INTERNATIONAL STANDARD ISO 10303-47:1997
TECHNICAL CORRIGENDUM 1

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Industrial automation systems and integration — Product data representation and exchange —

Part 47:
Integrated generic resource: Shape variation tolerances

TECHNICAL CORRIGENDUM 1

Systèmes d'automatisation industrielle et intégration — Représentation et échange de données de produits — Partie 47: Ressources génériques intégrées: Tolérances de variation de forme

RECTIFICATIF TECHNIQUE 1

Technical Corrigendum 1 to International Standard ISO 10303-47:1997 was prepared by Technical Committee ISO/TC 184, *Industrial automation systems and integration*, Subcommittee SC 4, *Industrial data*.

Introduction

This document corrects ISO 10303-47:1997, Product data representation and exchange — Part 47: Integrated generic resource: Shape variation tolerances. The corrected document supersedes ISO 10303-47:1997.

The purpose of the modifications to the text of ISO 10303-47:1997 is to correct errors in the EXPRESS definitions likely to cause compilation problems, to replace a WR that was overly restrictive, to replace the annex for the computer-interpretable EXPRESS with a URL reference, and to replace the object identifier for the document and the applicable schema.

ICS 25.040.40 **Ref. No. ISO 10303-47:1997/Cor.1:2000(E)**

Modifications to the text of ISO 10303-47:1997

Clause 4.4.1, p. 9

The EXPRESS specification for datum does not have a group qualifier for WR1. Without the group qualifier, datum can be ambiguous in complex instances. Remove the EXPRESS specification and replace with the following:

EXPRESS specification:

```
*)
ENTITY datum
  SUBTYPE OF (shape_aspect);
  identification               :identifier;
INVERSE
  established_by_relationships : SET [1:?] OF shape_aspect_relationship
                                   FOR related_shape_aspect;
WHERE
  WR1: SIZEOF (QUERY (x<*SELF\datum.established_by_relationships |
       SIZEOF (TYPEOF(x\shape_aspect_relationship.relating_shape_aspect)*
       ['SHAPE_ASPECT_DEFINITION_SCHEMA.DATUM_FEATURE',
       'SHAPE_ASPECT_DEFINITION_SCHEMA.DATUM_TARGET']) <> 1))=0;
END_ENTITY;
(*
```

Clause 4.4.3, p. 12

The EXPRESS specification for datum_target does not have a group qualifier for WR1 or WR2. Without the group qualifier, datum_target can be ambiguous in complex instances. Remove the EXPRESS specification and replace with the following:

EXPRESS specification:

```
*)
ENTITY datum_target
  SUBTYPE OF (shape_aspect);
  target_id                 : identifier;
INVERSE
  target_basis_relationship : shape_aspect_relationship FOR
                              relating_shape_aspect;
WHERE
   WR1: SIZEOF (QUERY (sar<* bag_to_set (USEDIN (SELF,
      'PRODUCT_PROPERTY_DEFINITION_SCHEMA.SHAPE_ASPECT_RELATIONSHIP.' +
        'RELATING_SHAPE_ASPECT'))
      | NOT ('SHAPE_ASPECT_DEFINITION_SCHEMA.DATUM' IN TYPEOF
      (sar\shape_aspect_relationship.related_shape_aspect))))=0;
```

```
   WR2: SELF\shape_aspect.product_definitional = TRUE;
END_ENTITY;
(*
```

Clause 4.4.4, p. 13

The EXPRESS specification for datum_feature does not have a group qualifier for WR1 or WR2. Without the group qualifier, datum_feature can be ambiguous in complex instances. Remove the EXPRESS specification and replace with the following:

EXPRESS specification:

```
*)
ENTITY datum_feature
   SUBTYPE OF (shape_aspect);
INVERSE
   feature_basis_relationship : shape_aspect_relationship
                              FOR relating_shape_aspect;
WHERE
   WR1: SIZEOF (QUERY (sar<* bag_to_set (USEDIN (SELF,
        'PRODUCT_PROPERTY_DEFINITION_SCHEMA.SHAPE_ASPECT_RELATIONSHIP.' +
          'RELATING_SHAPE_ASPECT'))
        | NOT ('SHAPE_ASPECT_DEFINITION_SCHEMA.DATUM' IN TYPEOF
        (sar\shape_aspect_relationship.related_shape_aspect))))=0;
  WR2: SELF\shape_aspect.product_definitional = TRUE;
END_ENTITY;
(*
```

Clause 4.5.2, p. 15

The EXPRESS specification for derived_shape_aspect is incorrect. The INVERSE reference was invalid. The INVERSE was modified and WR1: was added to satisfy the intent of the original INVERSE definition. Remove the EXPRESS specification and replace with the following:

EXPRESS specification:

```
*)
ENTITY derived_shape_aspect
  SUPERTYPE OF (ONEOF (apex,
                       centre_of_symmetry,
                       geometric_alignment,
                       geometric_intersection,
                       parallel_offset,
                       perpendicular_to,
                       extension,
                       tangent))
```

```
  SUBTYPE OF (shape_aspect);
INVERSE
  deriving_relationships : SET [1:?] OF
          shape_aspect_relationship FOR relating_shape_aspect;
WHERE
   WR1: SIZEOF (QUERY (dr <*
          SELF\derived_shape_aspect.deriving_relationships |
          NOT ('SHAPE_ASPECT_DEFINITION_SCHEMA.' +
               'SHAPE_ASPECT_DERIVING_RELATIONSHIP'
          IN TYPEOF (dr)))) = 0;
END_ENTITY;
(*
```

Remove the Attribute definitions and replace with the following:

Attribute definitions:

deriving_relationships: the identification of **shape_aspect_relationship**s that define the **derived_shape_aspect**.

Add the following after the Attribute definitions:

Formal proposition:

WR1: The **deriving_relationships** shall be **shape_aspect_deriving_relationship**s.

Clause 4.5.4, p. 17
The EXPRESS specification for centre_of_symmetry does not have a group qualifier for WR1. Without the group qualifier, centre_of_symmetry can be ambiguous in complex instances. Remove the EXPRESS specification and replace with the following:

EXPRESS specification:

```
*)
ENTITY centre_of_symmetry
   SUBTYPE OF (derived_shape_aspect);
WHERE
   WR1: SIZEOF
        (QUERY(sadr<*SELF\derived_shape_aspect.deriving_relationships|
    NOT('SHAPE_ASPECT_DEFINITION_SCHEMA.SYMMETRIC_SHAPE_ASPECT'
     IN TYPEOF
     (sadr\shape_aspect_relationship.related_shape_aspect))))=0;
END_ENTITY;
(*
```

Clause 4.5.12, p. 26

The EXPRESS specification for symmetric_shape_aspect does not have a group qualifier for WR1. Without the group qualifier, symmetric_shape_aspect can be ambiguous in complex instances. Remove the EXPRESS specification and replace with the following:

EXPRESS specification:

```
*)
ENTITY symmetric_shape_aspect
  SUBTYPE OF (shape_aspect);
INVERSE
  basis_relationships : SET [1:?] OF shape_aspect_relationship
                        FOR relating_shape_aspect;
WHERE
  WR1: SIZEOF (QUERY (x<*SELF\symmetric_shape_aspect.basis_relationships |
       'SHAPE_ASPECT_DEFINITION_SCHEMA.CENTRE_OF_SYMMETRY' IN TYPEOF
       (x\shape_aspect_relationship.related_shape_aspect)))>=1;
END_ENTITY;
(*
```

Clause 5, p. 28

The EXPRESS specification and the NOTE for the shape_dimension_schema did not identify the necessary external references for a shape_dimension_representation formal proposition. Add to the EXPRESS specification:

```
REFERENCE FROM measure_schema
   (measure_with_unit);
REFERENCE FROM representation_schema
   (representation);
```

after:

```
SCHEMA shape_dimension_schema;
```

Add to the NOTE:

measure_schema	ISO 10303-41
representation_schema	ISO 10303-43

before:

qualified_measure_schema	ISO 10303-45

Clause 5.4.8, p. 38

The EXPRESS specification of the shape_dimension_representation does not have a group qualifier for WR1, WR2, or WR3. Without the group qualifier, the shape_dimension_representation WRs can be ambiguous in a complex instance.

WR2 was overly restrictive for utilization in development of application protocols. WR2 was changed from '2' to '3'. In the last paragraph of the definition of 5.4.8, delete the following:

A **shape_dimension_representation** may have many **representation_item**s, but two of the **representation_item**s shall define a specific **shape_dimension_representation**.

Replace with the following:

A **shape_representation** may have many **representation_item**s, but two of the **representation_item**s shall define a specific **shape_dimension_representation**.

Remove the EXPRESS specification and replace with the following:

EXPRESS specification:

```
*)
ENTITY shape_dimension_representation
                SUBTYPE OF (shape_representation);
  WHERE
   WR1: SIZEOF (QUERY (temp <* SELF\representation.items |
    NOT ('QUALIFIED_MEASURE_SCHEMA.MEASURE_REPRESENTATION_ITEM'
        IN TYPEOF (temp)))) = 0;
   WR2: SIZEOF (SELF\representation.items) <= 3;
   WR3: SIZEOF (QUERY (pos_mri <* QUERY (real_mri <*
        SELF\representation.items | 'REAL' IN TYPEOF
        (real_mri\measure_with_unit.value_component) ) |
     NOT  (pos_mri\measure_with_unit.value_component > 0.0 ))) = 0;
END_ENTITY;
(*
```

Clause 6, p. 40

The EXPRESS specification for the shape_tolerance_schema does not contain the necessary external references due to the changes identified in this Technical Corrigendum for the projected_zone_definition. Delete the following EXPRESS specification:

```
REFERENCE FROM measure_schema
   (measure_with_unit, measure_value);
```

Replace with the following EXPRESS specification:

```
REFERENCE FROM measure_schema
   (derive_dimensional_exponents,
    dimensional_exponents,
    measure_with_unit,
    measure_value);
```

Clause 6.3.2, p. 42
The name of the entity tolerance_select is identical to another entity in another integrated resource of ISO 10303. Therefore, the name of the tolerance_select was changed to shape_tolerance_select. Delete 6.3.2 and replace with the following:

6.3.2 shape_tolerance_select

A **shape_tolerance_select** type indicates that a tolerance can either be a **geometric_tolerance** or a **plus_minus_tolerance**.

EXPRESS specification:

```
*)
TYPE shape_tolerance_select = SELECT
     (geometric_tolerance,
      plus_minus_tolerance);
END_TYPE;
(*
```

Clause 6.4.2, p. 43
The EXPRESS specification of the geometric_tolerance was incomplete for WR1. Delete the current WR1 and replace WR1 with the following:

```
  WR1: ('NUMBER' IN TYPEOF
       (magnitude\measure_with_unit.value_component)) AND
       (magnitude\measure_with_unit.value_component >= 0.0);
```

Clause 6.4.5, p. 46
The EXPRESS specification of the geometric_tolerance_with_defined_unit was incomplete for WR1. Delete the current WR1 and replace WR1 with the following:

```
  WR1: ('NUMBER' IN TYPEOF
       (unit_size\measure_with_unit.value_component)) AND
       (unit_size\measure_with_unit.value_component > 0.0);
```

Clause 6.4.7, p. 47

The EXPRESS specification of the projected_zone_definition was incomplete for WR1 and did not contain a WR for the dimensional exponents requirement. Remove the EXPRESS specification and replace with the following:

EXPRESS specification:

```
*)
ENTITY projected_zone_definition
  SUBTYPE OF (tolerance_zone_definition);
  projection_end   : shape_aspect;
  projected_length : measure_with_unit;
WHERE
  WR1: ('NUMBER' IN TYPEOF
       (projected_length\measure_with_unit.value_component)) AND
       (projected_length\measure_with_unit.value_component > 0.0);
  WR2: (derive_dimensional_exponents
       (projected_length\measure_with_unit.unit_component)=
        dimensional_exponents(1,0,0,0,0,0,0));
END_ENTITY;
(*
```

Add the following to the Formal propositions after WR1:

WR2: The dimensional exponents of projected_length shall characterize a length unit.

Clause 6.4.12, p. 51

With the renaming of the entity tolerance_select to shape_tolerance_select, the entity tolerance_with_statistical_distribution has the attribute associated_tolerance that has to be changed. Delete the EXPRESS tolerance_with_statistical_distribution and replace with the following:

EXPRESS specification:

```
*)
ENTITY tolerance_with_statistical_distribution;
   associated_tolerance : shape_tolerance_select;
   tolerance_allocation : statistical_distribution_for_tolerance;
END_ENTITY;
(*
```

Clause 6.5.3, p. 55

The EXPRESS specification of the tolerance_value does not have a group qualifier for WR1 or WR2. Without the group qualifier, the tolerance_value WRs can be ambiguous in a complex instance. Remove the EXPRESS specification and replace with the following: