INTERNATIONAL STANDARD ISO 10303-46:1994
TECHNICAL CORRIGENDUM 2

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

Part 46: Integrated generic resources: Visual presentation

TECHNICAL CORRIGENDUM 2

Systèmes d'automatisation industrielle et intégration — Représentation et échange de données de produits — Partie 46: Ressources génériques intégrées: Présentation visuelle

RECTIFICATIF TECHNIQUE 2

Technical Corrigendum 2 to International Standard ISO 10303-46:1994 was prepared by Technical Committee ISO/TC 184, *Industrial automation systems and integration*, Subcommittee SC 4, *Industrial data*.

Introduction

This corrigendum applies to ISO 10303-46:1994 as corrected by ISO 10303-46:1994/Cor.1:1999. For the convenience of the user, this corrigendum also includes the content of corrigendum 1.

The purpose of the modifications to the text of ISO 10303-46:1994 is to correct errors in the EXPRESS, to clarify a definition, to correct errors in Informal propositions and Formal propositions, to correct errors identified in the ballot for ISO 10303-518, and to replace the object identifier for the document and the schemas.

ICS 25.040.40 **Ref. No. ISO 10303-46:1994/Cor.2:2002(E)**

Modifications to the text of ISO 10303-46:1994

Clause 2, p. 2
The Normative references require an additional normative reference for the correction identified in clause 7.3.21. Add the following to the list of Normative references:

ISO 3098-0:1977, *Technical product documentation — Lettering — Part 0: General requirements*

Clause 4, p. 5
The EXPRESS specification of ***camera_image_3d_with_scale*** *and* ***aspect_ratio,*** *defined below, requires additional EXPRESS external references. Remove the following:*

```
REFERENCE FROM presentation_resource_schema
   (colour,
    planar_box,
    presentation_scaled_placement);

REFERENCE FROM measure_schema
   (length_measure,
    positive_plane_angle_measure);
```

Replace with the following:

```
REFERENCE FROM presentation_resource_schema
   (colour,
    planar_box,
    planar_extent,
    presentation_scaled_placement);

REFERENCE FROM measure_schema
   (length_measure,
    positive_ratio_measure,
    positive_plane_angle_measure);
```

The EXPRESS specification for the **presentation_organization_schema** *did not include a reference to required data type. The first required data type is an entity data type, the* **annotation_occurrence** *for the Formal propositions in* **area_dependent_annotation_representation** *and* **view_dependent_annotation_representation**. *The second required data type is an entity data type, the symbol_representation for the Formal propositions in* **symbol_representation_rule**. *The third required data type is an entity data type, the* **symbol_representation_relationship** *for the Formal propositions in* **symbol_representation_rule**. *The fourth required data type is an entity data type, the* **styled_item** *for the Formal propositions in* **camera_model** *and* **light_source**. *The fifth required data type is an entity data type, the* **founded_item**. *It is required to be referenced since it is now a supertype of* **view_volume**. *Add the following to the EXPRESS specification between the 'SCHEMA presentation_organization_schema;' and the 'REFERENCE FROM presentation_resource_schema':*

```
REFERENCE FROM presentation_definition_schema
    (annotation_occurrence,
     symbol_representation,
     symbol_representation_relationship);

REFERENCE FROM presentation_appearance_schema
    (styled_item);
```

Delete the following EXPRESS specification:

```
REFERENCE FROM representation_schema
    (item_defined_transformation,
     item_in_context,
     mapped_item,
     representation,
     representation_item,
     representation_map,
     representation_relationship,
     representation_relationship_with_transformation);
```

Replace with the following EXPRESS specification:

```
REFERENCE FROM representation_schema
    (founded_item,
     item_defined_transformation,
     item_in_context,
     mapped_item,
     representation,
     representation_item,
     representation_map,
     representation_relationship,
     representation_relationship_with_transformation);
```

With the addition of the **annotation_occurrence**, **symbol_representation**, **symbol_representation_relationship** *and* **styled_item** *to the* **presentation_organization_schema**, *NOTE 1 changed. Delete NOTE 1 and replace with the following:*

NOTE 1 The schemas referenced above can be found in the following parts of ISO 10303:

Presentation_definition_schema	Clause 5 of this part of ISO 10303
Presentation_appearance_schema	Clause 6 of this part of ISO 10303
Presentation_resource_schema	Clause 7 of this part of ISO 10303
Geometry_schema	ISO 10303-42
Representation_schema	ISO 10303-43
Measure_schema	ISO 10303-41
Support_resource_schema	ISO 10303-41

Clause 4.3.45, p. 13

The Informal proposition of **layered_item** *contradicts to the intended use of* **presentation_layer_assignment**. *The type of* **representation_item***s assigned to a layer shall not be restricted. Remove Informal proposition IP1.*

Clause 4.5.5, p. 26

The EXPRESS specification of **view_volume** *is revised to make it a subtype of* **founded_item** *in order to provide a representation context for the* **projection_point** *and* **planar_box** *attributes. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
ENTITY view_volume
  SUBTYPE OF (founded_item);
  projection_type            : central_or_parallel;
  projection_point           : cartesian_point;
  view_plane_distance        : length_measure;
  front_plane_distance       : length_measure;
  front_plane_clipping       : BOOLEAN;
  back_plane_distance        : length_measure;
  back_plane_clipping        : BOOLEAN;
  view_volume_sides_clipping : BOOLEAN;
  view_window                : planar_box;
END_ENTITY;
(*
```

Add the following note at the end of the entity description:

NOTE Since **view_volume** is not a subtype of **geometric_representation_item** the instances of **cartesian_point** which is the **projection_point** attribute and **planar_box** which is the **view_window** attribute are not associated in the usual way with the **geometric_representation_context** of each **representation** using a **camera_model_d3** containing this **view_volume**. The **geometric_representation_context** is associated via the **founded_item** supertype.

Clause 4.5.9, p. 31

The EXPRESS specification of **light_source** *contained logical errors in the WHERE rule. WR1 requires a role name qualified by attribute name 'ITEM' for argument 2 of built-in function USEDIN. Delete the current WR1 and replace WR1 with the following:*

```
WR1: SIZEOF(USEDIN(SELF,'PRESENTATION_APPEARANCE_SCHEMA.'+
          'STYLED_ITEM.ITEM')) = 0;
```

Clause 4.5.14, p. 35

The description of the Formal propositions does not give a correct explanation of WR2. Remove the description of WR2 and replace with the following:

WR2: The target of the mapping shall be a **planar_box**.

Clause 4.5.16, p. 35
The EXPRESS specification for ***camera_image_3d_with_scale*** *defined below are required for reference from other parts of ISO 10303. Add the following as clause 4.5.16 after clause 4.5.15*

4.5.16 camera_image_3d_with_scale

A **camera_image_3d_with_scale** is a **camera_image** that projects three-dimensional geometry and has a derived scale. The scale is the ratio between the size of the viewport and the size of the **view_window** of the **view_volume**.

EXPRESS specification:

```
*)
ENTITY camera_image_3d_with_scale
  SUBTYPE OF (camera_image);
DERIVE
  scale: positive_ratio_measure := ((SELF\mapped_item.mapping_target\
         planar_extent.size_in_x) / (SELF\mapped_item.mapping_source.
         mapping_origin\camera_model_d3.perspective_of_volume.view_window.
         size_in_x));
WHERE
  WR1: ('PRESENTATION_ORGANIZATION_SCHEMA.CAMERA_MODEL_D3'
       IN TYPEOF (SELF\mapped_item.mapping_source.mapping_origin));
  WR2: aspect_ratio(SELF\mapped_item.mapping_target) =
       aspect_ratio(SELF\mapped_item.mapping_source.mapping_origin\
       camera_model_d3.perspective_of_volume.view_window);
  WR3: SELF\mapped_item.mapping_source.mapping_origin\camera_model_d3.
       perspective_of_volume.front_plane_clipping
       AND
       SELF\mapped_item.mapping_source.mapping_origin\camera_model_d3.
       perspective_of_volume.view_volume_sides_clipping;
  WR4: (SELF\mapped_item.mapping_target\planar_extent.size_in_x > 0)
       AND
       (SELF\mapped_item.mapping_target\planar_extent.size_in_y > 0);
  WR5: (SELF\mapped_item.mapping_source.mapping_origin\camera_model_d3.
       perspective_of_volume.view_window.size_in_x > 0)
       AND
       (SELF\mapped_item.mapping_source.mapping_origin\camera_model_d3.
       perspective_of_volume.view_window.size_in_y > 0);
  WR6: ('GEOMETRY_SCHEMA.' +
       'AXIS2_PLACEMENT_2D' IN TYPEOF (SELF\mapped_item.
       mapping_target\planar_box.placement))
       AND NOT ('GEOMETRY_SCHEMA.' +
       'AXIS2_PLACEMENT_3D' IN TYPEOF (SELF\mapped_item.
       mapping_target\planar_box.placement));
END_ENTITY;
(*
```

Attribute definitions:

scale: the **positive_ratio_measure** derived from the rectangular size of the viewport and the rectangular size of the **view_volume** of the **camera_model**.

Formal propositions:

WR1: The source of the projection shall be a **camera_model_d3**.

WR2: The aspect ratio of the viewport shall equal the aspect ratio of the **view_window** of the **view_volume**.

WR3: The geometry of the projected representation shall be clipped against the plane represented by the **front_plane_distance** and the planes which are the sides of the volume defined by the **view_volume**.

WR4: The rectangular size of the viewport shall be specified by positive values.

WR5: The rectangular size of the **view_window** shall be specified by positive values.

WR6: The drawing space of a **camera_image_3d_with_scale** shall be specified in a 2D coordinate system.

Informal propositions:

IP1: The horizontal and vertical components of the viewport shall be parallel to the corresponding components of the **view_window** of the **view_volume**.

Clause 4.9.1, p. 39
The EXPRESS specification for the FUNCTION **acyclic_presentation_representation_relationship** *contained logical errors in the function body. The assignment to variable 'x' requires a 'SET' and not a 'BAG'. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
FUNCTION acyclic_presentation_representation_relationship
  ( relation : presentation_representation_relationship;
    children : SET OF presentation_representation ) : BOOLEAN;

  LOCAL
    x : SET OF presentation_representation_relationship;
    local_children : SET OF presentation_representation;
  END_LOCAL;

  REPEAT i:=1 TO HIINDEX(children);
    IF relation\representation_relationship.rep_1 :=: children[i] THEN
       RETURN(FALSE);
    END_IF;
  END_REPEAT;

  x := bag_to_set (USEDIN ( relation\representation_relationship.rep_1,
                  'REPRESENTATION_SCHEMA.'+
                  'REPRESENTATION_RELATIONSHIP.REP_2'));
  local_children := children + relation\representation_relationship.rep_1;
```

```
  IF SIZEOF (x) > 0 THEN
    REPEAT i:=1 TO HIINDEX (x);
       IF NOT acyclic_presentation_representation_relationship
              (x[i] , local_children) THEN
         RETURN (FALSE);
       END_IF;
    END_REPEAT;
  END_IF;

  RETURN (TRUE);

END_FUNCTION;
(*
```

Clause 4.9.2, p.39
The EXPRESS specification for ***aspect_ratio*** *defined below are required for reference from other parts of ISO 10303. This entity was incorrectly defined in ISO 10303-517. Add the following as clause 4.9.2 after clause 4.9.1 and before the END_SCHEMA EXPRESS specification:*

4.9.2 aspect ratio

The **aspect_ratio** function checks that both the attributes, size_in_x and size_in_y, have positivie values and returns a **positive_ratio_measure** that is the ratio of length to height for a given **planar_box**. In other cases, an indeterminate value is returned.

EXPRESS specification:

```
*)
FUNCTION aspect_ratio (p : planar_box) : positive_ratio_measure;
(* if the dimensions of the planar_box are greater than zero,
      compute the aspect ratio and return the resulting value. *)
   IF (p.size_in_x > 0.) AND (p.size_in_y > 0.) THEN
      RETURN (p.size_in_x / p.size_in_y);
   ELSE
      RETURN (?);
   END_IF;
END_FUNCTION;
(*
```

Argument definitions:

p: The input **planar_box** to be checked.

Clause 5, p. 40
The EXPRESS specification for the **presentation_definition_schema** *did not include a reference to a required data type. The required reference is a function, the* **bag_to_set** *for the EXPRESS specifications changed in* **acyclic_presentation_representation_relationship**, **acyclic_symbol_representation_relationship** *and* **field_in_table**. *Delete the following EXPRESS specification:*

```
REFERENCE FROM support_resource_schema
    (label,
     text);
```

Replace with the following EXPRESS specification:

```
REFERENCE FROM support_resource_schema
    (label,
     text,
     bag_to_set);
```

Clause 5.4.13, p.53

*The EXPRESS specification for **table_record_representation** was incorrect. The local rules of table_record_representation are incorrect since the variable map_item is of type REPRESENTATION,, but it is used as argument to the function using_representations, which accepts only variables of type FOUNDED_ITEM_SELECT. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
ENTITY table_record_representation
  SUBTYPE OF (symbol_representation);
WHERE
  WR1: (SIZEOF(USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                             'REPRESENTATION_RELATIONSHIP.REP_2')) > 0)
                        OR
       (SIZEOF(QUERY( map_item <* USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                                               'REPRESENTATION_MAP.'+
                                               'MAPPED_REPRESENTATION') |
         SIZEOF(QUERY( mi <* USEDIN(map_item, 'REPRESENTATION_SCHEMA.'+
                                              'MAPPED_ITEM.'+
                                              'MAPPING_SOURCE') |
                                        'PRESENTATION_DEFINITION_SCHEMA.'+
                                              'TABLE_REPRESENTATION' IN
              TYPEOF (using_representations (mi)) )) > 0))
                     > 0);
END_ENTITY;
(*
```

Clause 5.4.14, p.54

*The EXPRESS specification for **table_record_field_representation** was incorrect. The local rules of table_record_field_representation are incorrect since the variable map_item is of type REPRESENTATION,, but it is used as argument to the function using_representations, which accepts only variables of type FOUNDED_ITEM_SELECT. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
ENTITY table_record_field_representation
  SUBTYPE OF (symbol_representation);
WHERE
  WR1: (SIZEOF(USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                             'REPRESENTATION_RELATIONSHIP.REP_2')) > 0)
                        OR
       (SIZEOF(QUERY( map_item <* USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                                               'REPRESENTATION_MAP.'+
                                               'MAPPED_REPRESENTATION') |
         SIZEOF(QUERY( mi <* USEDIN(map_item, 'REPRESENTATION_SCHEMA.'+
                                              'MAPPED_ITEM.'+
```

```
                                                    'MAPPING_SOURCE') |
                                                'PRESENTATION_DEFINITION_SCHEMA.'+
                                                  'TABLE_RECORD_REPRESENTATION' IN
                TYPEOF (using_representations (mi)) )) > 0))
                       > 0);
END_ENTITY;
(*
```

Clause 5.6.2, p. 72

The EXPRESS specification for the FUNCTION **acyclic_symbol_representation_relationship** *contained logical errors in the function body. The assignment to variable 'x' requires a 'SET' and not a 'BAG'. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
FUNCTION acyclic_symbol_representation_relationship
  (relation : symbol_representation_relationship;
   children : SET OF symbol_representation ) : BOOLEAN;
  LOCAL
    x : SET OF symbol_representation_relationship;
    local_children : SET OF symbol_representation;
  END_LOCAL;

  REPEAT i:=1 TO HIINDEX(children);
    IF relation\representation_relationship.rep_1 :=: children[i] THEN
      RETURN(FALSE);
    END_IF;
  END_REPEAT;

  x := bag_to_set (USEDIN ( relation\representation_relationship.rep_1,
                'REPRESENTATION_SCHEMA.'+
                'REPRESENTATION_RELATIONSHIP.'+ 'REP_2'));
  local_children := children + relation\representation_relationship.rep_1;

  IF SIZEOF (x) > 0 THEN
    REPEAT i:=1 TO HIINDEX (x);
      IF NOT acyclic_symbol_representation_relationship(x[i] ,
                                                local_children) THEN
        RETURN (FALSE);
      END_IF;
    END_REPEAT;
  END_IF;

  RETURN (TRUE);

END_FUNCTION;
(*
```

Clause 5.6.3, p. 73

The EXPRESS specification for the FUNCTION **field_in_table** *contained spelling and logical errors. The expression in the first QUERY requires a string 'PRESENTATION_DEFINITION_SCHEMA. TABLE_RECORD_REPRESENTATION' and not a string 'PRESENTATION_DEFINITIONS_ SCHEMA.TABLE_RECORD_REPRESENTATION'. The declaration of variable 'symbol_rep_rel_set' requires a 'SET" and not a 'SET[1:?]'. The declaration of variable mapped_item_set' requires a 'SET" and not a 'SET[1:?]'. The declaration of variable 'table_record_rep_set' requires a 'SET" and not a 'SET[1:?]'.The assignment to variable 'symbol_rep_rel_set' requires a 'SET" and not a 'BAG'. The built-in function USEDIN in the second QUERY requires a role name qualified by an attribute name as argument 2. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
FUNCTION field_in_table (field : table_record_field_representation;
                         table : annotation_table_occurrence): BOOLEAN;
  LOCAL
    table_rep : table_representation;
    symbol_rep_rel_set : SET OF symbol_representation_relationship;
    mapped_item_set : SET OF mapped_item;
    table_record_rep_set : SET OF table_record_representation := [];
  END_LOCAL;

  table_rep := table\styled_item.item\mapped_item.mapping_source.
    mapped_representation;
  mapped_item_set := QUERY(item <* table_rep.items |
                       ('REPRESENTATION_SCHEMA.MAPPED_ITEM' IN
                        TYPEOF(item))
                                 AND
                       ('PRESENTATION_DEFINITION_SCHEMA.'+
                        'TABLE_RECORD_REPRESENTATION' IN
                         TYPEOF(item\mapped_item.mapping_source.
                                    mapped_representation ))
                     );
REPEAT i := 1 TO HIINDEX(mapped_item_set);
    table_record_rep_set := table_record_rep_set +
           mapped_item_set[i].mapping_source.mapped_representation;
  END_REPEAT;

  symbol_rep_rel_set := bag_to_set (USEDIN(table_rep,
                                'REPRESENTATION_SCHEMA.'+
                                'REPRESENTATION_RELATIONSHIP.REP_1'));

  REPEAT i := 1 TO HIINDEX(symbol_rep_rel_set);
     table_record_rep_set := table_record_rep_set +
              symbol_rep_rel_set[i]\representation_relationship.rep_2;
  END_REPEAT;
```

```
  IF SIZEOF(QUERY( table_record_rep <* table_record_rep_set |
        (SIZEOF(QUERY( rep_rel <* USEDIN(table_record_rep,
                              'REPRESENTATION_SCHEMA.'+
                              'REPRESENTATION_RELATIONSHIP.REP_1') |
                         ('PRESENTATION_DEFINITION_SCHEMA.' +
                         'SYMBOL_REPRESENTATION_RELATIONSHIP' IN
                         TYPEOF(rep_rel))
                         AND
                         (rep_rel.rep_2 :=: field)
                         )) > 0)
                         OR
                (SIZEOF(QUERY(item <* table_record_rep.items |
                          ('REPRESENTATION_SCHEMA.MAPPED_ITEM' IN
                           TYPEOF(item))
                                  AND
                          (field :=: item\mapped_item.mapping_source.
                                     mapped_representation )
                           )) > 0)
              )) = 0 THEN
    RETURN(FALSE);
  END_IF;

  RETURN(TRUE);

END_FUNCTION;
(*
```

Clause 6, p. 74

The EXPRESS specification for the **presentation_appearance_schema** *did not include a reference to required data type. The first required data type is an entity data type, the group for the amended SELECT type* **style_context_select**. *The second required reference is a function, the* **bag_to_set** *for the EXPRESS specifications changed in* **acyclic_occlusion_precedence**. *Add the following EXPRESS specification before the 'REFERENCE FROM MEASURE_SCHEMA':*

```
REFERENCE FROM group_schema
    (group);
```

Delete the following EXPRESS specification:

```
REFERENCE FROM support_resource_schema
    (label);
```

Replace with the following EXPRESS specification:

```
REFERENCE FROM support_resource_schema
    (label,
     bag_to_set);
```

Clause 6.3.1, p. 80

The possibility to control the presentation style by a layer is a fundamental concept of ISO 10303-46. However the EXPRESS specification for the type **style_context_select** *did not include the necessary entities. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
TYPE style_context_select = SELECT
  (group,
   presentation_layer_assignment,
   representation,
   representation_item,
   presentation_set);
END_TYPE;
(*
```

Clause 6.3.43, p. 96

The restriction of invisibility to **presentation_representation** *does not satisfy the requirement to define a complete model as invisible. Include the entity representation instead of* **presentation_representation** *in the SELECT type* **invisible_item**. *Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
TYPE invisible_item = SELECT
  (styled_item,
   presentation_layer_assignment,
   representation);
END_TYPE;
(*
```

Clause 6.6.12, p.106

The EXPRESS specification for ***draughting_pre_defined_curve_font*** *defined below are required for reference from other parts of ISO 10303. Add the following as clause 6.6.12 after clause 6.6.11.*

6.6.12 draughting_pre_defined_curve_font

A **draughting_pre_defined_curve_font** is a **pre_defined_curve_font** that is identified by name.

EXPRESS specification:

```
*)
ENTITY draughting_pre_defined_curve_font
  SUBTYPE OF (pre_defined_curve_font);
WHERE
  WR1: SELF.name IN
```

```
        ['continuous',
         'chain',
         'chain double dash',
         'dashed',
         'dotted'];
END_ENTITY;
(*
```

Formal propositions:

WR1: The name of the **draughting_pre_defined_curve_font** shall be 'continuous', 'chain', 'chain double dash', 'dashed', or 'dotted'.

Attribute value definitions:

Table 2 states the lengths of each line segment and space, in millimetres, corresponding to each of the predefined curve fonts that are specified in this part of ISO 10303. If the **pre_defined_curve_font** is used as part of the definition of a **curve_style_font_and_scaling**, then the given lengths are those when the **curve_font_scaling** attribute has the value 1.0.

NOTE 1 - The **curve_style_font_and_scaling** entity is defined in the **presentation_appearance_schema** in ISO 10303-46.

NOTE 2 - Illustrations of curve fonts are given in Figure 1.

Table 2 – Line segment and space lengths for predefined curve fonts

Curve pattern name	Segment (mm)	Space (mm)	Segment (mm)	Space (mm)	Segment (mm)	Space (mm)	Number of segments
continuous							0
dashed	4.0	1.5					2
Chain	7.0	1.0	1.0	1.0			4
Chain double dash	7.0	1.0	1.0	1.0	1.0	1.0	6
dotted	1.0	1.0					2

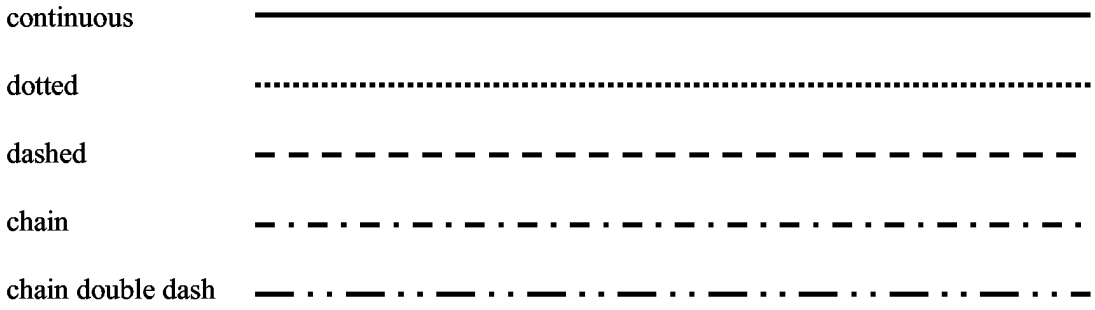

Figure 1 – Illustration of predefined curve fonts

Clause 6.9.10, p.124
*The EXPRESS specification for **text_style_with_mirror** does not specify in the definition or in the EXPRESS specification that the axis_2_placement has to be founded in the appropriate context. Add the following paragraph after Attribute definitions: and before clause 6.9.11.*

Informal propositions:

IP1: Text_style_with_mirror.mirror_placement shall have the axis2_placement founded in the same context as the text that is being mirrored.

Clause 6.13.1, p. 130

The EXPRESS specification for the FUNCTION **acyclic_occlusion_precedence** *contained logical errors in the function body. The assignment to variable 'x' requires a 'SET' and not a 'BAG'. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
FUNCTION acyclic_occlusion_precedence
   ( relation : occlusion_precedence;
     set_of_lower : SET OF hiding_or_blanking_select ) : BOOLEAN;
   LOCAL
      x : SET OF occlusion_precedence;
      local_set_of_lower : SET OF hiding_or_blanking_select;
   END_LOCAL;
   REPEAT i:=1 TO HIINDEX(set_of_lower);
      IF relation.higher_precedence :=: set_of_lower[i] THEN
         RETURN(FALSE);
      END_IF;
   END_REPEAT;
   x := bag_to_set (USEDIN ( relation.higher_precedence,
                  'PRESENTATION_APPEARANCE_SCHEMA.'+
           'OCCLUSION_PRECEDENCE.LOWER_PRECEDENCE'));
   local_set_of_lower := set_of_lower + relation.higher_precedence;
   IF SIZEOF (x) > 0 THEN
      REPEAT i:=1 TO HIINDEX (x);
         If NOT acyclic_occlusion_precedence(x[i] ,
                                             local_set_of_lower) THEN
            RETURN (FALSE);
         END_IF;
      END_REPEAT;
   END_IF;
   RETURN (TRUE);
END_FUNCTION;
(*
```

Clause 7.3.13, p.139

The EXPRESS specification of **colour_associated** *contained logical errors in the attribute declaration. Attribute 'name' requires a type 'label' and not 'colour'. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
ENTITY colour_associated
  SUBTYPE OF (colour);
  name :                  label;
  variable_to_be_shown : SET [1:?] OF REAL;
  mapping              : colour_association_table;
END_ENTITY;
(*
```

Clause 7.3.20, p.142

The EXPRESS specification for ***draughting_pre_defined_colour*** *defined below are required for reference from other parts of ISO 10303. Add the following as clause 7.3.20 after clause 7.3.19 and before the END_SCHEMA EXPRESS declaration.*

7.3.20 draughting_pre_defined_colour

A **draughting_pre_defined_colour** is a **pre_defined_colour** that is identified by name.

EXPRESS specification:

```
*)
ENTITY draughting_pre_defined_colour
  SUBTYPE OF (pre_defined_colour);
WHERE
  WR1: SELF.name IN
       ['red',
        'green',
        'blue',
        'yellow',
        'magenta',
        'cyan',
        'black',
        'white'];
END_ENTITY;
(*
```

Formal propositions:

WR1: The name of the **draughting_pre_defined_colour** shall be 'red', 'green', 'blue', 'yellow', 'magenta', 'cyan', 'black', or 'white'.

Attribute value definitions:

Table 1 states the RGB values corresponding to each of the predefined colours that are specified by this part of ISO 10303.

Table 1 – RGB colours for predefined colours

Colour name	Red	Green	Blue
black	0.0	0.0	0.0
red	1.0	0.0	0.0
green	0.0	1.0	0.0
blue	0.0	0.0	1.0
yellow	1.0	1.0	0.0
magenta	1.0	0.0	1.0
cyan	0.0	1.0	1.0
white	1.0	1.0	1.0

Clause 7.3.21, p.142

*The EXPRESS specification for **draughting_pre_text_font** defined below is required for reference from other parts of ISO 10303. Add the following as clause 7.3.21 after clause 7.3.20 and before the END_SCHEMA EXPRESS declaration.*

7.3.21 draughting_pre_defined_text_font

A **draughting_pre_defined_text_font** is a **pre_defined_text_font** that is identified by name. The definition of the appearance of each **draughting_pre_defined_text_font** is given in ISO 3098.

EXPRESS specification:

```
*)
ENTITY draughting_pre_defined_text_font
   SUBTYPE of (pre_defined_text_font);
WHERE
   WR1: SELF.name[1:8] = 'ISO 3098';
END_ENTITY;
(*
```

Formal propositions:

WR1: The **name** of the **draughting_pre_defined_text_font** shall be defined by 'ISO 3098'.

Attribute value definitions:

The **draughting_pre_defined_text_font**s are defined by ISO 3098-0.

NOTE Prior usage of ISO 10303-46 utilized the following:
- **ISO 3098-1 font A**: the text font denoted as Lettering A in clause 3 of ISO 3098-1.
- **ISO 3098-1 font B**: the text font denoted as Lettering B in clause 3 of ISO 3098-1.

Annex A, p. 143

With the changes identified in this Technical Corrigendum, the list of short names of entities is incomplete. Add the following rows in the existing tale in the correct alphabetical order:

Entity names	Short names
CAMERA_IMAGE_3D_WITH_SCALE	CI3WS
DRAUGHTING_PRE_DEFINED_COLOUR	DPDC
DRAUGHTING_PRE_DEFINED_CURVE_FONT	DPDCF
DRAUGHTING_PRE_DEFINED_TEXT_FONT	DPDTF

Annex B.1, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for this part of ISO 10303 has changed. Remove the object identifier for the document and replace with the following:

{ iso standard 10303 part(46) version (3) }

Annex B.2.1, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_organisation_schema has changed. Remove the object identifier for the presentation_organisation_schema and replace with the following:

{ iso standard 10303 part(46) version (3) schema(1) presentation-organisation-schema(1) }

Annex B.2.2, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_definition_schema has changed. Remove the object identifier for the presentation_definition_schema and replace with the following:

{ iso standard 10303 part(46) version (3) schema(1) presentation-definition-schema(2) }

Annex B.2.3, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_appearance_schema has changed. Remove the object identifier for the presentation_appearance_schema and replace with the following:

{ iso standard 10303 part(46) version (3) schema(1) presentation-appearance-schema(3) }

Annex B.2.4, p. 151

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_resource_schema has changed. Remove the object identifier for the presentation_resource_schema and replace with the following:

{ iso standard 10303 part(46) version (3) schema(1) presentation-resource-schema(4) }

Annex C, p. 152
With the changes identified in this Technical Corrigendum, the EXPRESS contained in digital form is incorrect. Replace the contents of the annex with the following:

This annex provides a listing of the EXPRESS entity names and corresponding short names as specified in this part of ISO 10303. It also provides a listing of the complete EXPRESS schema specified in this part of ISO 10303 without comments or other explanatory text. This annex is available in computer-interpretable form and can be found at the following URLs:

Short names: http://www.mel.nist.gov/div826/subject/apde/snr/
EXPRESS: http://www.mel.nist.gov/step/parts/part046/is/tc2/

If there is difficulty accessing these sites contact ISO Central Secretariat or contact the ISO TC 184/SC4 Secretariat directly at: sc4sec@cme.nist.gov.

NOTE - The information provided in computer-interpretable form at the above URLs is informative. The information that is contained in the body of this part of ISO 10303 is normative.

Annex E, p. 159, 160, 173,177, 197
The EXPRESS-G diagrams in annex E should be changed to take account of the additions identified above. Modify EXPRESS-G diagram figure E.3 to include the additional subtype of ***camera_image_3d_with_scale*** *to the entity* ***camera_image.*** *The EXPRESS-G diagram figure E.4 should be changed to take account of the revised definition of* **view_volume**. *Modify figure E.4 to show* **view_volume** *as a subtype of* **founded_item** *imported from representation schema. The EXPRESS-G diagram figure E.17 should be changed to take account of the revised definition of* **style_context_select**. *Modify figure E.17 to include group and* **presentation_layer_assignment** *in the SELECT. Modify EXPRESS-G diagram figure E.21 to include the additional subtype of* ***draughting_pre_defined_curve_font*** *to* ***pre_defined_curve_font***. *The EXPRESS-G diagram figure E.37 should be changed to take account of the revised definition of* **invisible_item**. *Modify figure E.37 to include representation instead of* **presentation_representation** *in the SELECT. Modify EXPRESS-G figure E.40 to include the subtype of* ***draughting_pre_defined_text_font*** *to* ***pre_defined_text_font***. *Modify EXPRESS-G figure E.41 to include the additional subtype of* ***draughting_pre_defined_colour*** *to* ***pre_defined_colour***.

INTERNATIONAL STANDARD ISO 10303-46:1994
TECHNICAL CORRIGENDUM 2

Published 2002-05-15

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

Part 46: Integrated generic resources: Visual presentation

TECHNICAL CORRIGENDUM 2

Systèmes d'automatisation industrielle et intégration — Représentation et échange de données de produits — Partie 46: Ressources génériques intégrées: Présentation visuelle

RECTIFICATIF TECHNIQUE 2

Technical Corrigendum 2 to International Standard ISO 10303-46:1994 was prepared by Technical Committee ISO/TC 184, *Industrial automation systems and integration*, Subcommittee SC 4, *Industrial data*.

Introduction

This corrigendum applies to ISO 10303-46:1994 as corrected by ISO 10303-46:1994/Cor.1:1999. For the convenience of the user, this corrigendum also includes the content of corrigendum 1.

The purpose of the modifications to the text of ISO 10303-46:1994 is to correct errors in the EXPRESS, to clarify a definition, to correct errors in Informal propositions and Formal propositions, to correct errors identified in the ballot for ISO 10303-518, and to replace the object identifier for the document and the schemas.

ICS 25.040.40 **Ref. No. ISO 10303-46:1994/Cor.2:2002(E)**

Modifications to the text of ISO 10303-46:1994

Clause 2, p. 2
The Normative references require an additional normative reference for the correction identified in clause 7.3.21. Add the following to the list of Normative references:

ISO 3098-0:1977, *Technical product documentation — Lettering — Part 0: General requirements*

Clause 4, p. 5
The EXPRESS specification of ***camera_image_3d_with_scale*** *and* ***aspect_ratio,*** *defined below, requires additional EXPRESS external references. Remove the following:*

```
REFERENCE FROM presentation_resource_schema
   (colour,
    planar_box,
    presentation_scaled_placement);

REFERENCE FROM measure_schema
   (length_measure,
    positive_plane_angle_measure);
```

Replace with the following:

```
REFERENCE FROM presentation_resource_schema
   (colour,
    planar_box,
    planar_extent,
    presentation_scaled_placement);

REFERENCE FROM measure_schema
   (length_measure,
    positive_ratio_measure,
    positive_plane_angle_measure);
```

The EXPRESS specification for the **presentation_organization_schema** *did not include a reference to required data type. The first required data type is an entity data type, the* **annotation_occurrence** *for the Formal propositions in* **area_dependent_annotation_representation** *and* **view_dependent_annotation_representation**. *The second required data type is an entity data type, the symbol_representation for the Formal propositions in* **symbol_representation_rule**. *The third required data type is an entity data type, the* **symbol_representation_relationship** *for the Formal propositions in* **symbol_representation_rule**. *The fourth required data type is an entity data type, the* **styled_item** *for the Formal propositions in* **camera_model** *and* **light_source**. *The fifth required data type is an entity data type, the* **founded_item**. *It is required to be referenced since it is now a supertype of* **view_volume**. *Add the following to the EXPRESS specification between the 'SCHEMA presentation_organization_schema;' and the 'REFERENCE FROM presentation_resource_schema':*

```
REFERENCE FROM presentation_definition_schema
    (annotation_occurrence,
     symbol_representation,
     symbol_representation_relationship);

REFERENCE FROM presentation_appearance_schema
    (styled_item);
```

Delete the following EXPRESS specification:

```
REFERENCE FROM representation_schema
    (item_defined_transformation,
     item_in_context,
     mapped_item,
     representation,
     representation_item,
     representation_map,
     representation_relationship,
     representation_relationship_with_transformation);
```

Replace with the following EXPRESS specification:

```
REFERENCE FROM representation_schema
    (founded_item,
     item_defined_transformation,
     item_in_context,
     mapped_item,
     representation,
     representation_item,
     representation_map,
     representation_relationship,
     representation_relationship_with_transformation);
```

With the addition of the **annotation_occurrence**, **symbol_representation**, **symbol_representation_relationship** *and* **styled_item** *to the* **presentation_organization_schema**, *NOTE 1 changed. Delete NOTE 1 and replace with the following:*

NOTE 1 The schemas referenced above can be found in the following parts of ISO 10303:

Presentation_definition_schema	Clause 5 of this part of ISO 10303
Presentation_appearance_schema	Clause 6 of this part of ISO 10303
Presentation_resource_schema	Clause 7 of this part of ISO 10303
Geometry_schema	ISO 10303-42
Representation_schema	ISO 10303-43
Measure_schema	ISO 10303-41
Support_resource_schema	ISO 10303-41

Clause 4.3.45, p. 13

The Informal proposition of **layered_item** *contradicts to the intended use of* **presentation_layer_assignment**. *The type of* **representation_item***s assigned to a layer shall not be restricted. Remove Informal proposition IP1.*

Clause 4.5.5, p. 26

The EXPRESS specification of **view_volume** *is revised to make it a subtype of* **founded_item** *in order to provide a representation context for the* **projection_point** *and* **planar_box** *attributes. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
ENTITY view_volume
  SUBTYPE OF (founded_item);
  projection_type            : central_or_parallel;
  projection_point           : cartesian_point;
  view_plane_distance        : length_measure;
  front_plane_distance       : length_measure;
  front_plane_clipping       : BOOLEAN;
  back_plane_distance        : length_measure;
  back_plane_clipping        : BOOLEAN;
  view_volume_sides_clipping : BOOLEAN;
  view_window                : planar_box;
END_ENTITY;
(*
```

Add the following note at the end of the entity description:

NOTE Since **view_volume** is not a subtype of **geometric_representation_item** the instances of **cartesian_point** which is the **projection_point** attribute and **planar_box** which is the **view_window** attribute are not associated in the usual way with the **geometric_representation_context** of each **representation** using a **camera_model_d3** containing this **view_volume**. The **geometric_representation_context** is associated via the **founded_item** supertype.

Clause 4.5.9, p. 31

The EXPRESS specification of **light_source** *contained logical errors in the WHERE rule. WR1 requires a role name qualified by attribute name 'ITEM' for argument 2 of built-in function USEDIN. Delete the current WR1 and replace WR1 with the following:*

```
WR1: SIZEOF(USEDIN(SELF,'PRESENTATION_APPEARANCE_SCHEMA.'+
          'STYLED_ITEM.ITEM')) = 0;
```

Clause 4.5.14, p. 35

The description of the Formal propositions does not give a correct explanation of WR2. Remove the description of WR2 and replace with the following:

WR2: The target of the mapping shall be a **planar_box**.

Clause 4.5.16, p. 35
The EXPRESS specification for ***camera_image_3d_with_scale*** *defined below are required for reference from other parts of ISO 10303. Add the following as clause 4.5.16 after clause 4.5.15*

4.5.16 camera_image_3d_with_scale

A **camera_image_3d_with_scale** is a **camera_image** that projects three-dimensional geometry and has a derived scale. The scale is the ratio between the size of the viewport and the size of the **view_window** of the **view_volume**.

EXPRESS specification:

```
*)
ENTITY camera_image_3d_with_scale
  SUBTYPE OF (camera_image);
DERIVE
  scale: positive_ratio_measure := ((SELF\mapped_item.mapping_target\
         planar_extent.size_in_x) / (SELF\mapped_item.mapping_source.
         mapping_origin\camera_model_d3.perspective_of_volume.view_window.
         size_in_x));
WHERE
  WR1: ('PRESENTATION_ORGANIZATION_SCHEMA.CAMERA_MODEL_D3'
       IN TYPEOF (SELF\mapped_item.mapping_source.mapping_origin));
  WR2: aspect_ratio(SELF\mapped_item.mapping_target) =
       aspect_ratio(SELF\mapped_item.mapping_source.mapping_origin\
       camera_model_d3.perspective_of_volume.view_window);
  WR3: SELF\mapped_item.mapping_source.mapping_origin\camera_model_d3.
       perspective_of_volume.front_plane_clipping
       AND
       SELF\mapped_item.mapping_source.mapping_origin\camera_model_d3.
       perspective_of_volume.view_volume_sides_clipping;
  WR4: (SELF\mapped_item.mapping_target\planar_extent.size_in_x > 0)
       AND
       (SELF\mapped_item.mapping_target\planar_extent.size_in_y > 0);
  WR5: (SELF\mapped_item.mapping_source.mapping_origin\camera_model_d3.
       perspective_of_volume.view_window.size_in_x > 0)
       AND
       (SELF\mapped_item.mapping_source.mapping_origin\camera_model_d3.
       perspective_of_volume.view_window.size_in_y > 0);
  WR6: ('GEOMETRY_SCHEMA.' +
       'AXIS2_PLACEMENT_2D' IN TYPEOF (SELF\mapped_item.
       mapping_target\planar_box.placement))
       AND NOT ('GEOMETRY_SCHEMA.' +
       'AXIS2_PLACEMENT_3D' IN TYPEOF (SELF\mapped_item.
       mapping_target\planar_box.placement));
END_ENTITY;
(*
```

Attribute definitions:

scale: the **positive_ratio_measure** derived from the rectangular size of the viewport and the rectangular size of the **view_volume** of the **camera_model**.

Formal propositions:

WR1: The source of the projection shall be a **camera_model_d3**.

WR2: The aspect ratio of the viewport shall equal the aspect ratio of the **view_window** of the **view_volume**.

WR3: The geometry of the projected representation shall be clipped against the plane represented by the **front_plane_distance** and the planes which are the sides of the volume defined by the **view_volume**.

WR4: The rectangular size of the viewport shall be specified by positive values.

WR5: The rectangular size of the **view_window** shall be specified by positive values.

WR6: The drawing space of a **camera_image_3d_with_scale** shall be specified in a 2D coordinate system.

Informal propositions:

IP1: The horizontal and vertical components of the viewport shall be parallel to the corresponding components of the **view_window** of the **view_volume**.

Clause 4.9.1, p. 39
The EXPRESS specification for the FUNCTION **acyclic_presentation_representation_relationship** *contained logical errors in the function body. The assignment to variable 'x' requires a 'SET' and not a 'BAG'. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
FUNCTION acyclic_presentation_representation_relationship
  ( relation : presentation_representation_relationship;
    children : SET OF presentation_representation ) : BOOLEAN;

  LOCAL
    x : SET OF presentation_representation_relationship;
    local_children : SET OF presentation_representation;
  END_LOCAL;

  REPEAT i:=1 TO HIINDEX(children);
    IF relation\representation_relationship.rep_1 :=: children[i] THEN
       RETURN(FALSE);
    END_IF;
  END_REPEAT;

  x := bag_to_set (USEDIN ( relation\representation_relationship.rep_1,
                  'REPRESENTATION_SCHEMA.'+
                  'REPRESENTATION_RELATIONSHIP.REP_2'));
  local_children := children + relation\representation_relationship.rep_1;
```

```
  IF SIZEOF (x) > 0 THEN
    REPEAT i:=1 TO HIINDEX (x);
       IF NOT acyclic_presentation_representation_relationship
              (x[i] , local_children) THEN
         RETURN (FALSE);
       END_IF;
    END_REPEAT;
  END_IF;

  RETURN (TRUE);

END_FUNCTION;
(*
```

Clause 4.9.2, p.39
The EXPRESS specification for ***aspect_ratio*** *defined below are required for reference from other parts of ISO 10303. This entity was incorrectly defined in ISO 10303-517. Add the following as clause 4.9.2 after clause 4.9.1 and before the END_SCHEMA EXPRESS specification:*

4.9.2 aspect ratio

The **aspect_ratio** function checks that both the attributes, size_in_x and size_in_y, have positivie values and returns a **positive_ratio_measure** that is the ratio of length to height for a given **planar_box**. In other cases, an indeterminate value is returned.

EXPRESS specification:

```
*)
FUNCTION aspect_ratio (p : planar_box) : positive_ratio_measure;
(* if the dimensions of the planar_box are greater than zero,
      compute the aspect ratio and return the resulting value. *)
   IF (p.size_in_x > 0.) AND (p.size_in_y > 0.) THEN
      RETURN (p.size_in_x / p.size_in_y);
   ELSE
      RETURN (?);
   END_IF;
END_FUNCTION;
(*
```

Argument definitions:

p: The input **planar_box** to be checked.

Clause 5, p. 40
The EXPRESS specification for the **presentation_definition_schema** *did not include a reference to a required data type. The required reference is a function, the* **bag_to_set** *for the EXPRESS specifications changed in* **acyclic_presentation_representation_relationship**, **acyclic_symbol_representation_relationship** *and* **field_in_table**. *Delete the following EXPRESS specification:*

```
REFERENCE FROM support_resource_schema
    (label,
     text);
```

Replace with the following EXPRESS specification:

```
REFERENCE FROM support_resource_schema
    (label,
     text,
     bag_to_set);
```

Clause 5.4.13, p.53

The EXPRESS specification for ***table_record_representation*** *was incorrect. The local rules of table_record_representation are incorrect since the variable map_item is of type REPRESENTATION,, but it is used as argument to the function using_representations, which accepts only variables of type FOUNDED_ITEM_SELECT. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
ENTITY table_record_representation
  SUBTYPE OF (symbol_representation);
WHERE
  WR1: (SIZEOF(USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                            'REPRESENTATION_RELATIONSHIP.REP_2')) > 0)
                       OR
       (SIZEOF(QUERY( map_item <* USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                                               'REPRESENTATION_MAP.'+
                                               'MAPPED_REPRESENTATION') |
         SIZEOF(QUERY( mi <* USEDIN(map_item, 'REPRESENTATION_SCHEMA.'+
                                              'MAPPED_ITEM.'+
                                              'MAPPING_SOURCE') |
                                         'PRESENTATION_DEFINITION_SCHEMA.'+
                                              'TABLE_REPRESENTATION' IN
             TYPEOF (using_representations (mi)) )) > 0))
                    > 0);
END_ENTITY;
(*
```

Clause 5.4.14, p.54

The EXPRESS specification for ***table_record_field_representation*** *was incorrect. The local rules of table_record_field_representation are incorrect since the variable map_item is of type REPRESENTATION,, but it is used as argument to the function using_representations, which accepts only variables of type FOUNDED_ITEM_SELECT. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
ENTITY table_record_field_representation
  SUBTYPE OF (symbol_representation);
WHERE
  WR1: (SIZEOF(USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                            'REPRESENTATION_RELATIONSHIP.REP_2')) > 0)
                       OR
       (SIZEOF(QUERY( map_item <* USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                                               'REPRESENTATION_MAP.'+
                                               'MAPPED_REPRESENTATION') |
         SIZEOF(QUERY( mi <* USEDIN(map_item, 'REPRESENTATION_SCHEMA.'+
                                              'MAPPED_ITEM.'+
```

```
                                                    'MAPPING_SOURCE') |
                                                'PRESENTATION_DEFINITION_SCHEMA.'+
                                                  'TABLE_RECORD_REPRESENTATION' IN
                TYPEOF (using_representations (mi)) )) > 0))
                       > 0);
END_ENTITY;
(*
```

Clause 5.6.2, p. 72

The EXPRESS specification for the FUNCTION **acyclic_symbol_representation_relationship** *contained logical errors in the function body. The assignment to variable 'x' requires a 'SET' and not a 'BAG'. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
FUNCTION acyclic_symbol_representation_relationship
  (relation : symbol_representation_relationship;
   children : SET OF symbol_representation ) : BOOLEAN;
  LOCAL
    x : SET OF symbol_representation_relationship;
    local_children : SET OF symbol_representation;
  END_LOCAL;

  REPEAT i:=1 TO HIINDEX(children);
    IF relation\representation_relationship.rep_1 :=: children[i] THEN
      RETURN(FALSE);
    END_IF;
  END_REPEAT;

  x := bag_to_set (USEDIN ( relation\representation_relationship.rep_1,
                'REPRESENTATION_SCHEMA.'+
                'REPRESENTATION_RELATIONSHIP.'+ 'REP_2'));
  local_children := children + relation\representation_relationship.rep_1;

  IF SIZEOF (x) > 0 THEN
    REPEAT i:=1 TO HIINDEX (x);
      IF NOT acyclic_symbol_representation_relationship(x[i] ,
                                                  local_children) THEN
        RETURN (FALSE);
      END_IF;
    END_REPEAT;
  END_IF;

  RETURN (TRUE);

END_FUNCTION;
(*
```

Clause 5.6.3, p. 73

The EXPRESS specification for the FUNCTION **field_in_table** *contained spelling and logical errors. The expression in the first QUERY requires a string 'PRESENTATION_DEFINITION_SCHEMA. TABLE_RECORD_REPRESENTATION' and not a string 'PRESENTATION_DEFINITIONS_ SCHEMA.TABLE_RECORD_REPRESENTATION'. The declaration of variable 'symbol_rep_rel_set' requires a 'SET" and not a 'SET[1:?]'. The declaration of variable mapped_item_set' requires a 'SET" and not a 'SET[1:?]'. The declaration of variable 'table_record_rep_set' requires a 'SET" and not a 'SET[1:?]'.The assignment to variable 'symbol_rep_rel_set' requires a 'SET" and not a 'BAG'. The built-in function USEDIN in the second QUERY requires a role name qualified by an attribute name as argument 2. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
FUNCTION field_in_table (field : table_record_field_representation;
                         table : annotation_table_occurrence): BOOLEAN;
  LOCAL
    table_rep : table_representation;
    symbol_rep_rel_set : SET OF symbol_representation_relationship;
    mapped_item_set : SET OF mapped_item;
    table_record_rep_set : SET OF table_record_representation := [];
  END_LOCAL;

  table_rep := table\styled_item.item\mapped_item.mapping_source.
    mapped_representation;
  mapped_item_set := QUERY(item <* table_rep.items |
                       ('REPRESENTATION_SCHEMA.MAPPED_ITEM' IN
                        TYPEOF(item))
                                 AND
                       ('PRESENTATION_DEFINITION_SCHEMA.'+
                        'TABLE_RECORD_REPRESENTATION' IN
                         TYPEOF(item\mapped_item.mapping_source.
                                    mapped_representation ))
                     );
REPEAT i := 1 TO HIINDEX(mapped_item_set);
    table_record_rep_set := table_record_rep_set +
           mapped_item_set[i].mapping_source.mapped_representation;
  END_REPEAT;

  symbol_rep_rel_set := bag_to_set (USEDIN(table_rep,
                                'REPRESENTATION_SCHEMA.'+
                                'REPRESENTATION_RELATIONSHIP.REP_1'));

  REPEAT i := 1 TO HIINDEX(symbol_rep_rel_set);
     table_record_rep_set := table_record_rep_set +
              symbol_rep_rel_set[i]\representation_relationship.rep_2;
  END_REPEAT;
```

```
  IF SIZEOF(QUERY( table_record_rep <* table_record_rep_set |
        (SIZEOF(QUERY( rep_rel <* USEDIN(table_record_rep,
                              'REPRESENTATION_SCHEMA.'+
                              'REPRESENTATION_RELATIONSHIP.REP_1') |
                         ('PRESENTATION_DEFINITION_SCHEMA.' +
                         'SYMBOL_REPRESENTATION_RELATIONSHIP' IN
                         TYPEOF(rep_rel))
                         AND
                         (rep_rel.rep_2 :=: field)
                         )) > 0)
                         OR
                (SIZEOF(QUERY(item <* table_record_rep.items |
                          ('REPRESENTATION_SCHEMA.MAPPED_ITEM' IN
                           TYPEOF(item))
                                  AND
                          (field :=: item\mapped_item.mapping_source.
                                     mapped_representation )
                           )) > 0)
              )) = 0 THEN
    RETURN(FALSE);
  END_IF;

  RETURN(TRUE);

END_FUNCTION;
(*
```

Clause 6, p. 74

The EXPRESS specification for the **presentation_appearance_schema** *did not include a reference to required data type. The first required data type is an entity data type, the group for the amended SELECT type* **style_context_select**. *The second required reference is a function, the* **bag_to_set** *for the EXPRESS specifications changed in* **acyclic_occlusion_precedence**. *Add the following EXPRESS specification before the 'REFERENCE FROM MEASURE_SCHEMA':*

```
REFERENCE FROM group_schema
    (group);
```

Delete the following EXPRESS specification:

```
REFERENCE FROM support_resource_schema
    (label);
```

Replace with the following EXPRESS specification:

```
REFERENCE FROM support_resource_schema
    (label,
     bag_to_set);
```

Clause 6.3.1, p. 80

The possibility to control the presentation style by a layer is a fundamental concept of ISO 10303-46. However the EXPRESS specification for the type **style_context_select** *did not include the necessary entities. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
TYPE style_context_select = SELECT
  (group,
   presentation_layer_assignment,
   representation,
   representation_item,
   presentation_set);
END_TYPE;
(*
```

Clause 6.3.43, p. 96

The restriction of invisibility to **presentation_representation** *does not satisfy the requirement to define a complete model as invisible. Include the entity representation instead of* **presentation_representation** *in the SELECT type* **invisible_item**. *Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
TYPE invisible_item = SELECT
  (styled_item,
   presentation_layer_assignment,
   representation);
END_TYPE;
(*
```

Clause 6.6.12, p.106

The EXPRESS specification for ***draughting_pre_defined_curve_font*** *defined below are required for reference from other parts of ISO 10303. Add the following as clause 6.6.12 after clause 6.6.11.*

6.6.12 draughting_pre_defined_curve_font

A **draughting_pre_defined_curve_font** is a **pre_defined_curve_font** that is identified by name.

EXPRESS specification:

```
*)
ENTITY draughting_pre_defined_curve_font
  SUBTYPE OF (pre_defined_curve_font);
WHERE
  WR1: SELF.name IN
```

```
        ['continuous',
         'chain',
         'chain double dash',
         'dashed',
         'dotted'];
END_ENTITY;
(*
```

Formal propositions:

WR1: The name of the **draughting_pre_defined_curve_font** shall be 'continuous', 'chain', 'chain double dash', 'dashed', or 'dotted'.

Attribute value definitions:

Table 2 states the lengths of each line segment and space, in millimetres, corresponding to each of the predefined curve fonts that are specified in this part of ISO 10303. If the **pre_defined_curve_font** is used as part of the definition of a **curve_style_font_and_scaling**, then the given lengths are those when the **curve_font_scaling** attribute has the value 1.0.

NOTE 1 - The **curve_style_font_and_scaling** entity is defined in the **presentation_appearance_schema** in ISO 10303-46.

NOTE 2 - Illustrations of curve fonts are given in Figure 1.

Table 2 – Line segment and space lengths for predefined curve fonts

Curve pattern name	Segment (mm)	Space (mm)	Segment (mm)	Space (mm)	Segment (mm)	Space (mm)	Number of segments
continuous							0
dashed	4.0	1.5					2
Chain	7.0	1.0	1.0	1.0			4
Chain double dash	7.0	1.0	1.0	1.0	1.0	1.0	6
dotted	1.0	1.0					2

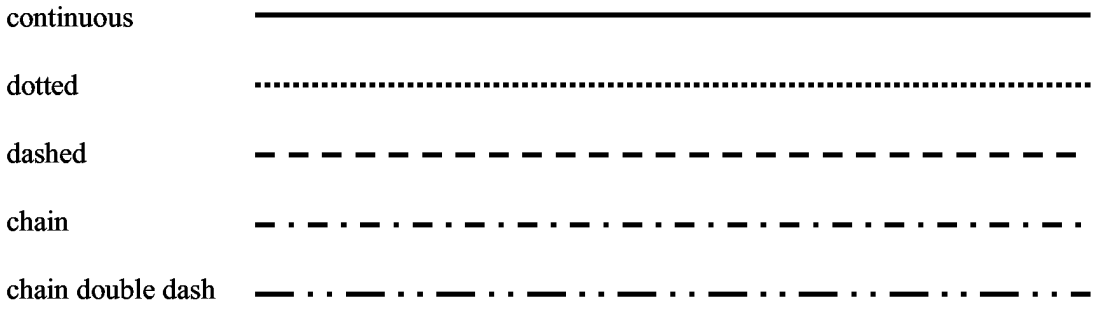

Figure 1 – Illustration of predefined curve fonts

Clause 6.9.10, p.124
*The EXPRESS specification for **text_style_with_mirror** does not specify in the definition or in the EXPRESS specification that the axis_2_placement has to be founded in the appropriate context. Add the following paragraph after Attribute definitions: and before clause 6.9.11.*

Informal propositions:

IP1: Text_style_with_mirror.mirror_placement shall have the axis2_placement founded in the same context as the text that is being mirrored.

Clause 6.13.1, p. 130

The EXPRESS specification for the FUNCTION **acyclic_occlusion_precedence** *contained logical errors in the function body. The assignment to variable 'x' requires a 'SET' and not a 'BAG'. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
FUNCTION acyclic_occlusion_precedence
   ( relation : occlusion_precedence;
     set_of_lower : SET OF hiding_or_blanking_select ) : BOOLEAN;
   LOCAL
      x : SET OF occlusion_precedence;
      local_set_of_lower : SET OF hiding_or_blanking_select;
   END_LOCAL;
   REPEAT i:=1 TO HIINDEX(set_of_lower);
      IF relation.higher_precedence :=: set_of_lower[i] THEN
         RETURN(FALSE);
      END_IF;
   END_REPEAT;
   x := bag_to_set (USEDIN ( relation.higher_precedence,
                   'PRESENTATION_APPEARANCE_SCHEMA.'+
           'OCCLUSION_PRECEDENCE.LOWER_PRECEDENCE'));
   local_set_of_lower := set_of_lower + relation.higher_precedence;
   IF SIZEOF (x) > 0 THEN
      REPEAT i:=1 TO HIINDEX (x);
         If NOT acyclic_occlusion_precedence(x[i] ,
                                             local_set_of_lower) THEN
            RETURN (FALSE);
         END_IF;
      END_REPEAT;
   END_IF;
   RETURN (TRUE);
END_FUNCTION;
(*
```

Clause 7.3.13, p.139

The EXPRESS specification of **colour_associated** *contained logical errors in the attribute declaration. Attribute 'name' requires a type 'label' and not 'colour'. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
ENTITY colour_associated
  SUBTYPE OF (colour);
  name :                  label;
  variable_to_be_shown : SET [1:?] OF REAL;
  mapping              : colour_association_table;
END_ENTITY;
(*
```

Clause 7.3.20, p.142

The EXPRESS specification for ***draughting_pre_defined_colour*** *defined below are required for reference from other parts of ISO 10303. Add the following as clause 7.3.20 after clause 7.3.19 and before the END_SCHEMA EXPRESS declaration.*

7.3.20 draughting_pre_defined_colour

A **draughting_pre_defined_colour** is a **pre_defined_colour** that is identified by name.

EXPRESS specification:

```
*)
ENTITY draughting_pre_defined_colour
  SUBTYPE OF (pre_defined_colour);
WHERE
  WR1: SELF.name IN
       ['red',
        'green',
        'blue',
        'yellow',
        'magenta',
        'cyan',
        'black',
        'white'];
END_ENTITY;
(*
```

Formal propositions:

WR1: The name of the **draughting_pre_defined_colour** shall be 'red', 'green', 'blue', 'yellow', 'magenta', 'cyan', 'black', or 'white'.

Attribute value definitions:

Table 1 states the RGB values corresponding to each of the predefined colours that are specified by this part of ISO 10303.

Table 1 – RGB colours for predefined colours

Colour name	Red	Green	Blue
black	0.0	0.0	0.0
red	1.0	0.0	0.0
green	0.0	1.0	0.0
blue	0.0	0.0	1.0
yellow	1.0	1.0	0.0
magenta	1.0	0.0	1.0
cyan	0.0	1.0	1.0
white	1.0	1.0	1.0

Clause 7.3.21, p.142
*The EXPRESS specification for **draughting_pre_text_font** defined below is required for reference from other parts of ISO 10303. Add the following as clause 7.3.21 after clause 7.3.20 and before the END_SCHEMA EXPRESS declaration.*

7.3.21 draughting_pre_defined_text_font

A **draughting_pre_defined_text_font** is a **pre_defined_text_font** that is identified by name. The definition of the appearance of each **draughting_pre_defined_text_font** is given in ISO 3098.

EXPRESS specification:

```
*)
ENTITY draughting_pre_defined_text_font
   SUBTYPE of (pre_defined_text_font);
WHERE
   WR1: SELF.name[1:8] = 'ISO 3098';
END_ENTITY;
(*
```

Formal propositions:

WR1: The **name** of the **draughting_pre_defined_text_font** shall be defined by 'ISO 3098'.

Attribute value definitions:

The **draughting_pre_defined_text_font**s are defined by ISO 3098-0.

NOTE Prior usage of ISO 10303-46 utilized the following:
- **ISO 3098-1 font A**: the text font denoted as Lettering A in clause 3 of ISO 3098-1.
- **ISO 3098-1 font B**: the text font denoted as Lettering B in clause 3 of ISO 3098-1.

Annex A, p. 143

With the changes identified in this Technical Corrigendum, the list of short names of entities is incomplete. Add the following rows in the existing tale in the correct alphabetical order:

Entity names	Short names
CAMERA_IMAGE_3D_WITH_SCALE	CI3WS
DRAUGHTING_PRE_DEFINED_COLOUR	DPDC
DRAUGHTING_PRE_DEFINED_CURVE_FONT	DPDCF
DRAUGHTING_PRE_DEFINED_TEXT_FONT	DPDTF

Annex B.1, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for this part of ISO 10303 has changed. Remove the object identifier for the document and replace with the following:

{ iso standard 10303 part(46) version (3) }

Annex B.2.1, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_organisation_schema has changed. Remove the object identifier for the presentation_organisation_schema and replace with the following:

{ iso standard 10303 part(46) version (3) schema(1) presentation-organisation-schema(1) }

Annex B.2.2, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_definition_schema has changed. Remove the object identifier for the presentation_definition_schema and replace with the following:

{ iso standard 10303 part(46) version (3) schema(1) presentation-definition-schema(2) }

Annex B.2.3, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_appearance_schema has changed. Remove the object identifier for the presentation_appearance_schema and replace with the following:

{ iso standard 10303 part(46) version (3) schema(1) presentation-appearance-schema(3) }

Annex B.2.4, p. 151

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_resource_schema has changed. Remove the object identifier for the presentation_resource_schema and replace with the following:

{ iso standard 10303 part(46) version (3) schema(1) presentation-resource-schema(4) }

Annex C, p. 152
With the changes identified in this Technical Corrigendum, the EXPRESS contained in digital form is incorrect. Replace the contents of the annex with the following:

This annex provides a listing of the EXPRESS entity names and corresponding short names as specified in this part of ISO 10303. It also provides a listing of the complete EXPRESS schema specified in this part of ISO 10303 without comments or other explanatory text. This annex is available in computer-interpretable form and can be found at the following URLs:

Short names: http://www.mel.nist.gov/div826/subject/apde/snr/
EXPRESS: http://www.mel.nist.gov/step/parts/part046/is/tc2/

If there is difficulty accessing these sites contact ISO Central Secretariat or contact the ISO TC 184/SC4 Secretariat directly at: sc4sec@cme.nist.gov.

NOTE - The information provided in computer-interpretable form at the above URLs is informative. The information that is contained in the body of this part of ISO 10303 is normative.

Annex E, p. 159, 160, 173,177, 197
The EXPRESS-G diagrams in annex E should be changed to take account of the additions identified above. Modify EXPRESS-G diagram figure E.3 to include the additional subtype of ***camera_image_3d_with_scale*** *to the entity* ***camera_image.*** *The EXPRESS-G diagram figure E.4 should be changed to take account of the revised definition of* **view_volume**. *Modify figure E.4 to show* **view_volume** *as a subtype of* **founded_item** *imported from representation schema. The EXPRESS-G diagram figure E.17 should be changed to take account of the revised definition of* **style_context_select**. *Modify figure E.17 to include group and* **presentation_layer_assignment** *in the SELECT. Modify EXPRESS-G diagram figure E.21 to include the additional subtype of* ***draughting_pre_defined_curve_font*** *to* ***pre_defined_curve_font***. *The EXPRESS-G diagram figure E.37 should be changed to take account of the revised definition of* **invisible_item**. *Modify figure E.37 to include representation instead of* **presentation_representation** *in the SELECT. Modify EXPRESS-G figure E.40 to include the subtype of* ***draughting_pre_defined_text_font*** *to* ***pre_defined_text_font***. *Modify EXPRESS-G figure E.41 to include the additional subtype of* ***draughting_pre_defined_colour*** *to* ***pre_defined_colour***.

INTERNATIONAL STANDARD ISO 10303-46:1994
TECHNICAL CORRIGENDUM 2

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

Part 46: Integrated generic resources: Visual presentation

TECHNICAL CORRIGENDUM 2

Systèmes d'automatisation industrielle et intégration — Représentation et échange de données de produits — Partie 46: Ressources génériques intégrées: Présentation visuelle

RECTIFICATIF TECHNIQUE 2

Technical Corrigendum 2 to International Standard ISO 10303-46:1994 was prepared by Technical Committee ISO/TC 184, *Industrial automation systems and integration*, Subcommittee SC 4, *Industrial data*.

Introduction

This corrigendum applies to ISO 10303-46:1994 as corrected by ISO 10303-46:1994/Cor.1:1999. For the convenience of the user, this corrigendum also includes the content of corrigendum 1.

The purpose of the modifications to the text of ISO 10303-46:1994 is to correct errors in the EXPRESS, to clarify a definition, to correct errors in Informal propositions and Formal propositions, to correct errors identified in the ballot for ISO 10303-518, and to replace the object identifier for the document and the schemas.

ICS 25.040.40 **Ref. No. ISO 10303-46:1994/Cor.2:2002(E)**

Modifications to the text of ISO 10303-46:1994

Clause 2, p. 2
The Normative references require an additional normative reference for the correction identified in clause 7.3.21. Add the following to the list of Normative references:

ISO 3098-0:1977, *Technical product documentation — Lettering — Part 0: General requirements*

Clause 4, p. 5
The EXPRESS specification of ***camera_image_3d_with_scale*** *and* ***aspect_ratio,*** *defined below, requires additional EXPRESS external references. Remove the following:*

```
REFERENCE FROM presentation_resource_schema
   (colour,
    planar_box,
    presentation_scaled_placement);

REFERENCE FROM measure_schema
   (length_measure,
    positive_plane_angle_measure);
```

Replace with the following:

```
REFERENCE FROM presentation_resource_schema
   (colour,
    planar_box,
    planar_extent,
    presentation_scaled_placement);

REFERENCE FROM measure_schema
   (length_measure,
    positive_ratio_measure,
    positive_plane_angle_measure);
```

The EXPRESS specification for the **presentation_organization_schema** *did not include a reference to required data type. The first required data type is an entity data type, the* **annotation_occurrence** *for the Formal propositions in* **area_dependent_annotation_representation** *and* **view_dependent_annotation_representation**. *The second required data type is an entity data type, the symbol_representation for the Formal propositions in* **symbol_representation_rule**. *The third required data type is an entity data type, the* **symbol_representation_relationship** *for the Formal propositions in* **symbol_representation_rule**. *The fourth required data type is an entity data type, the* **styled_item** *for the Formal propositions in* **camera_model** *and* **light_source**. *The fifth required data type is an entity data type, the* **founded_item**. *It is required to be referenced since it is now a supertype of* **view_volume**. *Add the following to the EXPRESS specification between the 'SCHEMA presentation_organization_schema;' and the 'REFERENCE FROM presentation_resource_schema':*

```
REFERENCE FROM presentation_definition_schema
    (annotation_occurrence,
     symbol_representation,
     symbol_representation_relationship);

REFERENCE FROM presentation_appearance_schema
    (styled_item);
```

Delete the following EXPRESS specification:

```
REFERENCE FROM representation_schema
    (item_defined_transformation,
     item_in_context,
     mapped_item,
     representation,
     representation_item,
     representation_map,
     representation_relationship,
     representation_relationship_with_transformation);
```

Replace with the following EXPRESS specification:

```
REFERENCE FROM representation_schema
    (founded_item,
     item_defined_transformation,
     item_in_context,
     mapped_item,
     representation,
     representation_item,
     representation_map,
     representation_relationship,
     representation_relationship_with_transformation);
```

With the addition of the **annotation_occurrence**, **symbol_representation**, **symbol_representation_relationship** *and* **styled_item** *to the* **presentation_organization_schema**, *NOTE 1 changed. Delete NOTE 1 and replace with the following:*

NOTE 1 The schemas referenced above can be found in the following parts of ISO 10303:

Presentation_definition_schema	Clause 5 of this part of ISO 10303
Presentation_appearance_schema	Clause 6 of this part of ISO 10303
Presentation_resource_schema	Clause 7 of this part of ISO 10303
Geometry_schema	ISO 10303-42
Representation_schema	ISO 10303-43
Measure_schema	ISO 10303-41
Support_resource_schema	ISO 10303-41

Clause 4.3.45, p. 13

The Informal proposition of **layered_item** *contradicts to the intended use of* **presentation_layer_assignment**. *The type of* **representation_item***s assigned to a layer shall not be restricted. Remove Informal proposition IP1.*

Clause 4.5.5, p. 26

The EXPRESS specification of **view_volume** *is revised to make it a subtype of* **founded_item** *in order to provide a representation context for the* **projection_point** *and* **planar_box** *attributes. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
ENTITY view_volume
  SUBTYPE OF (founded_item);
  projection_type            : central_or_parallel;
  projection_point           : cartesian_point;
  view_plane_distance        : length_measure;
  front_plane_distance       : length_measure;
  front_plane_clipping       : BOOLEAN;
  back_plane_distance        : length_measure;
  back_plane_clipping        : BOOLEAN;
  view_volume_sides_clipping : BOOLEAN;
  view_window                : planar_box;
END_ENTITY;
(*
```

Add the following note at the end of the entity description:

NOTE Since **view_volume** is not a subtype of **geometric_representation_item** the instances of **cartesian_point** which is the **projection_point** attribute and **planar_box** which is the **view_window** attribute are not associated in the usual way with the **geometric_representation_context** of each **representation** using a **camera_model_d3** containing this **view_volume**. The **geometric_representation_context** is associated via the **founded_item** supertype.

Clause 4.5.9, p. 31

The EXPRESS specification of **light_source** *contained logical errors in the WHERE rule. WR1 requires a role name qualified by attribute name 'ITEM' for argument 2 of built-in function USEDIN. Delete the current WR1 and replace WR1 with the following:*

```
WR1: SIZEOF(USEDIN(SELF,'PRESENTATION_APPEARANCE_SCHEMA.'+
          'STYLED_ITEM.ITEM')) = 0;
```

Clause 4.5.14, p. 35

The description of the Formal propositions does not give a correct explanation of WR2. Remove the description of WR2 and replace with the following:

WR2: The target of the mapping shall be a **planar_box**.

Clause 4.5.16, p. 35
The EXPRESS specification for ***camera_image_3d_with_scale*** *defined below are required for reference from other parts of ISO 10303. Add the following as clause 4.5.16 after clause 4.5.15*

4.5.16 camera_image_3d_with_scale

A **camera_image_3d_with_scale** is a **camera_image** that projects three-dimensional geometry and has a derived scale. The scale is the ratio between the size of the viewport and the size of the **view_window** of the **view_volume**.

EXPRESS specification:

```
*)
ENTITY camera_image_3d_with_scale
  SUBTYPE OF (camera_image);
DERIVE
  scale: positive_ratio_measure := ((SELF\mapped_item.mapping_target\
         planar_extent.size_in_x) / (SELF\mapped_item.mapping_source.
         mapping_origin\camera_model_d3.perspective_of_volume.view_window.
         size_in_x));
WHERE
  WR1: ('PRESENTATION_ORGANIZATION_SCHEMA.CAMERA_MODEL_D3'
       IN TYPEOF (SELF\mapped_item.mapping_source.mapping_origin));
  WR2: aspect_ratio(SELF\mapped_item.mapping_target) =
       aspect_ratio(SELF\mapped_item.mapping_source.mapping_origin\
       camera_model_d3.perspective_of_volume.view_window);
  WR3: SELF\mapped_item.mapping_source.mapping_origin\camera_model_d3.
       perspective_of_volume.front_plane_clipping
       AND
       SELF\mapped_item.mapping_source.mapping_origin\camera_model_d3.
       perspective_of_volume.view_volume_sides_clipping;
  WR4: (SELF\mapped_item.mapping_target\planar_extent.size_in_x > 0)
       AND
       (SELF\mapped_item.mapping_target\planar_extent.size_in_y > 0);
  WR5: (SELF\mapped_item.mapping_source.mapping_origin\camera_model_d3.
       perspective_of_volume.view_window.size_in_x > 0)
       AND
       (SELF\mapped_item.mapping_source.mapping_origin\camera_model_d3.
       perspective_of_volume.view_window.size_in_y > 0);
  WR6: ('GEOMETRY_SCHEMA.' +
       'AXIS2_PLACEMENT_2D' IN TYPEOF (SELF\mapped_item.
       mapping_target\planar_box.placement))
       AND NOT ('GEOMETRY_SCHEMA.' +
       'AXIS2_PLACEMENT_3D' IN TYPEOF (SELF\mapped_item.
       mapping_target\planar_box.placement));
END_ENTITY;
(*
```

Attribute definitions:

scale: the **positive_ratio_measure** derived from the rectangular size of the viewport and the rectangular size of the **view_volume** of the **camera_model**.

Formal propositions:

WR1: The source of the projection shall be a **camera_model_d3**.

WR2: The aspect ratio of the viewport shall equal the aspect ratio of the **view_window** of the **view_volume**.

WR3: The geometry of the projected representation shall be clipped against the plane represented by the **front_plane_distance** and the planes which are the sides of the volume defined by the **view_volume**.

WR4: The rectangular size of the viewport shall be specified by positive values.

WR5: The rectangular size of the **view_window** shall be specified by positive values.

WR6: The drawing space of a **camera_image_3d_with_scale** shall be specified in a 2D coordinate system.

Informal propositions:

IP1: The horizontal and vertical components of the viewport shall be parallel to the corresponding components of the **view_window** of the **view_volume**.

Clause 4.9.1, p. 39
The EXPRESS specification for the FUNCTION **acyclic_presentation_representation_relationship** *contained logical errors in the function body. The assignment to variable 'x' requires a 'SET' and not a 'BAG'. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
FUNCTION acyclic_presentation_representation_relationship
  ( relation : presentation_representation_relationship;
    children : SET OF presentation_representation ) : BOOLEAN;

  LOCAL
    x : SET OF presentation_representation_relationship;
    local_children : SET OF presentation_representation;
  END_LOCAL;

  REPEAT i:=1 TO HIINDEX(children);
    IF relation\representation_relationship.rep_1 :=: children[i] THEN
       RETURN(FALSE);
    END_IF;
  END_REPEAT;

  x := bag_to_set (USEDIN ( relation\representation_relationship.rep_1,
                  'REPRESENTATION_SCHEMA.'+
                  'REPRESENTATION_RELATIONSHIP.REP_2'));
  local_children := children + relation\representation_relationship.rep_1;
```

```
  IF SIZEOF (x) > 0 THEN
    REPEAT i:=1 TO HIINDEX (x);
       IF NOT acyclic_presentation_representation_relationship
              (x[i] , local_children) THEN
         RETURN (FALSE);
       END_IF;
    END_REPEAT;
  END_IF;

  RETURN (TRUE);

END_FUNCTION;
(*
```

Clause 4.9.2, p.39

The EXPRESS specification for ***aspect_ratio*** *defined below are required for reference from other parts of ISO 10303. This entity was incorrectly defined in ISO 10303-517. Add the following as clause 4.9.2 after clause 4.9.1 and before the END_SCHEMA EXPRESS specification:*

4.9.2 aspect ratio

The **aspect_ratio** function checks that both the attributes, size_in_x and size_in_y, have positivie values and returns a **positive_ratio_measure** that is the ratio of length to height for a given **planar_box**. In other cases, an indeterminate value is returned.

EXPRESS specification:

```
*)
FUNCTION aspect_ratio (p : planar_box) : positive_ratio_measure;
(* if the dimensions of the planar_box are greater than zero,
      compute the aspect ratio and return the resulting value. *)
   IF (p.size_in_x > 0.) AND (p.size_in_y > 0.) THEN
      RETURN (p.size_in_x / p.size_in_y);
   ELSE
      RETURN (?);
   END_IF;
END_FUNCTION;
(*
```

Argument definitions:

p: The input **planar_box** to be checked.

Clause 5, p. 40

The EXPRESS specification for the **presentation_definition_schema** *did not include a reference to a required data type. The required reference is a function, the* **bag_to_set** *for the EXPRESS specifications changed in* **acyclic_presentation_representation_relationship**, **acyclic_symbol_representation_relationship** *and* **field_in_table**. *Delete the following EXPRESS specification:*

```
REFERENCE FROM support_resource_schema
    (label,
     text);
```

Replace with the following EXPRESS specification:

```
REFERENCE FROM support_resource_schema
    (label,
     text,
     bag_to_set);
```

Clause 5.4.13, p.53

The EXPRESS specification for ***table_record_representation*** *was incorrect. The local rules of table_record_representation are incorrect since the variable map_item is of type REPRESENTATION,, but it is used as argument to the function using_representations, which accepts only variables of type FOUNDED_ITEM_SELECT. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
ENTITY table_record_representation
  SUBTYPE OF (symbol_representation);
WHERE
  WR1: (SIZEOF(USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                            'REPRESENTATION_RELATIONSHIP.REP_2')) > 0)
                       OR
       (SIZEOF(QUERY( map_item <* USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                                               'REPRESENTATION_MAP.'+
                                               'MAPPED_REPRESENTATION') |
         SIZEOF(QUERY( mi <* USEDIN(map_item, 'REPRESENTATION_SCHEMA.'+
                                              'MAPPED_ITEM.'+
                                              'MAPPING_SOURCE') |
                                         'PRESENTATION_DEFINITION_SCHEMA.'+
                                              'TABLE_REPRESENTATION' IN
             TYPEOF (using_representations (mi)) )) > 0))
                    > 0);
END_ENTITY;
(*
```

Clause 5.4.14, p.54

The EXPRESS specification for ***table_record_field_representation*** *was incorrect. The local rules of table_record_field_representation are incorrect since the variable map_item is of type REPRESENTATION,, but it is used as argument to the function using_representations, which accepts only variables of type FOUNDED_ITEM_SELECT. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
ENTITY table_record_field_representation
  SUBTYPE OF (symbol_representation);
WHERE
  WR1: (SIZEOF(USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                            'REPRESENTATION_RELATIONSHIP.REP_2')) > 0)
                       OR
       (SIZEOF(QUERY( map_item <* USEDIN(SELF, 'REPRESENTATION_SCHEMA.'+
                                               'REPRESENTATION_MAP.'+
                                               'MAPPED_REPRESENTATION') |
         SIZEOF(QUERY( mi <* USEDIN(map_item, 'REPRESENTATION_SCHEMA.'+
                                              'MAPPED_ITEM.'+
```

```
                                                    'MAPPING_SOURCE') |
                                                'PRESENTATION_DEFINITION_SCHEMA.'+
                                                  'TABLE_RECORD_REPRESENTATION' IN
                TYPEOF (using_representations (mi)) )) > 0))
                       > 0);
END_ENTITY;
(*
```

Clause 5.6.2, p. 72

The EXPRESS specification for the FUNCTION **acyclic_symbol_representation_relationship** *contained logical errors in the function body. The assignment to variable 'x' requires a 'SET' and not a 'BAG'. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
FUNCTION acyclic_symbol_representation_relationship
  (relation : symbol_representation_relationship;
   children : SET OF symbol_representation ) : BOOLEAN;
  LOCAL
    x : SET OF symbol_representation_relationship;
    local_children : SET OF symbol_representation;
  END_LOCAL;

  REPEAT i:=1 TO HIINDEX(children);
    IF relation\representation_relationship.rep_1 :=: children[i] THEN
      RETURN(FALSE);
    END_IF;
  END_REPEAT;

  x := bag_to_set (USEDIN ( relation\representation_relationship.rep_1,
                'REPRESENTATION_SCHEMA.'+
                'REPRESENTATION_RELATIONSHIP.'+ 'REP_2'));
  local_children := children + relation\representation_relationship.rep_1;

  IF SIZEOF (x) > 0 THEN
    REPEAT i:=1 TO HIINDEX (x);
      IF NOT acyclic_symbol_representation_relationship(x[i] ,
                                                  local_children) THEN
        RETURN (FALSE);
      END_IF;
    END_REPEAT;
  END_IF;

  RETURN (TRUE);

END_FUNCTION;
(*
```

Clause 5.6.3, p. 73

The EXPRESS specification for the FUNCTION **field_in_table** *contained spelling and logical errors. The expression in the first QUERY requires a string 'PRESENTATION_DEFINITION_SCHEMA. TABLE_RECORD_REPRESENTATION' and not a string 'PRESENTATION_DEFINITIONS_ SCHEMA.TABLE_RECORD_REPRESENTATION'. The declaration of variable 'symbol_rep_rel_set' requires a 'SET" and not a 'SET[1:?]'. The declaration of variable mapped_item_set' requires a 'SET" and not a 'SET[1:?]'. The declaration of variable 'table_record_rep_set' requires a 'SET" and not a 'SET[1:?]'.The assignment to variable 'symbol_rep_rel_set' requires a 'SET" and not a 'BAG'. The built-in function USEDIN in the second QUERY requires a role name qualified by an attribute name as argument 2. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
FUNCTION field_in_table (field : table_record_field_representation;
                         table : annotation_table_occurrence): BOOLEAN;
  LOCAL
    table_rep : table_representation;
    symbol_rep_rel_set : SET OF symbol_representation_relationship;
    mapped_item_set : SET OF mapped_item;
    table_record_rep_set : SET OF table_record_representation := [];
  END_LOCAL;

  table_rep := table\styled_item.item\mapped_item.mapping_source.
    mapped_representation;
  mapped_item_set := QUERY(item <* table_rep.items |
                       ('REPRESENTATION_SCHEMA.MAPPED_ITEM' IN
                        TYPEOF(item))
                                 AND
                       ('PRESENTATION_DEFINITION_SCHEMA.'+
                        'TABLE_RECORD_REPRESENTATION' IN
                         TYPEOF(item\mapped_item.mapping_source.
                                    mapped_representation ))
                     );
REPEAT i := 1 TO HIINDEX(mapped_item_set);
    table_record_rep_set := table_record_rep_set +
           mapped_item_set[i].mapping_source.mapped_representation;
  END_REPEAT;

  symbol_rep_rel_set := bag_to_set (USEDIN(table_rep,
                                'REPRESENTATION_SCHEMA.'+
                                'REPRESENTATION_RELATIONSHIP.REP_1'));

  REPEAT i := 1 TO HIINDEX(symbol_rep_rel_set);
     table_record_rep_set := table_record_rep_set +
              symbol_rep_rel_set[i]\representation_relationship.rep_2;
  END_REPEAT;
```

```
  IF SIZEOF(QUERY( table_record_rep <* table_record_rep_set |
        (SIZEOF(QUERY( rep_rel <* USEDIN(table_record_rep,
                              'REPRESENTATION_SCHEMA.'+
                              'REPRESENTATION_RELATIONSHIP.REP_1') |
                         ('PRESENTATION_DEFINITION_SCHEMA.' +
                         'SYMBOL_REPRESENTATION_RELATIONSHIP' IN
                         TYPEOF(rep_rel))
                         AND
                         (rep_rel.rep_2 :=: field)
                         )) > 0)
                         OR
                (SIZEOF(QUERY(item <* table_record_rep.items |
                          ('REPRESENTATION_SCHEMA.MAPPED_ITEM' IN
                           TYPEOF(item))
                                  AND
                          (field :=: item\mapped_item.mapping_source.
                                     mapped_representation )
                           )) > 0)
              )) = 0 THEN
    RETURN(FALSE);
  END_IF;

  RETURN(TRUE);

END_FUNCTION;
(*
```

Clause 6, p. 74

The EXPRESS specification for the **presentation_appearance_schema** *did not include a reference to required data type. The first required data type is an entity data type, the group for the amended SELECT type* **style_context_select**. *The second required reference is a function, the* **bag_to_set** *for the EXPRESS specifications changed in* **acyclic_occlusion_precedence**. *Add the following EXPRESS specification before the 'REFERENCE FROM MEASURE_SCHEMA':*

```
REFERENCE FROM group_schema
    (group);
```

Delete the following EXPRESS specification:

```
REFERENCE FROM support_resource_schema
    (label);
```

Replace with the following EXPRESS specification:

```
REFERENCE FROM support_resource_schema
    (label,
     bag_to_set);
```

Clause 6.3.1, p. 80

The possibility to control the presentation style by a layer is a fundamental concept of ISO 10303-46. However the EXPRESS specification for the type **style_context_select** *did not include the necessary entities. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
TYPE style_context_select = SELECT
  (group,
   presentation_layer_assignment,
   representation,
   representation_item,
   presentation_set);
END_TYPE;
(*
```

Clause 6.3.43, p. 96

The restriction of invisibility to **presentation_representation** *does not satisfy the requirement to define a complete model as invisible. Include the entity representation instead of* **presentation_representation** *in the SELECT type* **invisible_item**. *Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
TYPE invisible_item = SELECT
  (styled_item,
   presentation_layer_assignment,
   representation);
END_TYPE;
(*
```

Clause 6.6.12, p.106

The EXPRESS specification for ***draughting_pre_defined_curve_font*** *defined below are required for reference from other parts of ISO 10303. Add the following as clause 6.6.12 after clause 6.6.11.*

6.6.12 draughting_pre_defined_curve_font

A **draughting_pre_defined_curve_font** is a **pre_defined_curve_font** that is identified by name.

EXPRESS specification:

```
*)
ENTITY draughting_pre_defined_curve_font
  SUBTYPE OF (pre_defined_curve_font);
WHERE
  WR1: SELF.name IN
```

```
        ['continuous',
         'chain',
         'chain double dash',
         'dashed',
         'dotted'];
END_ENTITY;
(*
```

Formal propositions:

WR1: The name of the **draughting_pre_defined_curve_font** shall be 'continuous', 'chain', 'chain double dash', 'dashed', or 'dotted'.

Attribute value definitions:

Table 2 states the lengths of each line segment and space, in millimetres, corresponding to each of the predefined curve fonts that are specified in this part of ISO 10303. If the **pre_defined_curve_font** is used as part of the definition of a **curve_style_font_and_scaling**, then the given lengths are those when the **curve_font_scaling** attribute has the value 1.0.

NOTE 1 - The **curve_style_font_and_scaling** entity is defined in the **presentation_appearance_schema** in ISO 10303-46.

NOTE 2 - Illustrations of curve fonts are given in Figure 1.

Table 2 – Line segment and space lengths for predefined curve fonts

Curve pattern name	Segment (mm)	Space (mm)	Segment (mm)	Space (mm)	Segment (mm)	Space (mm)	Number of segments
continuous							0
dashed	4.0	1.5					2
Chain	7.0	1.0	1.0	1.0			4
Chain double dash	7.0	1.0	1.0	1.0	1.0	1.0	6
dotted	1.0	1.0					2

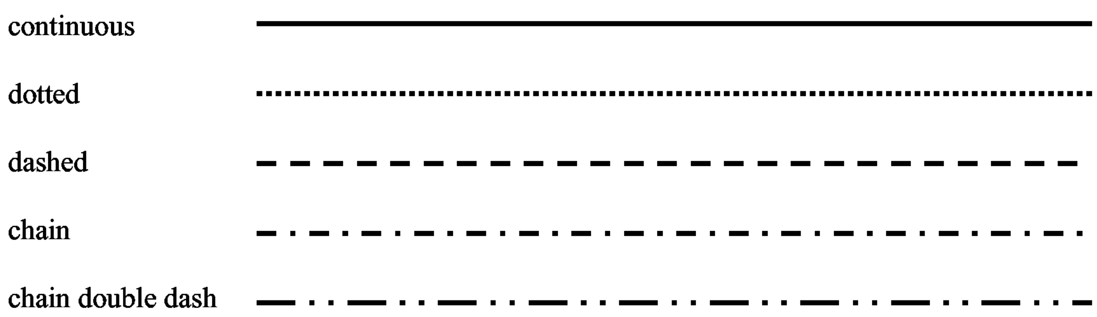

Figure 1 – Illustration of predefined curve fonts

Clause 6.9.10, p.124
*The EXPRESS specification for **text_style_with_mirror** does not specify in the definition or in the EXPRESS specification that the axis_2_placement has to be founded in the appropriate context. Add the following paragraph after Attribute definitions: and before clause 6.9.11.*

Informal propositions:

IP1: Text_style_with_mirror.mirror_placement shall have the axis2_placement founded in the same context as the text that is being mirrored.

Clause 6.13.1, p. 130

The EXPRESS specification for the FUNCTION **acyclic_occlusion_precedence** *contained logical errors in the function body. The assignment to variable 'x' requires a 'SET' and not a 'BAG'. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
FUNCTION acyclic_occlusion_precedence
   ( relation : occlusion_precedence;
     set_of_lower : SET OF hiding_or_blanking_select ) : BOOLEAN;
   LOCAL
      x : SET OF occlusion_precedence;
      local_set_of_lower : SET OF hiding_or_blanking_select;
   END_LOCAL;
   REPEAT i:=1 TO HIINDEX(set_of_lower);
      IF relation.higher_precedence :=: set_of_lower[i] THEN
         RETURN(FALSE);
      END_IF;
   END_REPEAT;
   x := bag_to_set (USEDIN ( relation.higher_precedence,
                  'PRESENTATION_APPEARANCE_SCHEMA.'+
           'OCCLUSION_PRECEDENCE.LOWER_PRECEDENCE'));
   local_set_of_lower := set_of_lower + relation.higher_precedence;
   IF SIZEOF (x) > 0 THEN
      REPEAT i:=1 TO HIINDEX (x);
         If NOT acyclic_occlusion_precedence(x[i] ,
                                             local_set_of_lower) THEN
            RETURN (FALSE);
         END_IF;
      END_REPEAT;
   END_IF;
   RETURN (TRUE);
END_FUNCTION;
(*
```

Clause 7.3.13, p.139

The EXPRESS specification of **colour_associated** *contained logical errors in the attribute declaration. Attribute 'name' requires a type 'label' and not 'colour'. Remove the EXPRESS specification and replace with the following:*

EXPRESS specification:

```
*)
ENTITY colour_associated
  SUBTYPE OF (colour);
  name :                  label;
  variable_to_be_shown : SET [1:?] OF REAL;
  mapping              : colour_association_table;
END_ENTITY;
(*
```

Clause 7.3.20, p.142

The EXPRESS specification for ***draughting_pre_defined_colour*** *defined below are required for reference from other parts of ISO 10303. Add the following as clause 7.3.20 after clause 7.3.19 and before the END_SCHEMA EXPRESS declaration.*

7.3.20 draughting_pre_defined_colour

A **draughting_pre_defined_colour** is a **pre_defined_colour** that is identified by name.

EXPRESS specification:

```
*)
ENTITY draughting_pre_defined_colour
  SUBTYPE OF (pre_defined_colour);
WHERE
  WR1: SELF.name IN
       ['red',
        'green',
        'blue',
        'yellow',
        'magenta',
        'cyan',
        'black',
        'white'];
END_ENTITY;
(*
```

Formal propositions:

WR1: The name of the **draughting_pre_defined_colour** shall be 'red', 'green', 'blue', 'yellow', 'magenta', 'cyan', 'black', or 'white'.

Attribute value definitions:

Table 1 states the RGB values corresponding to each of the predefined colours that are specified by this part of ISO 10303.

Table 1 – RGB colours for predefined colours

Colour name	Red	Green	Blue
black	0.0	0.0	0.0
red	1.0	0.0	0.0
green	0.0	1.0	0.0
blue	0.0	0.0	1.0
yellow	1.0	1.0	0.0
magenta	1.0	0.0	1.0
cyan	0.0	1.0	1.0
white	1.0	1.0	1.0

Clause 7.3.21, p.142
*The EXPRESS specification for **draughting_pre_text_font** defined below is required for reference from other parts of ISO 10303. Add the following as clause 7.3.21 after clause 7.3.20 and before the END_SCHEMA EXPRESS declaration.*

7.3.21 draughting_pre_defined_text_font

A **draughting_pre_defined_text_font** is a **pre_defined_text_font** that is identified by name. The definition of the appearance of each **draughting_pre_defined_text_font** is given in ISO 3098.

EXPRESS specification:

```
*)
ENTITY draughting_pre_defined_text_font
   SUBTYPE of (pre_defined_text_font);
WHERE
   WR1: SELF.name[1:8] = 'ISO 3098';
END_ENTITY;
(*
```

Formal propositions:

WR1: The **name** of the **draughting_pre_defined_text_font** shall be defined by 'ISO 3098'.

Attribute value definitions:

The **draughting_pre_defined_text_font**s are defined by ISO 3098-0.

NOTE Prior usage of ISO 10303-46 utilized the following:
- **ISO 3098-1 font A**: the text font denoted as Lettering A in clause 3 of ISO 3098-1.
- **ISO 3098-1 font B**: the text font denoted as Lettering B in clause 3 of ISO 3098-1.

Annex A, p. 143

With the changes identified in this Technical Corrigendum, the list of short names of entities is incomplete. Add the following rows in the existing tale in the correct alphabetical order:

Entity names	Short names
CAMERA_IMAGE_3D_WITH_SCALE	CI3WS
DRAUGHTING_PRE_DEFINED_COLOUR	DPDC
DRAUGHTING_PRE_DEFINED_CURVE_FONT	DPDCF
DRAUGHTING_PRE_DEFINED_TEXT_FONT	DPDTF

Annex B.1, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for this part of ISO 10303 has changed. Remove the object identifier for the document and replace with the following:

{ iso standard 10303 part(46) version (3) }

Annex B.2.1, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_organisation_schema has changed. Remove the object identifier for the presentation_organisation_schema and replace with the following:

{ iso standard 10303 part(46) version (3) schema(1) presentation-organisation-schema(1) }

Annex B.2.2, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_definition_schema has changed. Remove the object identifier for the presentation_definition_schema and replace with the following:

{ iso standard 10303 part(46) version (3) schema(1) presentation-definition-schema(2) }

Annex B.2.3, p. 150

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_appearance_schema has changed. Remove the object identifier for the presentation_appearance_schema and replace with the following:

{ iso standard 10303 part(46) version (3) schema(1) presentation-appearance-schema(3) }

Annex B.2.4, p. 151

With the changes identified in this Technical Corrigendum, the object identifier for the presentation_resource_schema has changed. Remove the object identifier for the presentation_resource_schema and replace with the following:

{ iso standard 10303 part(46) version (3) schema(1) presentation-resource-schema(4) }

Annex C, p. 152
With the changes identified in this Technical Corrigendum, the EXPRESS contained in digital form is incorrect. Replace the contents of the annex with the following:

This annex provides a listing of the EXPRESS entity names and corresponding short names as specified in this part of ISO 10303. It also provides a listing of the complete EXPRESS schema specified in this part of ISO 10303 without comments or other explanatory text. This annex is available in computer-interpretable form and can be found at the following URLs:

Short names: http://www.mel.nist.gov/div826/subject/apde/snr/
EXPRESS: http://www.mel.nist.gov/step/parts/part046/is/tc2/

If there is difficulty accessing these sites contact ISO Central Secretariat or contact the ISO TC 184/SC4 Secretariat directly at: sc4sec@cme.nist.gov.

NOTE - The information provided in computer-interpretable form at the above URLs is informative. The information that is contained in the body of this part of ISO 10303 is normative.

Annex E, p. 159, 160, 173,177, 197
The EXPRESS-G diagrams in annex E should be changed to take account of the additions identified above. Modify EXPRESS-G diagram figure E.3 to include the additional subtype of ***camera_image_3d_with_scale*** *to the entity* ***camera_image.*** *The EXPRESS-G diagram figure E.4 should be changed to take account of the revised definition of* **view_volume**. *Modify figure E.4 to show* **view_volume** *as a subtype of* **founded_item** *imported from representation schema. The EXPRESS-G diagram figure E.17 should be changed to take account of the revised definition of* **style_context_select**. *Modify figure E.17 to include group and* **presentation_layer_assignment** *in the SELECT. Modify EXPRESS-G diagram figure E.21 to include the additional subtype of* ***draughting_pre_defined_curve_font*** *to* ***pre_defined_curve_font***. *The EXPRESS-G diagram figure E.37 should be changed to take account of the revised definition of* **invisible_item**. *Modify figure E.37 to include representation instead of* **presentation_representation** *in the SELECT. Modify EXPRESS-G figure E.40 to include the subtype of* ***draughting_pre_defined_text_font*** *to* ***pre_defined_text_font***. *Modify EXPRESS-G figure E.41 to include the additional subtype of* ***draughting_pre_defined_colour*** *to* ***pre_defined_colour***.