TYPE IfcCurveStyleFontSelect = SELECT (IfcPreDefinedCurveFont, IfcCurveStyleFont); END_TYPE
填充样式选择 (IfcFillStyleSelect)	TYPE IfcFillStyleSelect = SELECT (IfcFillAreaStyleHatching, IfcFillAreaStyleTiles, IfcExternallyDefinedHatchStyle, IfcColour); END_TYPE
影线距离选择 (IfcHatchLine DistanceSelect)	TYPE IfcHatchLineDistanceSelect = SELECT (IfcPositiveLengthMeasure, IfcVector); END_TYPE
表达样式选择 (IfcPresentation StyleSelect)	TYPE IfcPresentationStyleSelect = SELECT (IfcNullStyle, IfcCurveStyle, IfcFillAreaStyle, IfcTextStyle, IfcSurfaceStyle); END_TYPE
尺寸选择 (IfcSizeSelect)	TYPE IfcSizeSelect = SELECT (IfcRatioMeasure, IfcLengthMeasure, IfcDescriptiveMeasure, IfcPositiveLengthMeasure, IfcNormalisedRatioMeasure, IfcPositiveRatioMeasure); END_TYPE
反射高光选择 (IfcSpecular HighlightSelect)	TYPE IfcSpecularHighlightSelect = SELECT (IfcSpecularExponent, IfcSpecularRoughness); END_TYPE
样式分配选择 (IfcStyleAssignment Select)	TYPE IfcStyleAssignmentSelect = SELECT (IfcPresentationStyleAssignment, IfcPresentationStyle); END_TYPE

续表 D. 12. 1

类型	EXPRESS 描述
表面样式元素选择 (IfcSurfaceStyleElementSelect)	TYPE IfcSurfaceStyleElementSelect = SELECT (IfcSurfaceStyleShading, IfcSurfaceStyleLighting, IfcSurfaceStyleWithTextures, IfcExternallyDefinedSurfaceStyle, IfcSurfaceStyleRefraction); END_TYPE
文本字体选择 (IfcTextFontSelect)	TYPE IfcTextFontSelect = SELECT (IfcPreDefinedTextFont, IfcExternallyDefinedTextFont); END_TYPE

D. 12. 2 展示外观资源实体的 EXPRESS 描述应按表 D. 12. 2 的规定采用。

表 D. 12. 2 展示外观资源实体的 EXPRESS 描述

实体	EXPRESS 描述
二进制大对象纹理 (IfcBlobTexture)	ENTITY IfcBlobTexture SUBTYPE OF IfcSurfaceTexture; RasterFormat : IfcIdentifier; RasterCode : BINARY; WHERE SupportedRasterFormat : SELF.RasterFormat IN ['BMP', 'JPG', 'GIF', 'PNG']; RasterCodeByteStream : BLENGTH(RasterCode) MOD 8 = 0; END_ENTITY
红绿蓝颜色 (IfcColourRgb)	ENTITY IfcColourRgb SUBTYPE OF IfcColourSpecification; Red : IfcNormalisedRatioMeasure; Green : IfcNormalisedRatioMeasure; Blue : IfcNormalisedRatioMeasure; END_ENTITY
红绿蓝颜色列表 (IfcColourRgbList)	ENTITY IfcColourRgbList SUBTYPE OF IfcPresentationItem; ColourList : LIST [1:?] OF LIST [3:3] OF IfcNormalisedRatioMeasure; END_ENTITY
颜色分量 (IfcColourSpecification)	ENTITY IfcColourSpecification ABSTRACT SUPERTYPE OF (IfcColourRgb) SUBTYPE OF IfcPresentationItem; Name : OPTIONAL IfcLabel; END_ENTITY
曲线样式 (IfcCurveStyle)	ENTITY IfcCurveStyle SUBTYPE OF IfcPresentationStyle; CurveFont : OPTIONAL IfcCurveFontOrScaledCurveFontSelect; CurveWidth : OPTIONAL IfcSizeSelect; CurveColour : OPTIONAL IfcColour; ModelOrDraughting : OPTIONAL BOOLEAN; WHERE MeasureOfWidth : (NOT(EXISTS(CurveWidth))) OR ('IFCMEASURERESOURCE. IFCPOSITIVELENGTHMEASURE' IN TYPEOF(CurveWidth)) OR (('IFCMEASURERESOURCE. IFCDESCRIPTIVEMEASURE' IN TYPEOF(CurveWidth)) AND (CurveWidth = 'by layer')); IdentifiableCurveStyle : EXISTS(CurveFont) OR EXISTS(CurveWidth) OR EXISTS(CurveColour); END_ENTITY
曲线样式字体 (IfcCurveStyleFont)	ENTITY IfcCurveStyleFont SUBTYPE OF IfcPresentationItem; Name : OPTIONAL IfcLabel; PatternList : LIST [1:?] OF IfcCurveStyleFontPattern; END_ENTITY

续表 D.12.2

实体	EXPRESS 描述
曲线样式字体比例 (IfcCurveStyleFontAndScaling)	ENTITY IfcCurveStyleFontAndScaling SUBTYPE OF IfcPresentationItem; Name : OPTIONAL IfcLabel; CurveFont : IfcCurveStyleFontSelect; CurveFontScaling : IfcPositiveRatioMeasure; END_ENTITY
曲线样式字体模板 (IfcCurveStyleFontPattern)	ENTITY IfcCurveStyleFontPattern SUBTYPE OF IfcPresentationItem; VisibleSegmentLength : IfcLengthMeasure; InvisibleSegmentLength : IfcPositiveLengthMeasure; WHERE VisibleLengthGreaterEqualZero : VisibleSegmentLength >= 0. ; END_ENTITY
制图预定义颜色 (IfcDraftingPreDefinedColour)	ENTITY IfcDraftingPreDefinedColour SUBTYPE OF IfcPreDefinedColour; WHERE PreDefinedColourNames : SELF\IfcPreDefinedItem. Name IN ['black','red','green','blue','yellow','magenta','cyan','white','by layer']; END_ENTITY
制图预定义曲线字体 (IfcDraftingPreDefinedCurveFont)	ENTITY IfcDraftingPreDefinedCurveFont SUBTYPE OF IfcPreDefinedCurveFont; WHERE PreDefinedCurveFontNames : SELF\IfcPredefinedItem. Name IN ['continuous','chain','chain double dash','dash','dotted','by layer']; END_ENTITY
外部定义填充样式 (IfcExternallyDefinedHatchStyle)	ENTITY IfcExternallyDefinedHatchStyle SUBTYPE OF IfcExternalReference; END_ENTITY
外部定义表面样式 (IfcExternallyDefinedSurfaceStyle)	ENTITY IfcExternallyDefinedSurfaceStyle SUBTYPE OF IfcExternalReference; END_ENTITY
外部定义文本字体 (IfcExternallyDefinedTextFont)	ENTITY IfcExternallyDefinedTextFont SUBTYPE OF IfcExternalReference; END_ENTITY
填充区域样式 (IfcFillAreaStyle)	ENTITY IfcFillAreaStyle SUBTYPE OF IfcPresentationStyle; FillStyles : SET [1:?] OF IfcFillStyleSelect; ModelorDrafting : OPTIONAL BOOLEAN; WHERE MaxOneColour : SIZEOF(QUERY(Style < * SELF. FillStyles 'IFCPRESENTATIONAPPEARANCERE SOURCE. IFCCOLOUR' IN TYPEOF(Style))) <= 1; MaxOneExtHatchStyle : SIZEOF(QUERY(Style < * SELF. FillStyles 'IFCPRESENTATIONAPPEARANCERESOURCE. IFCEXTERNALLYDEFINEDHATCHSTYLE' IN TYPEOF(Style))) <= 1; ConsistentHatchStyleDef : IfcCorrectFillAreaStyle(SELF. FillStyles); END_ENTITY
填充区域样式阴影 (IfcFillAreaStyleHatching)	ENTITY IfcFillAreaStyleHatching SUBTYPE OF IfcGeometricRepresentationItem; HatchLineAppearance : IfcCurveStyle; StartOfNextHatchLine : IfcHatchLineDistanceSelect; PointOfReferenceHatchLine : OPTIONAL IfcCartesianPoint; PatternStart : OPTIONAL IfcCartesianPoint; HatchLineAngle : IfcPlaneAngleMeasure; WHERE PatternStart2D : NOT(EXISTS(PatternStart)) OR (PatternStart. Dim = 2) ; RefHatchLine2D : NOT(EXISTS(PointOfReferenceHatchLine)) OR (PointOfReferenceHatchLine. Dim = 2); END_ENTITY

续表 D. 12. 2

实体	EXPRESS 描述
填充区拼贴式样 (IfcFillAreaStyleTiles)	ENTITY IfcFillAreaStyleTiles SUBTYPE OF IfcGeometricRepresentationItem; TilingPattern ; LIST [2;2] OF IfcVector; Tiles ; SET [1;?] OF IfcStyledItem; TilingScale ; IfcPositiveRatioMeasure; END_ENTITY
图像纹理 (IfcImageTexture)	ENTITY IfcImageTexture SUBTYPE OF IfcSurfaceTexture; URLReference ; IfcURIReference; END_ENTITY
颜色映射索引 (IfcIndexedColourMap)	ENTITY IfcIndexedColourMap SUBTYPE OF IfcPresentationItem; MappedTo ; IfcTessellatedFaceSet; Overrides ; OPTIONAL IfcSurfaceStyleShading; Colours ; IfcColourRgbList; ColourIndex ; LIST [1;?] OF INTEGER; END_ENTITY
纹理映射索引 (IfcIndexedTextureMap)	ENTITY IfcIndexedTextureMap ABSTRACT SUPERTYPE OF (IfcIndexedTriangleTextureMap) SUBTYPE OF IfcTextureCoordinate; MappedTo ; IfcTessellatedFaceSet; TexCoords ; IfcTextureVertexList; END_ENTITY
三角纹理映射索引 (IfcIndexedTriangleTextureMap)	ENTITY IfcIndexedTriangleTextureMap SUBTYPE OF IfcIndexedTextureMap; TexCoordIndex ; OPTIONAL LIST [1;?] OF LIST [3;3] OF INTEGER; END_ENTITY
像素纹理 (IfcPixelTexture)	ENTITY IfcPixelTexture SUBTYPE OF IfcSurfaceTexture; Width ; IfcInteger; Height ; IfcInteger; ColourComponents ; IfcInteger; Pixel ; LIST [1;?] OF BINARY (32); WHERE MinPixelInS ; Width >= 1; MinPixelInT ; Height >= 1; NumberOfColours ; {1 <= ColourComponents <= 4}; SizeOfPixelList ; SIZEOF(Pixel) = (Width * Height); PixelAsByteAndSameLength ; SIZEOF(QUERY(temp <= Pixel (BLENGTH(temp) MOD 8 = 0) AND (BLENGTH(temp) = BLENGTH(Pixel[1]))) = SIZEOF(Pixel); END_ENTITY
预定义颜色 (IfcPreDefinedColour)	ENTITY IfcPreDefinedColour ABSTRACT SUPERTYPE OF (IfcDraftingPreDefinedColour) SUBTYPE OF IfcPreDefinedItem; END_ENTITY
预定义曲线字体 (IfcPreDefinedCurveFont)	ENTITY IfcPreDefinedCurveFont ABSTRACT SUPERTYPE OF (IfcDraftingPreDefinedCurveFont) SUBTYPE OF IfcPreDefinedItem; END_ENTITY
预定义项 (IfcPreDefinedItem)	ENTITY IfcPreDefinedItem ABSTRACT SUPERTYPE OF (ONEOF(IfcPreDefinedColour, IfcPreDefinedCurveFont, IfcPreDefinedTextFont)) SUBTYPE OF IfcPresentationItem; Name ; IfcLabel; END_ENTITY

续表 D.12.2

实体	EXPRESS 描述
预定义文本字体 (IfcPreDefinedTextFont)	ENTITY IfcPreDefinedTextFont ABSTRACT SUPERTYPE OF (IfcTextStyleFontModel) SUBTYPE OF IfcPreDefinedItem; END_ENTITY
表达样式 (IfcPresentationStyle)	ENTITY IfcPresentationStyle ABSTRACT SUPERTYPE OF (ONEOF (IfcCurveStyle, IfcFillAreaStyle, IfcSurfaceStyle, IfcTextStyle)); Name : OPTIONAL IfcLabel; END_ENTITY
表达样式分配 (IfcPresentationStyleAssignment)	ENTITY IfcPresentationStyleAssignment; Styles : SET [1..?] OF IfcPresentationStyleSelect; END_ENTITY
样式项 (IfcStyledItem)	ENTITY IfcStyledItem SUBTYPE OF IfcRepresentationItem; Item : OPTIONAL IfcRepresentationItem; Styles : SET [1..?] OF IfcStyleAssignmentSelect; Name : OPTIONAL IfcLabel; WHERE ApplicableItem : NOT ('IFCPRESENTATIONAPPEARANCERESOURCE.IFCSTYLEDITEM' IN TYPEOF (Item)); END_ENTITY
表面样式 (IfcSurfaceStyle)	ENTITY IfcSurfaceStyle SUBTYPE OF IfcPresentationStyle; Side : IfcSurfaceSide; Styles : SET [1..5] OF IfcSurfaceStyleElementSelect; WHERE MaxOneShading : SIZEOF (QUERY (Style < * SELF. Styles 'IFCPRESENTATIONAPPEARANCERESOURCE.IFCSURFACESTYLESHADING' IN TYPEOF (Style))) <= 1; MaxOneLighting : SIZEOF (QUERY (Style < * SELF. Styles 'IFCPRESENTATIONAPPEARANCERESOURCE.IFCSURFACESTYLELIGHTING' IN TYPEOF (Style))) <= 1; MaxOneRefraction : SIZEOF (QUERY (Style < * SELF. Styles 'IFCPRESENTATIONAPPEARANCERESOURCE.IFCSURFACESTYLEREFRACTION' IN TYPEOF (Style))) <= 1; MaxOneTextures : SIZEOF (QUERY (Style < * SELF. Styles 'IFCPRESENTATIONAPPEARANCERESOURCE.IFCSURFACESTYLEWITHTEXTURES' IN TYPEOF (Style))) <= 1; MaxOneExtDefined : SIZEOF (QUERY (Style < * SELF. Styles 'IFCPRESENTATIONAPPEARANCERESOURCE.IFCEXTERNALLYDEFINEDSURFACESTYLE' IN TYPEOF (Style))) <= 1; END_ENTITY
表面光照样式 (IfcSurfaceStyleLighting)	ENTITY IfcSurfaceStyleLighting SUBTYPE OF IfcPresentationItem; DiffuseTransmissionColour : IfcColourRgb; DiffuseReflectionColour : IfcColourRgb; TransmissionColour : IfcColourRgb; ReflectanceColour : IfcColourRgb; END_ENTITY
表面折射样式 (IfcSurfaceStyleRefraction)	ENTITY IfcSurfaceStyleRefraction SUBTYPE OF IfcPresentationItem; RefractionIndex : OPTIONAL IfcReal; DispersionFactor : OPTIONAL IfcReal; END_ENTITY
表面渲染样式 (IfcSurfaceStyleRendering)	ENTITY IfcSurfaceStyleRendering SUBTYPE OF IfcSurfaceStyleShading; Transparency : OPTIONAL IfcNormalisedRatioMeasure; DiffuseColour : OPTIONAL IfcColourOrFactor; TransmissionColour : OPTIONAL IfcColourOrFactor; DiffuseTransmissionColour : OPTIONAL IfcColourOrFactor; ReflectionColour : OPTIONAL IfcColourOrFactor; SpecularColour : OPTIONAL IfcColourOrFactor; SpecularHighlight : OPTIONAL IfcSpecularHighlightSelect; ReflectanceMethod : IfcReflectanceMethodEnum; END_ENTITY

续表 D. 12. 2

实体	EXPRESS 描述
表面明暗样式 (IfcSurfaceStyleShading)	ENTITY IfcSurfaceStyleShading SUPERTYPE OF(IfcSurfaceStyleRendering) SUBTYPE OF IfcPresentationItem; SurfaceColour : IfcColourRgb; END_ENTITY
表面纹理样式 (IfcSurfaceStyleWithTextures)	ENTITY IfcSurfaceStyleWithTextures SUBTYPE OF IfcPresentationItem; Textures : LIST [1:?] OF IfcSurfaceTexture; END_ENTITY
表面纹理 (IfcSurfaceTexture)	ENTITY IfcSurfaceTexture ABSTRACT SUPERTYPE OF(ONEOF(IfcBlobTexture, IfcImageTexture, IfcPixelTexture)) SUBTYPE OF IfcPresentationItem; RepeatS : BOOLEAN; RepeatT : BOOLEAN; Mode : OPTIONAL IfcIdentifier; TextureTransform : OPTIONAL IfcCartesianTransformationOperator2D; Parameter : OPTIONAL LIST [1:?] OF IfcIdentifier; INVERSE IsMappedBy : SET [0:?] OF IfcTextureCoordinate FOR Maps; UsedInStyles : SET [0:?] OF IfcSurfaceStyleWithTextures FOR Textures; END_ENTITY
文本样式 (IfcTextStyle)	ENTITY IfcTextStyle SUBTYPE OF IfcPresentationStyle; TextCharacterAppearance : OPTIONAL IfcTextStyleForDefinedFont; TextStyle : OPTIONAL IfcTextStyleTextModel; TextFontStyle : IfcTextFontSelect; ModelOrDraughting : OPTIONAL BOOLEAN; END_ENTITY
文本样式字体模型 (IfcTextStyleFontModel)	ENTITY IfcTextStyleFontModel SUBTYPE OF IfcPreDefinedTextFont; FontFamily : LIST [1:?] OF IfcTextFontName; FontStyle : OPTIONAL IfcFontStyle; FontVariant : OPTIONAL IfcFontVariant; FontWeight : OPTIONAL IfcFontWeight; FontSize : IfcSizeSelect; WHERE MeasureOfFontSize : ('IFCMEASURERESOURCE.IFCLengthMeasure' IN TYPEOF(SELF.FontSize)) AND (SELF.FontSize > 0.); END_ENTITY
定义字体文本样式 (IfcTextStyleForDefinedFont)	ENTITY IfcTextStyleForDefinedFont SUBTYPE OF IfcPresentationItem; Colour : IfcColour; BackgroundColour : OPTIONAL IfcColour; END_ENTITY
文本样式文本模型 (IfcTextStyleTextModel)	ENTITY IfcTextStyleTextModel SUBTYPE OF IfcPresentationItem; TextIndent : OPTIONAL IfcSizeSelect; TextAlign : OPTIONAL IfcTextAlignment; TextDecoration : OPTIONAL IfcTextDecoration; LetterSpacing : OPTIONAL IfcSizeSelect; WordSpacing : OPTIONAL IfcSizeSelect; TextTransform : OPTIONAL IfcTextTransformation; LineHeight : OPTIONAL IfcSizeSelect; END_ENTITY
纹理坐标 (IfcTextureCoordinate)	ENTITY IfcTextureCoordinate ABSTRACT SUPERTYPE OF(ONEOF(IfcIndexedTextureMap, IfcTextureCoordinateGenerator, IfcTextureMap)) SUBTYPE OF IfcPresentationItem; Maps : LIST [1:?] OF IfcSurfaceTexture; END_ENTITY

续表 D.12.2

实体	EXPRESS 描述
纹理坐标生成器 (IfcTextureCoordinateGenerator)	ENTITY IfcTextureCoordinateGenerator SUBTYPE OF IfcTextureCoordinate; Mode : IfcLabel; Parameter : OPTIONAL LIST [1:?] OF IfcReal; END_ENTITY
纹理映射 (IfcTextureMap)	ENTITY IfcTextureMap SUBTYPE OF IfcTextureCoordinate; Vertices : LIST [3:?] OF IfcTextureVertex; MappedTo : IfcFace; END_ENTITY
纹理顶点 (IfcTextureVertex)	ENTITY IfcTextureVertex SUBTYPE OF IfcPresentationItem; Coordinates : LIST [2:2] OF IfcParameterValue; END_ENTITY
纹理顶点列表 (IfcTextureVertexList)	ENTITY IfcTextureVertexList SUBTYPE OF IfcPresentationItem; TexCoordsList : LIST [1:?] OF LIST [2:2] OF IfcParameterValue; END_ENTITY

D.12.3 展示外观资源应采用正确填充样式 (IfcCorrectFillAreaStyle) 函数, 函数的 EXPRESS 描述应符合下列规定:

```

FUNCTION IfcCorrectFillAreaStyle
  (Styles : SET[1:?] OF IfcFillStyleSelect)
  :LOGICAL;
LOCAL
  Hatching : INTEGER := 0;
  Tiles : INTEGER := 0;
  Colour : INTEGER := 0;
  External : INTEGER := 0;
END_LOCAL;
External := SIZEOF(QUERY(Style < * Styles |
  'IFCPRESENTATIONAPPEARANCERESOURCE.IFCEXTERNALLYDEFINEDHATCH
  STYLE' IN
  TYPEOF(Style)));
Hatching := SIZEOF(QUERY(Style < * Styles |
  'IFCPRESENTATIONAPPEARANCERESOURCE.IFCFILLAREASTYLEHATCHING' IN
  TYPEOF(Style)));
Tiles := SIZEOF(QUERY(Style < * Styles |
  'IFCPRESENTATIONAPPEARANCERESOURCE.IFCFILLAREASTYLETILES' IN
  TYPEOF(Style)));
Colour := SIZEOF(QUERY(Style < * Styles |
  'IFCPRESENTATIONAPPEARANCERESOURCE.IFCCOLOUR' IN
  TYPEOF(Style)));
IF (External > 1) THEN
  RETURN (FALSE);
END_IF;
IF ((External = 1) AND ((Hatching > 0) OR (Tiles > 0) OR (Colour > 0))) THEN
  RETURN (FALSE);
END_IF;
IF (Colour > 1) THEN

```

```

RETURN (FALSE);
END_IF;
IF ((Hatching > 0) AND (Tiles >0)) THEN
    RETURN (FALSE);
END_IF;
RETURN(TRUE);
END_FUNCTION

```

D.13 展示定义资源

D.13.1 展示定义资源类型的 EXPRESS 描述应按表 D.13.1 的规定采用。

表 D.13.1 展示定义资源类型的 EXPRESS 描述

类型	EXPRESS 描述
框对齐 (IfcBoxAlignment)	<pre> TYPE IfcBoxAlignment = IfcLabel; WHERE WR1 : SELF IN ['top-left','top-middle','top-right','middle-left','center','middle-right','bottom-left','bottom-middle','bottom-right'] END_TYPE </pre>
文本路径枚举 (IfcTextPath)	<pre> TYPE IfcTextPath = ENUMERATION OF (LEFT, RIGHT, UP, DOWN); END_TYPE </pre>

D.13.2 展示定义资源实体的 EXPRESS 描述应按表 D.13.2 的规定采用。

表 D.13.2 展示定义资源实体的 EXPRESS 描述

实体	EXPRESS 描述
填充区域注释 (IfcAnnotationFillArea)	<pre> ENTITY IfcAnnotationFillArea SUBTYPE OF IfcGeometricRepresentationItem; OuterBoundary : IfcCurve; InnerBoundaries : OPTIONAL SET [1:?] OF IfcCurve; END_ENTITY </pre>
平面框 (IfcPlanarBox)	<pre> ENTITY IfcPlanarBox SUBTYPE OF IfcPlanarExtent; Placement : IfcAxis2Placement; END_ENTITY </pre>
平面范围 (IfcPlanarExtent)	<pre> ENTITY IfcPlanarExtent SUPERTYPE OF (IfcPlanarBox) SUBTYPE OF IfcGeometricRepresentationItem; SizeInX : IfcLengthMeasure; SizeInY : IfcLengthMeasure; END_ENTITY </pre>
表达项 (IfcPresentationItem)	<pre> ENTITY IfcPresentationItem ABSTRACT SUPERTYPE OF (ONEOF(IfcColourRgbList, IfcColourSpecification, IfcCurveStyleFont, IfcCurveStyleFontAndScaling, IfcCurveStyleFontPattern, IfcIndexedColourMap, IfcPreDefinedItem, IfcSurfaceStyleLighting, IfcSurfaceStyleRefraction, IfcSurfaceStyleShading, IfcSurfaceStyleWithTextures, IfcSurfaceTexture, IfcTextStyleForDefinedFont, IfcTextStyleTextModel, IfcTextureCoordinate, IfcTextureVertex, IfcTextureVertexList)); END_ENTITY </pre>

续表 D.13.2

实体	EXPRESS 描述
文本文字 (IfcTextLiteral)	ENTITY IfcTextLiteral SUPERTYPE OF (IfcTextLiteralWithExtent) SUBTYPE OF IfcGeometricRepresentationItem; Literal ; IfcPresentableText; Placement ; IfcAxis2Placement; Path ; IfcTextPath; END_ENTITY
带范围文本文字 (IfcTextLiteralWithExtent)	ENTITY IfcTextLiteralWithExtent SUBTYPE OF IfcTextLiteral; Extent ; IfcPlanarExtent; BoxAlignment ; IfcBoxAlignment; WHERE WR31 ; NOT('IFCPRESENTATIONDEFINITIONRESOURCE.IFCPLANARBOX' IN TYPEOF(Extent)); END_ENTITY

D.14 展示组织资源

D.14.1 展示组织资源类型的 EXPRESS 描述应按表 D.14.1 的规定采用。

表 D.14.1 展示组织资源类型的 EXPRESS 描述

类型	EXPRESS 描述
光分布曲线枚举 (IfcLightDistributionCurveEnum)	TYPE IfcLightDistributionCurveEnum = ENUMERATION OF (TYPE_A, TYPE_B, TYPE_C, NOTDEFINED); END_TYPE
发光源枚举 (IfcLightEmissionSourceEnum)	TYPE IfcLightEmissionSourceEnum = ENUMERATION OF (COMPACTFLUORESCENT, FLUORESCENT, HIGHPRESSUREMERCURY, HIGHPRESSURESODIUM, LIGHTEMITTINGDIODE, LOWPRESSURESODIUM, LOWVOLTAGEHALOGEN, MAINVOLTAGEHALOGEN, METALHALIDE, TUNGSTENFILAMENT, NOTDEFINED); END_TYPE
分层项选择 (IfcLayeredItem)	TYPE IfcLayeredItem = SELECT (IfcRepresentationItem, IfcRepresentation); END_TYPE
光分布数据资源选择 (IfcLightDistributionDataSourceSelect)	TYPE IfcLightDistributionDataSourceSelect = SELECT (IfcExternalReference, IfcLightIntensityDistribution); END_TYPE

D.14.2 展示组织资源实体的 EXPRESS 描述应按表 D.14.2 的规定采用。

表 D. 14. 2 展示组织资源实体的 EXPRESS 描述

实体	EXPRESS 描述
光分布数据 (IfcLightDistributionData)	ENTITY IfcLightDistributionData; MainPlaneAngle ; IfcPlaneAngleMeasure; SecondaryPlaneAngle ; LIST [1:?] OF IfcPlaneAngleMeasure; LuminousIntensity ; LIST [1:?] OF IfcLuminousIntensityDistributionMeasure; END_ENTITY
光强分布 (IfcLightIntensityDistribution)	ENTITY IfcLightIntensityDistribution; LightDistributionCurve ; IfcLightDistributionCurveEnum; DistributionData ; LIST [1:?] OF IfcLightDistributionData; END_ENTITY
光源 (IfcLightSource)	ENTITY IfcLightSource ABSTRACT SUPERTYPE OF(ONEOF(IfcLightSourceAmbient, IfcLightSourceDirectional, IfcLightSourceGoniometric, IfcLightSourcePositional)) SUBTYPE OF IfcGeometricRepresentationItem; Name ; OPTIONAL IfcLabel; LightColour ; IfcColourRgb; AmbientIntensity ; OPTIONAL IfcNormalisedRatioMeasure; Intensity ; OPTIONAL IfcNormalisedRatioMeasure; END_ENTITY
环境光源 (IfcLightSourceAmbient)	ENTITY IfcLightSourceAmbient SUBTYPE OF IfcLightSource; END_ENTITY
光源方向 (IfcLightSourceDirectional)	ENTITY IfcLightSourceDirectional SUBTYPE OF IfcLightSource; Orientation ; IfcDirection; END_ENTITY
光源几何 (IfcLightSourceGoniometric)	ENTITY IfcLightSourceGoniometric SUBTYPE OF IfcLightSource; Position ; IfcAxis2Placement3D; ColourAppearance ; OPTIONAL IfcColourRgb; ColourTemperature ; IfcThermodynamicTemperatureMeasure; LuminousFlux ; IfcLuminousFluxMeasure; LightEmissionSource ; IfcLightEmissionSourceEnum; LightDistributionDataSource ; IfcLightDistributionDataSourceSelect; END_ENTITY
光源位置 (IfcLightSourcePositional)	ENTITY IfcLightSourcePositional SUPERTYPE OF(IfcLightSourceSpot) SUBTYPE OF IfcLightSource; Position ; IfcCartesianPoint; Radius ; IfcPositiveLengthMeasure; ConstantAttenuation ; IfcReal; DistanceAttenuation ; IfcReal; QuadricAttenuation ; IfcReal; END_ENTITY
光源点 (IfcLightSourceSpot)	ENTITY IfcLightSourceSpot SUBTYPE OF IfcLightSourcePositional; Orientation ; IfcDirection; ConcentrationExponent ; OPTIONAL IfcReal; SpreadAngle ; IfcPositivePlaneAngleMeasure; BeamWidthAngle ; IfcPositivePlaneAngleMeasure; END_ENTITY