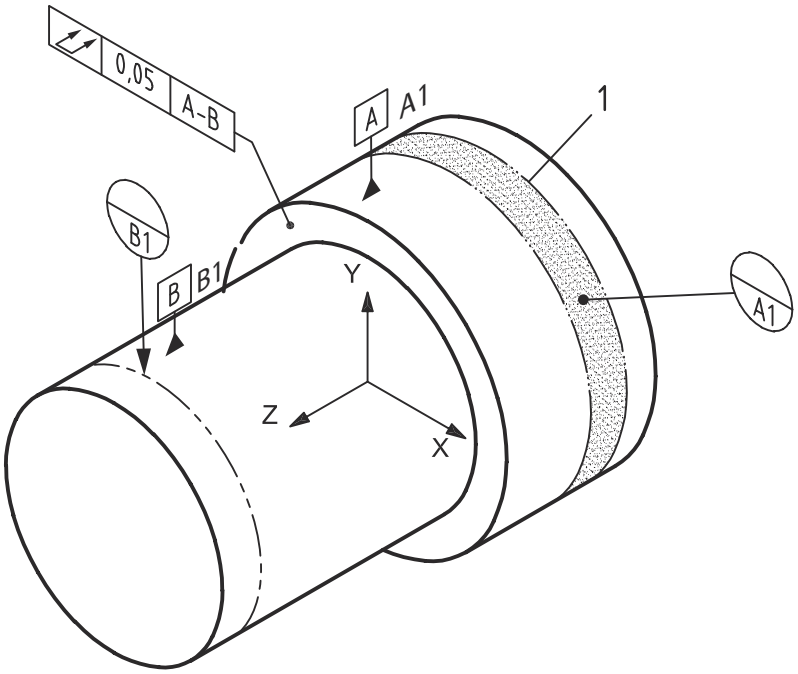


Key

1 cylindrical target datum

Figure 32 — Two cylindrical features establish a datum axis

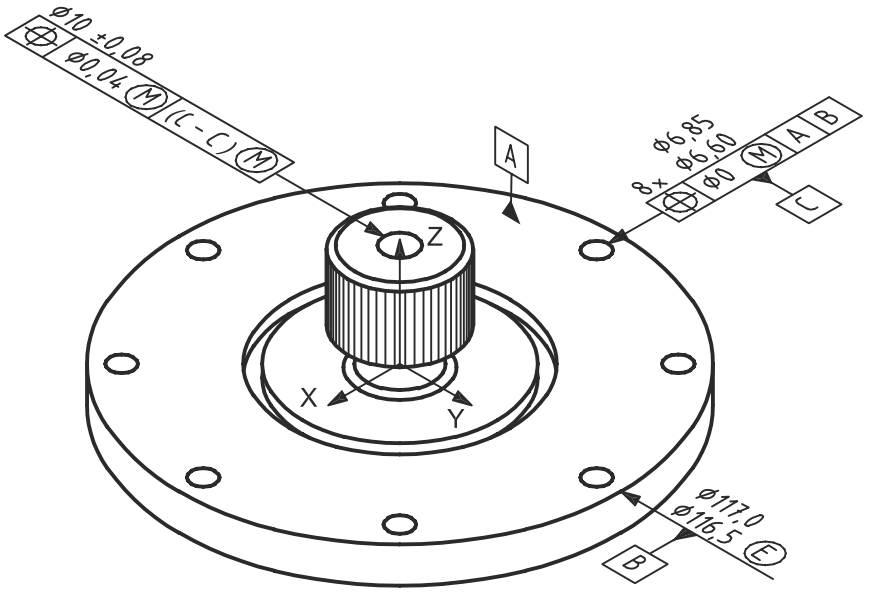
10.3.5 Multiple features establishing a datum

When two or more features are combined to establish a datum, associativity shall be established in the design presentation. For several common instances, the following display and associativity requirements apply.

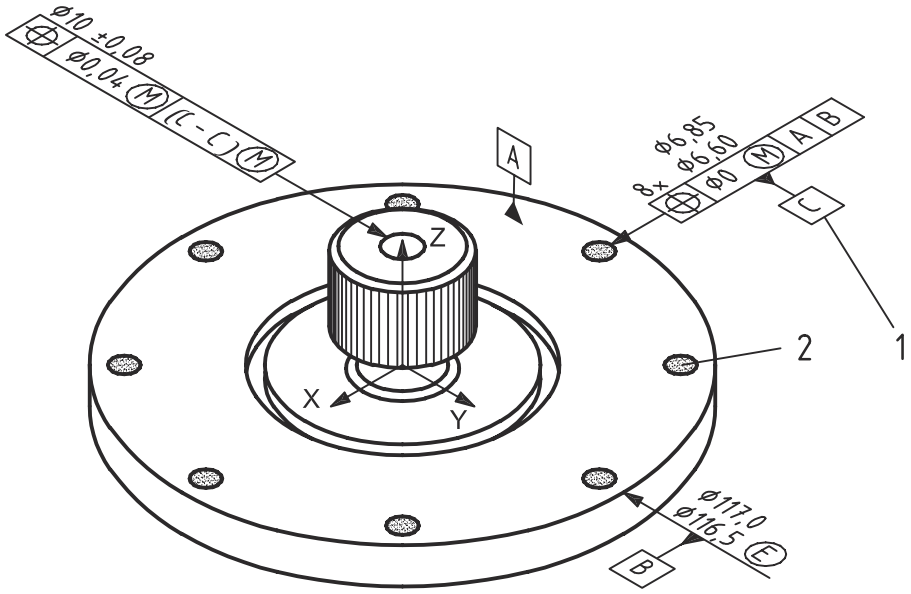
a) When a pattern of features of size is used to establish a datum axis, the involved model features and any applied tolerance for these model features shall be organized as an associated group (see Figure 33).

b) When two or more coaxial and cylindrical datum features are used to establish a single, common datum axis, the involved model features and any applied tolerance for these model features shall be organized as an associated group (see Figure 34).

c) When two or more co-planar surface features are used to establish a datum plane, the involved model surfaces and any applied tolerance for these surfaces shall be organized as an associated group (see Figures 35 and 36).



a) Placement and attachment



b) Datum feature indicator associativity

Key

1 query
2 visual response

Figure 33 — Pattern of features establish a datum axis

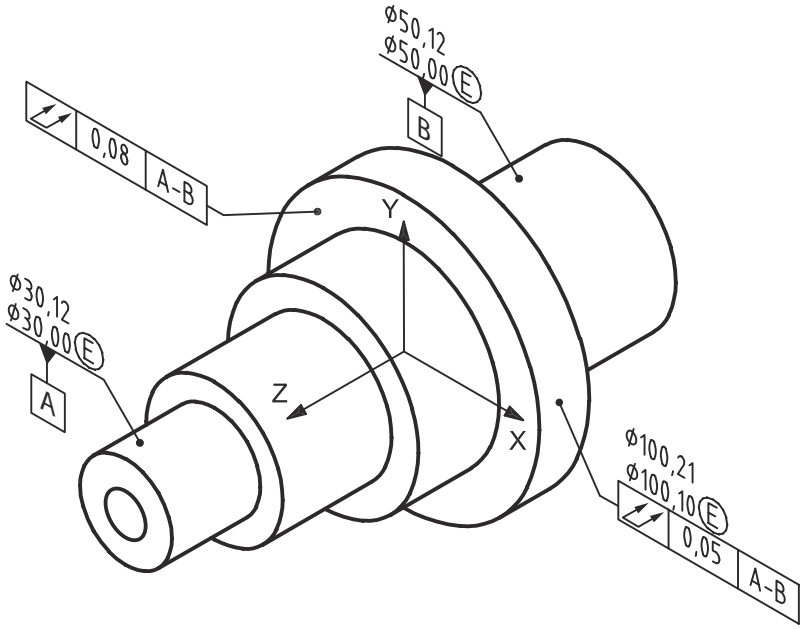
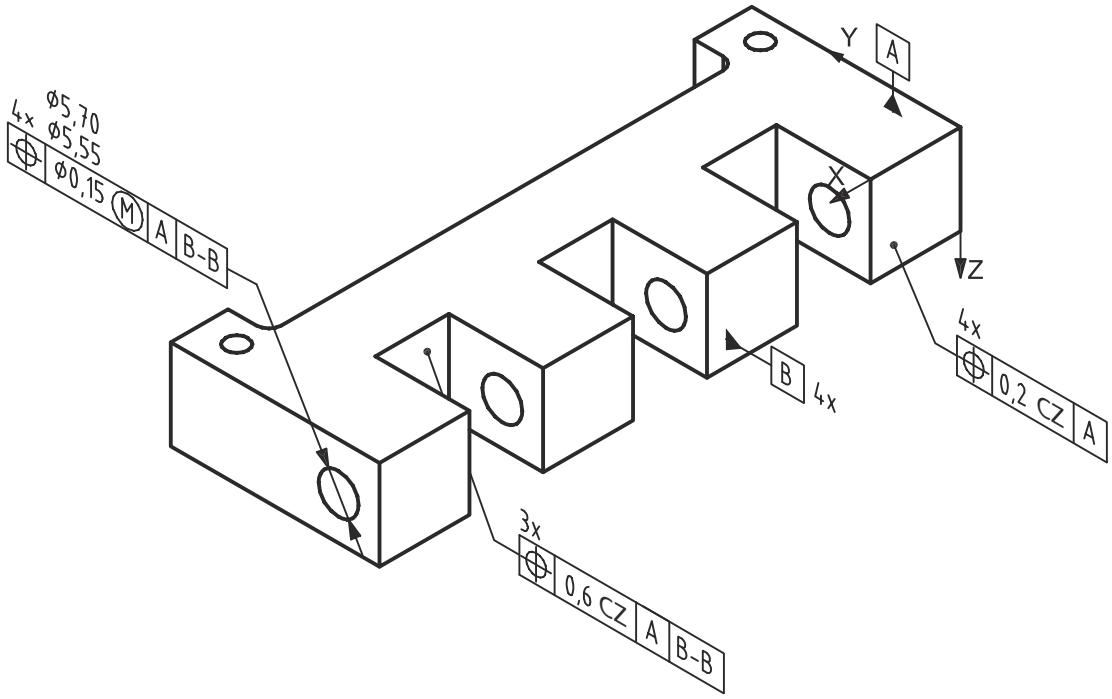
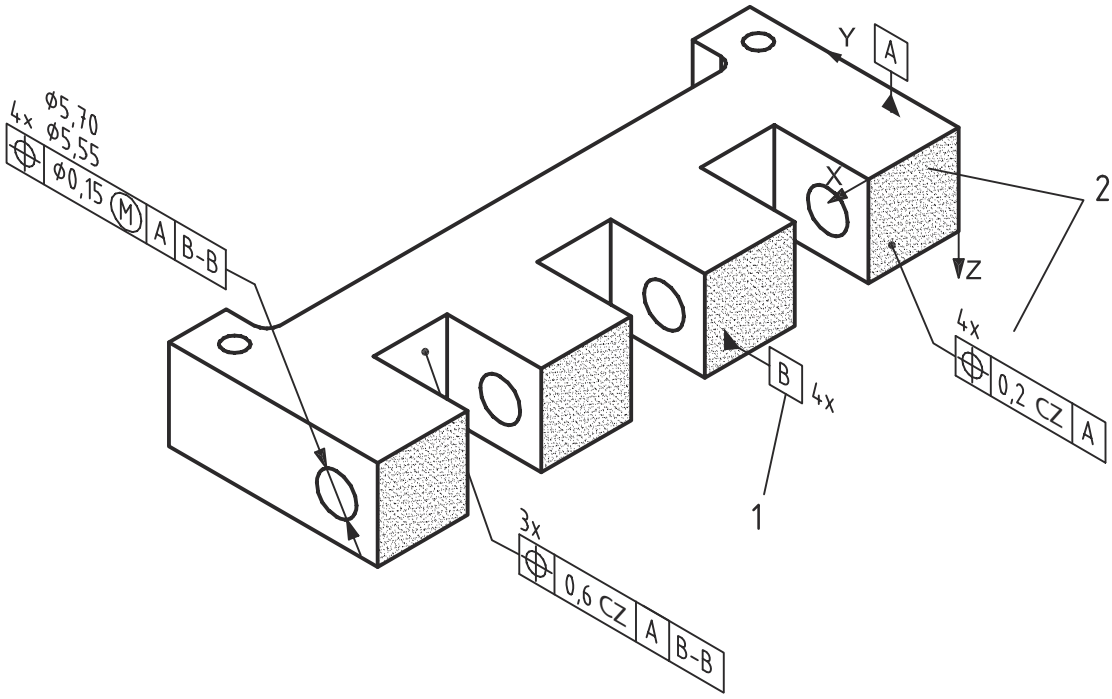


Figure 34 — Two coaxial features establish a datum axis



a) Placement and attachment



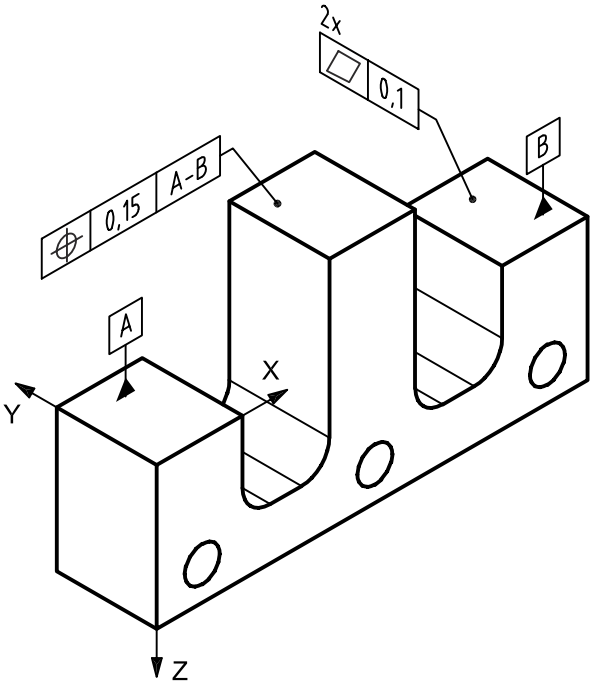
b) Datum feature indicator associativity

Key

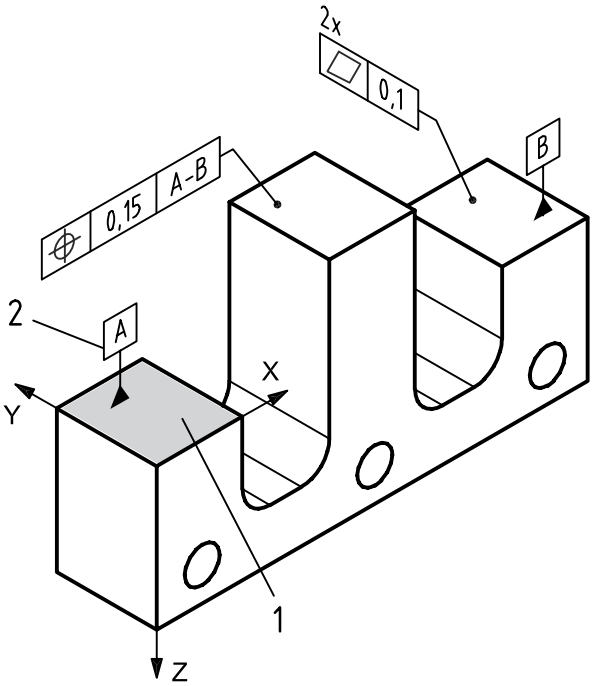
1 query

2 visual response

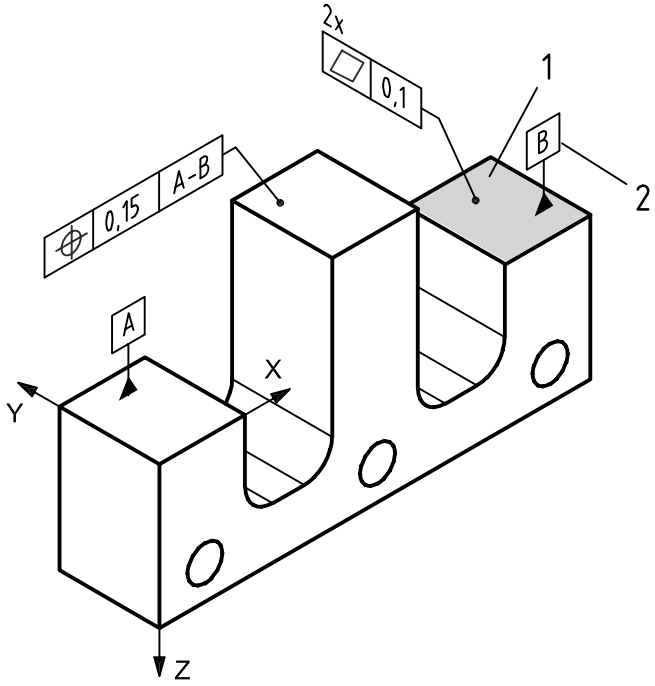
Figure 35 — Co-planar surfaces establish a datum plane



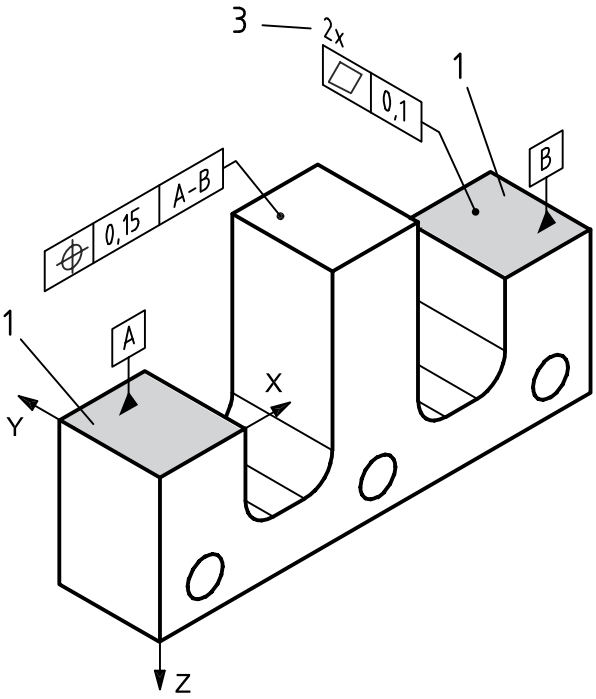
a) Placement and attachment



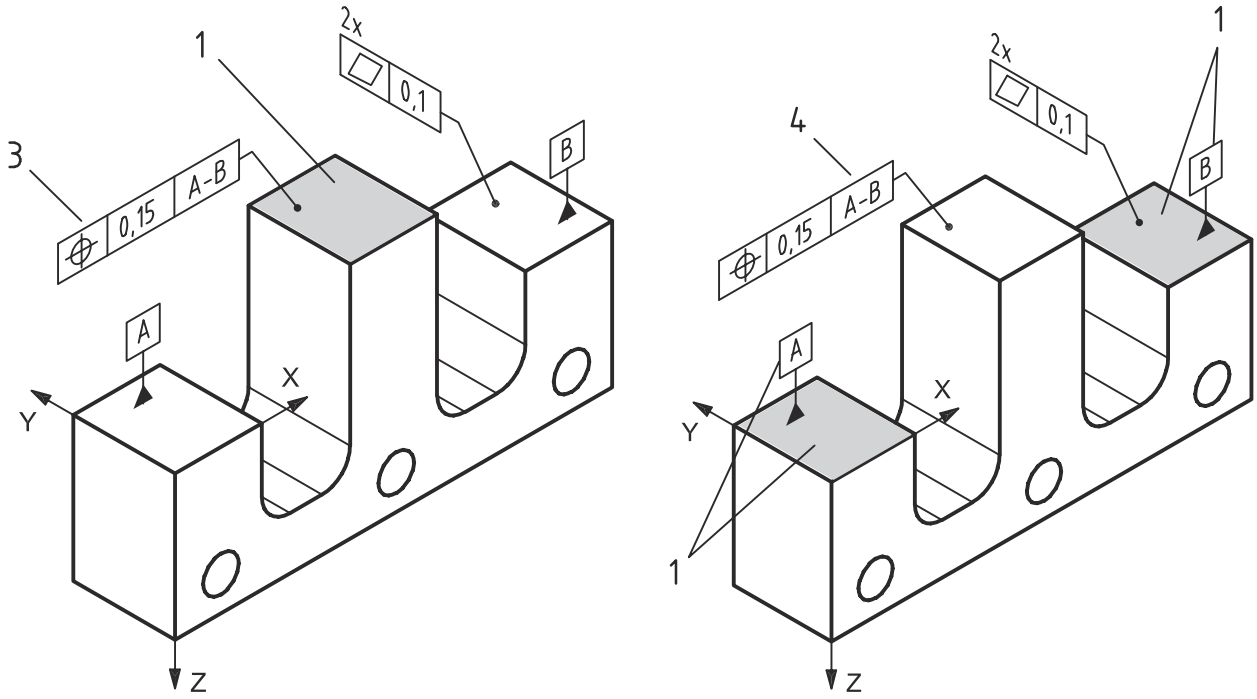
b) Datum feature indicator associativity



c) Datum feature indicator associativity



d) Tolerance frame associativity



e) Tolerance frame associativity **f) Datum reference associativity**

Key

1 visual response
2 datum indicator query
3 tolerance frame query
4 datum reference query

Figure 36 — Separated surfaces establish a datum plane

10.4 Drawing requirements

The following are requirements and other provisions for datum features in axonometric views.

a) The corresponding model coordinate system shall be displayed in each axonometric view in which a datum system is cited.

b) Identification of datum features in axonometric views

— The datum indicator should be attached to the surface of the represented object. A single extension line of a model feature outline should not be used for attachment of datum indicators in an axonometric view (see Figure 37).

— Datum indicators may be attached to the dimension for features of size when the feature is used to define a datum (see Figure 28).

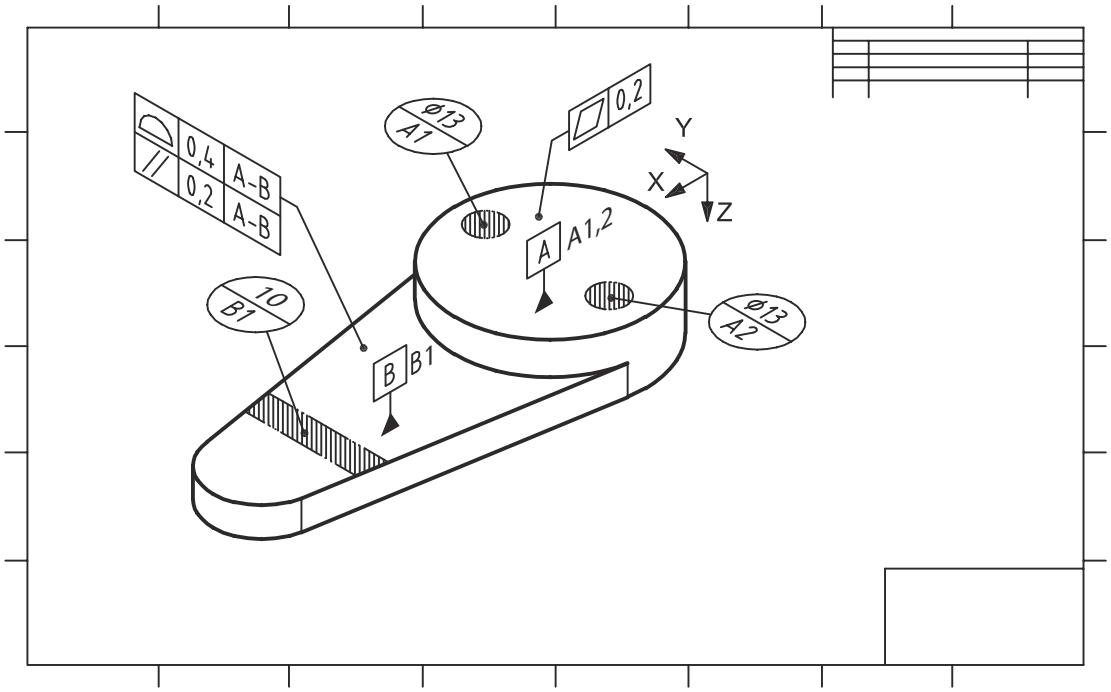


Figure 37 — Datum targets and indicators in an axonometric view

11 Geometric tolerances

11.1 General

This clause establishes the placement, attachment, and display requirements and other provisions for geometric tolerances.

11.2 Common requirements

A general note defining a geometric tolerance may be specified. More than one tolerance can be specified.

11.3 Model requirements

11.3.1 General

The following subclauses address the placement, attachment, and display requirements and other provisions for geometric tolerances associated with model features.

11.3.2 Form tolerances

The tolerance frame shall be placed on an annotation plane parallel to, perpendicular to, or coincident with the surface to which it applies using the attachment methods given in Table 3 (see Figure 38).

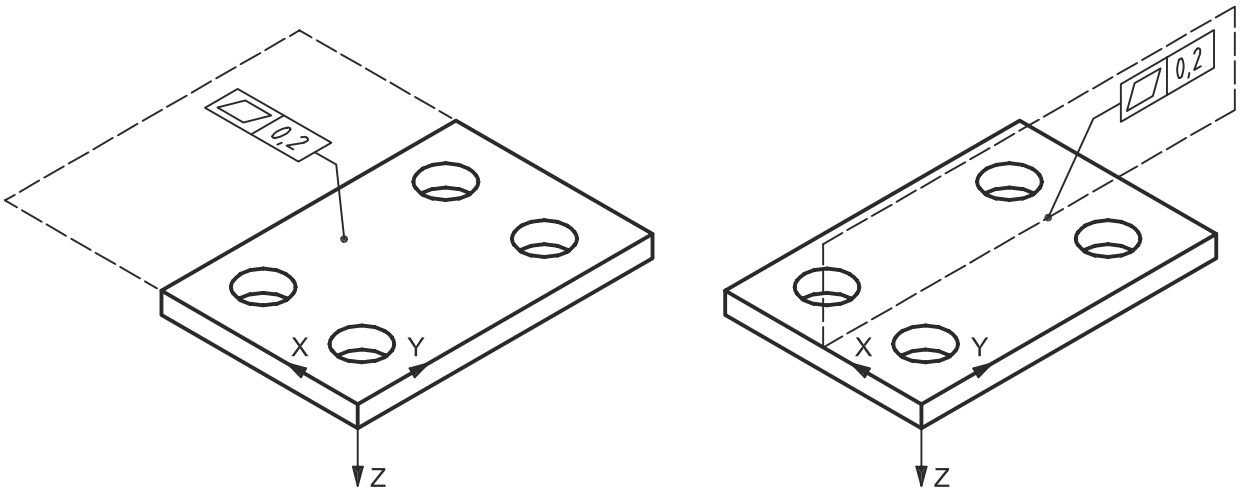
a) Show the tolerance frame which is applicable to a restricted feature using supplemental geometry on the model to indicate the area. Direct a leader line from the tolerance frame to the represented area (see Figure 29).

b) When a roundness tolerance is applied to a sphere, cylinder, cone, or surface of revolution, the tolerance frame shall be placed on an annotation plane perpendicular to the model feature axis or containing the centre point of a sphere (see Figure 39).

c) When a straightness tolerance is applied to the line elements of a cylindrical or conical surface, the tolerance frame shall be placed on an annotation plane containing the axis of the model feature surface (see Figure 44).

Table 3 — Form tolerances

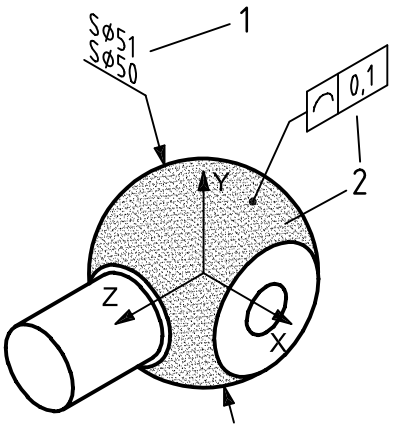
General application		Attachment technique		Figure
		Size	Directed leader line	
	Planar surface		X	38
	Restricted area		X	29
	Sphere		X	39 a)
	Cylinder		X	39 b)
	Conical surface		X	39 c)
	Surface of revolution		X	39 d)
	Cylinder		X	40 a)
	Planar surface		X	41 42 43
	Cylindrical or conical surface		X	44
	Median line	X		45



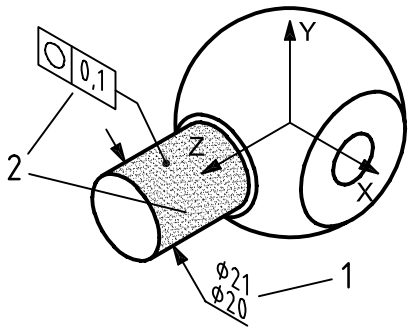
a) Coincident annotation plane **b) Perpendicular annotation plane**

NOTE The annotation planes shown here as dashed lines are for clarification only and are not part of an actual presentation.

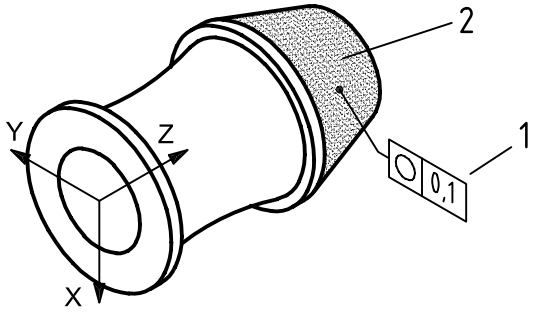
Figure 38 — General application of geometric tolerances' coincident or perpendicular annotation plane



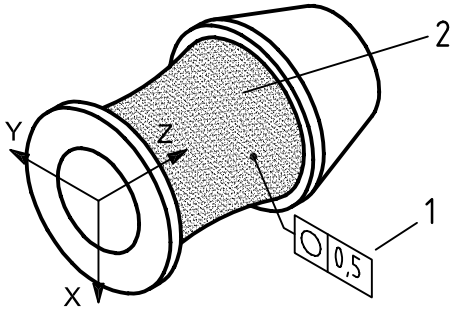
a) Sphere — Leader attachment



b) Cylinder — Leader attachment



c) Conical surface

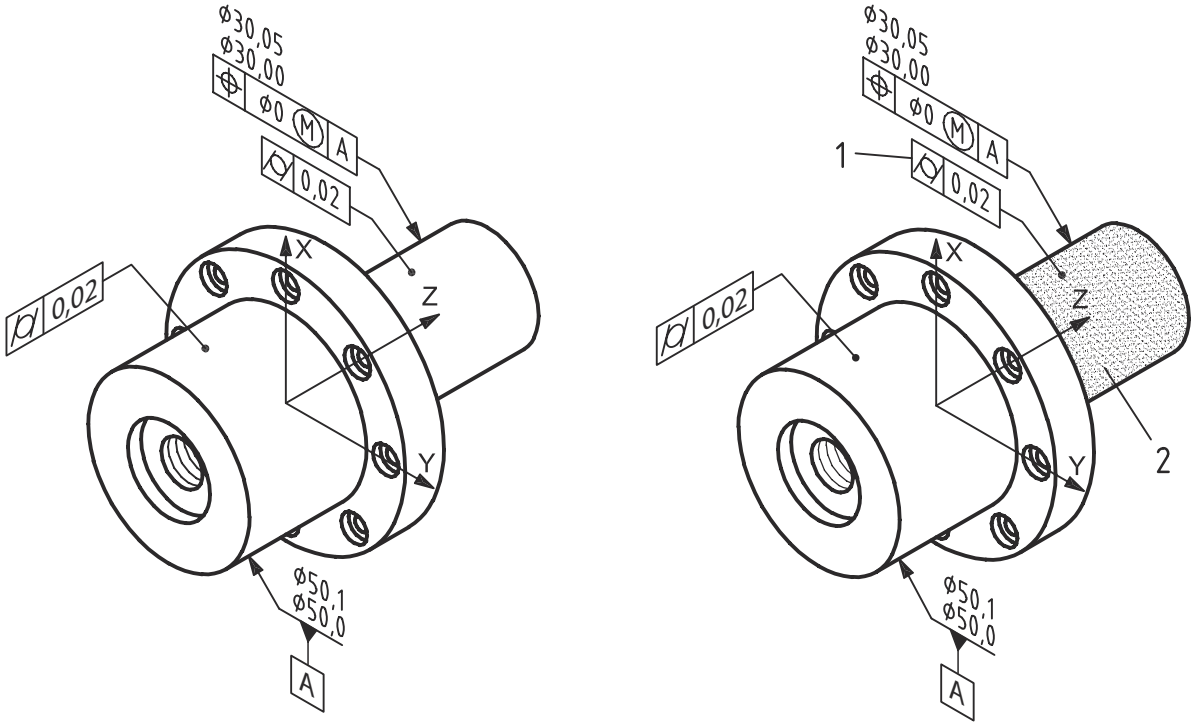


d) Surface of revolution

Key

1 query
2 visual response

Figure 39 — Roundness — Sphere, cylinder, conical, or revolved surface



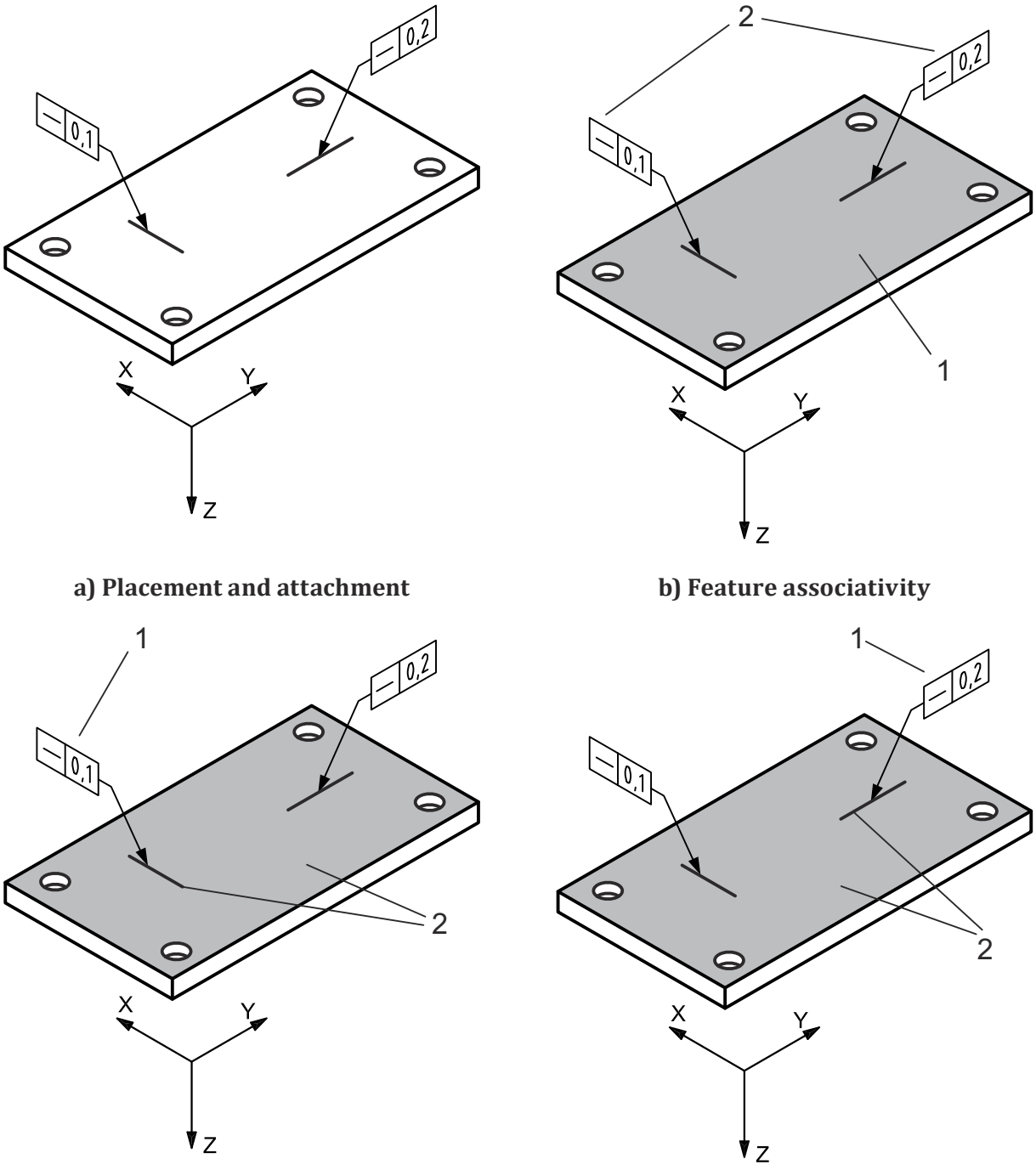
a) Leader attachment **b) Tolerance associativity**

Key

1 query

2 visual response

Figure 40 — Cylindricity



a) Placement and attachment

b) Feature associativity

c) Tolerance direction associativity

d) Tolerance direction associativity

Key

1 query

2 visual response

Figure 41 — Straightness — Directed by line element