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

Part 520:

**Application interpreted construct:
Associative draughting elements**

*Systèmes d'automatisation industrielle et intégration — Représentation
et échange de données de produits —*

*Partie 520: Construction interprétée d'application: Éléments de dessin
associatif*

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75% of the member bodies casting a vote.

International Standard ISO 10303-520 was prepared by Technical Committee ISO/TC 184, *Industrial automation systems and integration*, Subcommittee SC4, *Industrial data*.

This International Standard is organized as a series of parts, each published separately. The parts of ISO 10303 fall into one of the following series: description methods, integrated resources, application protocols, abstract test suites, implementation methods, and conformance testing. The series are described in ISO 10303-1.

A complete list of parts of ISO 10303 is available from the internet:

<http://www.nist.gov/sc4/editing/step/titles/>

[ISO 10303-520:1999](http://www.nist.gov/sc4/editing/step/titles/)

Annexes A and B form an integral part of this part of ISO 10303. Annexes C and D are for information only.

Introduction

ISO 10303 is an International Standard for the computer-interpretable representation and exchange of product data. The objective is to provide a neutral mechanism capable of describing product data throughout the life cycle of a product independent from any particular system. The nature of this description makes it suitable not only for neutral file exchange, but also as a basis for implementing and sharing product databases and archiving.

This International Standard is organized as a series of parts, each published separately. The parts of ISO 10303 fall into one of the following series: description methods, integrated resources, application interpreted constructs, application protocols, abstract test suites, implementation methods, and conformance testing. The series are described in ISO 10303-1. This part of ISO 10303 is a member of the application interpreted constructs series.

An application interpreted construct (AIC) provides a logical grouping of interpreted constructs that supports a specific functionality for the usage of product data across multiple application contexts. An interpreted construct is a common interpretation of the integrated resources that supports shared information requirements among application protocols.

This document specifies the application interpreted construct for the description of structures to associate the annotation used in draughting with the geometric aspects of the shape where the annotation applies.

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Industrial automation systems and integration —

Product data representation and exchange Part 520: Application interpretation Associative draughting

1 Scope

This part of ISO 10303 specifies the requirements for the representation of associative product shape of a product.

The following are within the scope of this part of ISO 10303:

- the structures for representing associative product shape and their respective target product shape
- the structures for representing associative product shape geometry or annotations

The following are outside the scope of this part of ISO 10303:

- the representation of the product shape
- the styling of dimensions, annotations

2 Normative references

The following normative documents constitute provisions of this part of ISO 10303. To the extent that they are applicable, to, or revisions of, any of these publications based on this part of ISO 10303 are the most recent editions of the normative documents. The latest edition of the normative documents registers of currently valid International Standards are:

ISO 8824–1:1995, *Information Technology – Data Interchange – Notation One (ASN.1) – Part 1: Specification*

ISO 10303–11:1994, *Industrial automation systems and integration – Part 11: Description and exchange – Part 11: Descriptive data*

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*egration – Product data representa-
fundamentals of product description*

*egration – Product data representa-
Representation structures.*

*egration – Product data representa-
Visual presentation.*

*egration – Product data representa-
Shape variation tolerances.*

*egration – Product data representa-
ces: Draughting.*

*egration – Product data representa-
ative draughting.*

S

as defined in ISO 10303-1 apply:

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3.2 Terms defined in ISO 10303–202

For the purpose of this part of ISO 10303, the following terms defined in ISO 10303–202 apply:

3.2.1

application interpreted construct

a logical grouping of interpreted constructs that supports a specific function for the usage of product data across multiple application contexts

[ISO 10303–202:1996, definition 3.7.1]

3.3 Abbreviations

For the purpose of this part of ISO 10303, the following abbreviations apply:

AIC	application interpreted construct
AP	application protocol
ATS	abstract test suite

4 EXPRESS short listing

This clause specifies the EXPRESS schema that uses elements from the integrated resources and contains the types, entity specializations, and functions that are specific to this part of ISO 10303.

NOTE 1 - There may be subtypes and items of select lists that appear in the integrated resources that are not imported into the AIC. Constructs are eliminated from the subtype tree or select list through the use of the implicit interface rules of ISO 10303-11. References to eliminated constructs are outside the scope of the AIC. In some cases, all items of the select list are eliminated. Because AICs are intended to be implemented in the context of an application protocol, the items of the select list will be defined by the scope of the application protocol.

EXPRESS specification:

*)

```
SCHEMA aic_associative_draughting_elements;
```

```
USE FROM measure_schema                -- ISO 10303-41
  (derived_unit,
   named_unit);
```

```
USE FROM product_property_definition_schema -- ISO 10303-41
```

ISO 10303-41

ISO 10303-41

ISO 10303-43

ISO 10303-43

ISO 10303-45

ISO 10303-46

ISO 10303-46

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- ISO 10303-46

ISO 10303-47

ISO 10303-101

the following parts of ISO 10303:

_element_schema	ISO 10303-101
measure_schema	ISO 10303-41
presentation_appearance_schema	ISO 10303-46

presentation_definition_schema	ISO10303-46
presentation_organization_schema	ISO 10303-46
product_property_definition_schema	ISO 10303-41
product_property_representation_schema	ISO 10303-41
representation_schema	ISO 10303-43
shape_dimension_schema	ISO 10303-47
support_resource_schema	ISO 10303-41

4.1 Fundamental concepts and assumptions

The following entities are intended to be independently instantiated in the application protocol schemas that use this AIC:

- annotation_curve_occurrence;
- annotation_fill_area_occurrence;
- annotation_occurrence_associativity;
- annotation_symbol_occurrence;
- dimension_text_associativity;
- draughting_callout;
- draughting_model;
- leader_curve;
- projection_curve;
- shape_aspect_associativity;
- shape_definition_representation;
- shape_dimension_representation.

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4.2 aic_associative_draughting_elements entity definitions

4.2.1 annotation_occurrence_associativity

An **annotation_occurrence_associativity** is an **annotation_occurrence_relationship** that relates an element of annotation to the leader or projection curve which visually directs information in the drawing to the element or to the fill area whose boundary is derived from the element.

_____:

```

*)
ENTITY annotation_occurrence_associativity
  SUBTYPE OF (annotation_occurrence_relationship);
WHERE
  WR1:  SIZEOF (TYPEOF (SELF.related_annotation_occurrence) *
             ['AIC_ASSOCIATIVE_DRAUGHTING_ELEMENTS.ANNOTATION_FILL_AREA_OCCURRENCE',
             'AIC_ASSOCIATIVE_DRAUGHTING_ELEMENTS.PROJECTION_CURVE',
             'AIC_ASSOCIATIVE_DRAUGHTING_ELEMENTS.LEADER_CURVE']) = 1;
END_ENTITY;
(*

```

Formal propositions:

WR1: The `related_annotation_occurrence` shall be a `leader_curve`, `projection_curve`, or `annotation_fill_area_occurrence`.

4.2.2 dimension_text_associativity

A `dimension_text_associativity` is a `text_literal` that maps a `shape_dimension_representation` onto the `draughting_callout` which presents the measurement.

NOTE - The measurement of the `shape_dimension_representation` need not be identical to the character string presented by the `text_literal`.

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EXPRESS specification:

```

*)
ENTITY dimension_text_associativity
  SUBTYPE OF (text_literal, mapped_item);
WHERE
  WR1:  ('AIC_ASSOCIATIVE_DRAUGHTING_ELEMENTS.SHAPE_DIMENSION_REPRESENTATION'
        IN TYPEOF (SELF\mapped_item.
                  mapping_source.mapped_representation));
  WR2:  ('AIC_ASSOCIATIVE_DRAUGHTING_ELEMENTS.DRAUGHTING_CALLOUT'
        IN TYPEOF (SELF\mapped_item.mapping_target));
  WR3:  SIZEOF (QUERY (ato <* QUERY (si <*
        USEDIN (SELF, 'AIC_ASSOCIATIVE_DRAUGHTING_ELEMENTS.STYLED_ITEM.ITEM') |
        ('AIC_ASSOCIATIVE_DRAUGHTING_ELEMENTS.ANNOTATION_TEXT_OCCURRENCE'
        IN TYPEOF(si))) |
        NOT (SIZEOF( QUERY (dc <*
        USEDIN (ato, 'AIC_ASSOCIATIVE_DRAUGHTING_ELEMENTS.' +
        'DRAUGHTING_CALLOUT.CONTENTS') |
        ('AIC_ASSOCIATIVE_DRAUGHTING_ELEMENTS.DRAUGHTING_CALLOUT'
        IN TYPEOF

```