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<td>31</td>
</tr>
<tr>
<td>CC_MIN_CROSS</td>
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1 Template attributes in drawing and report templates

You can use template attributes in drawing and report templates. When you open a drawing or create a report, Tekla Structures uses the attributes and formulas to calculate and display information from the model database. This could, for example, include assembly weight or cover area.

The template attributes available in a template row definition depend on the content type of the row. Content types are object types in the product database.

Descriptions of template attributes are listed in alphabetical order, click the letter in the table of contents to show all the attributes beginning with that letter.

1.1 A

**ACN**
Shows control numbers.
For more information on control numbers, see and .

**ACTIVE DESIGN CODE**
Shows the active design code of material.
ADDRESS
Shows the address entered in the Project properties in File menu --> Project properties.

ALIAS_NAME1 ... 3
Alias name of the material.
Use for part and main part material attributes in ASSEMBLY and PART content types.

ANG_S, ANG_T, ANG_U, ANG_V
Show bending angles of reinforcing bars based on the mappings in the rebar_schedule_config.inp file, located in the ..\ProgramData\Tekla Structures\<version>\environments\<environment>\system folder. These mappings are environment-specific by default. You can modify them to suit your company or project needs.

See also
Creating a template for bending schedules or pull-outs
Hard-coded bending type identifiers in reinforcement shape recognition
ANG_U_MAX, ANG_U_MIN, ANG_V_MAX, ANG_V_MIN (page 12)
DIM_A ... DIM_G, DIM_H1, DIM_H2, DIM_I, DIM_J, DIM_K1, DIM_K2, DIM_L, DIM_O, DIM_R, DIM_R_ALL, DIM_TD, DIM_WEIGHT, DIM_X, DIM_Y (page 45)

ANG_U_MAX, ANG_U_MIN, ANG_V_MAX, ANG_V_MIN
Shows the minimum and maximum bending angles of reinforcing bars or meshes in tapered cross sections. See the example below:
The Approved by information of the revision from the Revision Handling dialog box.

**AREA**

Shows the following information:

- For plate type catalog profiles, any parametric profiles and any catalog profiles with **Cover area** property not defined, shows the total net area of all surfaces.

- For other types of catalog profiles with **Cover area** property defined, shows the gross total surface area.

  The area is calculated using the extreme length and profile cover area per meter (value defined in the profile catalog). The cross area on profile ends, cuts and fittings are not taken into account.

**See also**

AREA_GROSS (page 14)
AREA_NET (page 14)

**AREA_FORM_TOP, AREA_FORM_BOTTOM, AREA_FORM_SIDE**

Shows the area of faces whose normal vector points to the following directions:

- **top of form** (AREA_FORM_TOP)
- **bottom of form** (AREA_FORM_BOTTOM)
- **form sides** (AREA_FORM_SIDE)

For assemblies, the main part local up direction dictates the form up/bottom/sides directions. Faces which are inclined less than 5 degrees are counted in the top and bottom areas. Faces which are skew => 85 degrees are counted in the side areas. Faces which are exactly 45 degrees against main global or local axes, are not counted to any direction.
AREA_FORM_TOP = 42 sq.ft.
AREA_FORM_BOTTOM = 42 sq.ft.
AREA_FORM_SIDE = 2*(2*7 + 3*6) + 2*(2*6 + 2*6) = 64 + 48 = 112 sq.ft.

AREA_GROSS
For profiles this field shows the same result as AREA (page 13). For plates it shows the square area (extreme length multiplied by extreme width) needed to include the entire plate. For other objects it shows a zero.

AREA_NET
For parts this field shows the net surface area that forms the actual area of the fabricated part. For other objects it shows a zero.

AREA_PER_TONS
Shows AREA/WEIGHT x 1000.

AREA_PGX, AREA_NGX, AREA_PGY, AREA_NGY, AREA_PGZ, AREA_NGZ
Shows the area of faces whose normal vector points to the positive or negative direction of the following global axes:

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>AREA_PGX</td>
<td>Positive direction of global X-axis</td>
</tr>
<tr>
<td>AREA_NGX</td>
<td>Negative direction of global X-axis</td>
</tr>
<tr>
<td>AREA_PGY</td>
<td>Positive direction of global Y-axis</td>
</tr>
<tr>
<td>Attribute</td>
<td>Direction</td>
</tr>
<tr>
<td>--------------------</td>
<td>---------------------------------------</td>
</tr>
<tr>
<td>AREA_NGY</td>
<td>Negative direction of global Y-axis</td>
</tr>
<tr>
<td>AREA_PGZ</td>
<td>Positive direction of global Z-axis</td>
</tr>
<tr>
<td>AREA_NGZ</td>
<td>Negative direction of global Z-axis</td>
</tr>
</tbody>
</table>

Also faces whose normal vector is located in less than 45 degree angle to global axis are also included in the area. Faces exactly in 45 degree angle are not included in any global direction.

**AREA_PLAN**

For parts this field shows the total upper surface area (perpendicular to the global Z-axis).

**ASSEMBLY content type**

- Shows the total upper surface area (perpendicular to the global Z-axis) of the parts included in an assembly.

**AREA_PROJECTION_GXY_GROSS, AREA_PROJECTION_GXZ_GROSS, AREA_PROJECTION_GYZ_GROSS**

Shows the area of the "shadow" of a part, assembly, or cast unit at the following global planes:

- XY-plane
- XZ-plane
- YZ-plane

**Restrictions**

- Areas are calculated always in net areas (holes are taken into account) even when gross is requested.
- Overlapping faces are counted twice.

**AREA_PROJECTION_GXY_NET, AREA_PROJECTION_GXZ_NET, AREA_PROJECTION_GYZ_NET**

Shows the net area of the "shadow" of a part, assembly, or cast unit at the following global planes:

- XY-plane
- XZ-plane
- YZ-plane

**AREA_PROJECTION_XY_GROSS, AREA_PROJECTION_XZ_GROSS, AREA_PROJECTION_YZ_GROSS**

Shows the area of the "shadow" of a part, assembly, or cast unit at its local planes:
- XY-plane
- XZ-plane
- YZ-plane

**AREA_PROJECTION_XY_NET, AREA_PROJECTION_XZ_NET, AREA_PROJECTION_YZ_NET**

Shows the net area of the "shadow" of a part, assembly, or cast unit at its local planes:
- XY-plane
- XZ-plane
- YZ-plane

**AREA_PX, AREA_NX, AREA_PY, AREA_NY, AREA_PZ, AREA_NZ**

Shows the area of faces whose normal vector points to the positive or negative direction of the following local axes:

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>AREA_PX</td>
<td>Positive direction of local X-axis</td>
</tr>
<tr>
<td>AREA_NX</td>
<td>Negative direction of local X-axis</td>
</tr>
<tr>
<td>AREA_PY</td>
<td>Positive direction of local Y-axis</td>
</tr>
<tr>
<td>AREA_NY</td>
<td>Negative direction of local Y-axis</td>
</tr>
<tr>
<td>AREA_PZ</td>
<td>Positive direction of local Z-axis</td>
</tr>
<tr>
<td>AREA_NZ</td>
<td>Negative direction of local Z-axis</td>
</tr>
</tbody>
</table>
**ASSEMBLY.LOCK_PERMISSION**

Shows the effective permission for the assembly. Options are **ALL** or **NONE**.

*See also*

ASSEMBLY.OBJECT_LOCKED (page 17)
ASSEMBLYOWNER_ORGANIZATION (page 17)

**ASSEMBLY.OBJECT_LOCKED**

Shows the value of the object lock. The value options are **Yes**, **No**, and **Organization**.
The object lock status can be modified in the **Object locks** dialog box.

*See also*

ASSEMBLYOWNER_ORGANIZATION (page 17)
ASSEMBLY.LOCK_PERMISSION (page 16)

**ASSEMBLY_OWNER_ORGANIZATION**

Shows the name of the organization that owns the assembly lock. The organization is based on the Windows account.

*See also*

ASSEMBLY.OBJECT_LOCKED (page 17)
ASSEMBLY.LOCK_PERMISSION (page 16)

**ASSEMBLY_BOTTOM_LEVEL**

Shows the bottom level of the main part of an assembly.

Bottom level takes the unit and accuracy from the MarkDimensionFormat.dim file.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

**NOTE**  This attribute returns the value as text, so you cannot use formulae with this attribute. Use ASSEMBLY_BOTTOM_LEVEL_UNFORMATTED (page 18) instead.
See also

**ASSEMBLY_BOTTOM_LEVEL_GLOBAL**

Shows the bottom level of the main part of an assembly by global axis. The bottom level takes the unit and accuracy from the MarkDimensionFormat.dim file.

You can use this attribute as a user-defined attribute in part marks and associative notes, and also in reports and templates.

See also

**ASSEMBLY_BOTTOM_LEVEL_GLOBAL_UNFORMATTED**

Shows the bottom level of an assembly by global axis. Unformatted level returns the bottom levels as a length in mm so you can format them and include them into formulas in templates.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

**ASSEMBLY_BOTTOM_LEVEL_UNFORMATTED**

Shows the unformatted bottom level of the main part of an assembly. Unformatted level returns the top levels as a length in mm so you can format them and include them into formulas in templates.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

**NOTE** Unlike the BOTTOM_LEVEL attribute, the BOTTOM_LEVEL_UNFORMATTED attribute cannot be formatted through the MarkDimensionFormat.dim file.

See also
**ASSEMBLY_DEFAULT_PREFIX**

Shows the default value for the assembly prefix defined in the part properties dialog box.

**ASSEMBLY_PLWEIGHT**

Shows the weight of plates attached to an assembly. For other objects it shows a zero.

**ASSEMBLY_POS**

Shows the assembly position number. For parts it shows the assembly position number of the assembly that contains the part. For bolts the field is blank.

**ASSEMBLY_POSITION_CODE**

Shows the assembly position code. The code identifies the grid position. The position of the objects is calculated based on the closest grid.

<table>
<thead>
<tr>
<th>Assembly</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>A/1</td>
<td>&lt;A/2</td>
</tr>
<tr>
<td>A/2</td>
<td>A-B/1</td>
</tr>
<tr>
<td>A/3</td>
<td>&lt;A-B/1-2</td>
</tr>
<tr>
<td>A/4</td>
<td>A/2</td>
</tr>
<tr>
<td>A/6</td>
<td>A-B/1-2</td>
</tr>
<tr>
<td>A/7</td>
<td>B/2</td>
</tr>
</tbody>
</table>
**TOLERANCE LINE**

The position code consists of grid line labels in the x and y directions (alternatively in the z direction). If an assembly begins or ends outside the first or last grid line, a < or > character is included in the position code. For example, if an assembly begins outside the A grid line, this field shows: <A/2.

If an assembly is completely within a tolerance distance (by default 500 mm) of grid line A, the position code is the label of that grid line: A.

If the assembly is partially or entirely outside the tolerance distance, the code is a combination of grid labels: A-B.

To change the default tolerance distance, set the advanced option XS ASSEMBLY_POSITION_CODE_TOLERANCE=750 (for example).

To include the Z orientation in the code, set the advanced option XS ASSEMBLY_POSITION_CODE_3D to TRUE. The code would be similar to: <A-B/1-2/1+-1000

Tekla Structures selects the grid to use as follows:
1. Tekla Structures checks the location of the assembly.
2. If it is located inside several grids, Tekla Structures checks whether the assembly is parallel to grid lines or the plane.
3. If there are several parallel grids, Tekla Structures selects the closest.

**ASSEMBLY_PREFIX**
Shows the assembly prefix, defined in the part properties dialog box.

**ASSEMBLY_SERIAL_NUMBER**
Shows the assembly number without prefix and separator.

**ASSEMBLY_START_NUMBER**
Shows the assembly start number.

See also

**ASSEMBLY_TOP_LEVEL**
Shows the top level of an assembly.
Top level takes the unit and accuracy from the MarkDimensionFormat.dim file.
You can use this attribute as a user-defined attribute also in part marks and associative notes.

**NOTE** This attribute returns the value as text, so you cannot use formulae with this attribute. Use ASSEMBLY_TOP_LEVEL_UNFORMATTED (page 22) instead.

See also
**ASSEMBLY_TOP_LEVEL_GLOBAL**

Shows the top level of an assembly by global axis. The top level takes the unit and accuracy from the `MarkDimensionFormat.dim` file.

You can use this attribute as a user-defined attribute in part marks and associative notes, and also in reports and templates.

*See also*

**ASSEMBLY_TOP_LEVEL_GLOBAL_UNFORMATTED**

Shows the top level of an assembly by global axis. Unformatted level returns the top levels as a length in mm so you can format them and include them into formulas in templates.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

**ASSEMBLY_TOP_LEVEL_UNFORMATTED**

Shows the unformatted top level of the main part of an assembly. Unformatted level returns the top levels as a length in mm so you can format them and include them into formulas in templates.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

**NOTE**  Unlike the ASSEMBLY_TOP_LEVEL attribute, the ASSEMBLY_TOP_LEVEL_UNFORMATTED attribute cannot be formatted through the `MarkDimensionFormat.dim` file.

**axial1, axial2**

Shows the values entered in the Tension, T box on the End codes tab in the user-defined attributes dialog box of the part. `axial1` shows the value in the Start box and `axial2` in the End box.

**1.2  B**
**BOLT_COUNTERSUNK**

Use to check or show if a bolt is countersunk. The attribute returns the value 1 for countersunk bolts, otherwise it returns 0.

*See also*

HEAD_TYPE (page 54)

**BOLT_EDGE_DISTANCE**

Shows the edge distance of a bolt.

**BOLT_EDGE_DISTANCE_MIN**

Shows the edge distance multiplied by the coefficient set in the modeling settings in **File menu --> Settings --> Options --> Components**.

**BOLT_FULL_NAME**

Shows the name of a bolt defined in the bolt catalog, without the standard. For objects other than bolts, the field shows a blank.

*See also*

BOLT_SHORT_NAME (page 23)

**BOLT_MATERIAL_LENGTH**

For bolts this field shows the total thickness of the connected material.

**BOLT_NPARTS**

For bolts this field shows the number of connected parts.
BOLT_SHORT_NAME

Shows the name of the washer, bolt, nut or screw in a short format.

See also
BOLT_FULL_NAME (page 23)

BOLT_STANDARD

As for TYPE (page 92).

BOLT_THREAD_LENGTH

Shows the length of the threaded part of the bolt shaft.

BOTTOM_LEVEL

Shows the bottom level of a single part, cast unit, assembly, part of a connection or a pour object.

Bottom level takes the unit and accuracy from the MarkDimensionFormat.dim file.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

NOTE  This attribute returns the value as text, so you cannot use formulae with this attribute. Use BOTTOM_LEVEL_UNFORMATTED (page 25) instead.

BOTTOM_LEVEL_GLOBAL

Shows the bottom level of a single part, cast unit, assembly, part of a connection or a pour object by global axis. BOTTOM_LEVEL_GLOBAL takes the unit and accuracy from MarkDimensionFormat.dim.

You can use this attribute as a user-defined attribute in part marks and associative notes, and also in reports and templates.
**BOTTOM_LEVEL_GLOBAL_UNFORMATTED**

Shows the bottom level of a single part, cast unit, assembly, part of a connection or a pour object. **BOTTOM_LEVEL_GLOBAL_UNFORMATTED** returns the bottom levels as a length in mm so you can format them and include them into formulas in templates. This attribute gives level information by the global axis.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

**BOTTOM_LEVEL_UNFORMATTED**

Shows the unformatted bottom level of a single part, cast unit, assembly, part of a connection or a pour object. **BOTTOM_LEVEL_UNFORMATTED** returns the bottom levels as a length in mm so you can format them and include them into formulas in templates.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

---

**NOTE**  
Unlike the **BOTTOM_LEVEL** attribute, the **BOTTOM_LEVEL_UNFORMATTED** attribute cannot be formatted through the MarkDimensionFormat.dim file.

---

**BOUNDING_BOX_xxx**

The following template attributes give the bounding box of the objects as X, Y or Z minimum or maximum distances from the absolute zero (0,0,0):

- **BOUNDING_BOX_MIN_X**
- **BOUNDING_BOX_MAX_X**
- **BOUNDING_BOX_MIN_Y**
- **BOUNDING_BOX_MAX_Y**
- **BOUNDING_BOX_MIN_Z**
- **BOUNDING_BOX_MAX_Z**

These attributes are available for parts, assemblies, cast units, reference models and reference objects.
**UILDER**

Shows the builder’s name defined in the **Project properties** in **File menu** --> **Project properties**.

**1.3 C**

**cambering**

Shows the value entered in the **Camber** box on the **Parameters** tab in the user-defined attributes dialog box of the part.

See also

**CANTILEVER**

Shows the length of a protruding part of a profile. Below is an example of a welded box profile:

See also

PROFILE (page 76)

**CAST_UNIT_BOTTOM_LEVEL**

Shows the bottom level of a cast unit.

You can use this attribute as a user-defined attribute also in part marks and associative notes.
CAST_UNIT_HEIGHT_ONLY_CONCRETE_PARTS
Shows the height of a cast unit including all concrete parts.

See also

CAST_UNIT_HEIGHT_ONLY_PARTS
Shows the height of a cast unit, including all concrete parts, steel parts and parts made of miscellaneous material.

See also

CAST_UNIT_HEIGHT_TOTAL
Shows the total height of a cast unit, including all concrete parts, steel parts and parts made of miscellaneous material, reinforcing bars, surface treatments and bolts.

See also

CAST_UNIT_LENGTH_ONLY_CONCRETE_PARTS
Shows the length of a cast unit including all concrete parts.

See also

CAST_UNIT_LENGTH_ONLY_PARTS
Shows the total length of a cast unit, including all concrete parts, steel parts and parts made of miscellaneous material.

See also
**CAST_UNIT_LENGTH_TOTAL**

Shows the total length of a cast unit, including all concrete parts, steel parts and parts made of miscellaneous material, reinforcing bars, surface treatments and bolts.

*See also*

**CAST_UNIT_POS**

Shows the position of a cast unit. The position consists of a prefix and a number.

**CAST_UNIT_POSITION_CODE**

Shows the position code of a cast unit. The code identifies the grid position. For more information, see ASSEMBLY_POSITION_CODE (page 19).

**CAST_UNIT_PREFIX**

Shows the cast unit prefix, defined in the part properties dialog box.

**CAST_UNIT_REBAR_WEIGHT**

Shows the weight of reinforcing bars in a cast unit.

**CAST_UNIT_SERIAL_NUMBER**

Shows the cast unit number without prefix and separator.

**CAST_UNIT_TOP_LEVEL**

Shows the top level of a cast unit.

You can use this attribute as a user-defined attribute also in part marks and associative notes.
CAST_UNIT_TYPE

Returns the type of the cast unit as text (Precast or Cast in place).
For more information on cast unit types, see .

CAST_UNIT_VERTICAL_POSITION_CODE

Outputs the grid level height of a cast unit, for example +7200. The center of gravity point is used to determine the grid level for the cast unit. If the center of gravity is more than 100 mm away from the grid level, then two grid levels will be output separated with dash: the lower and higher grid levels, for example, +3600-+7200.

See also
ASSEMBLY_POSITION_CODE (page 19)

CAST_UNIT_WIDTH_ONLY_CONCRETE_PARTS

Shows the width of a cast unit including all concrete parts.

See also

CAST_UNIT_WIDTH_ONLY_PARTS

Shows the total width of a cast unit, including all concrete parts, steel parts and parts made of miscellaneous material.

See also

CAST_UNIT_WIDTH_TOTAL

Shows the total width of a cast unit, including all concrete parts, steel parts and parts made of miscellaneous material, reinforcing bars, surface treatments and bolts.

See also
CATALOG_NAME
Shows the name of a mesh catalog.

CC
Shows the center-to-center spacing of evenly-distributed reinforcing bars or a mesh.

CC_CROSS
Shows the center-to-center spacing of crossing bars in a reinforcement mesh.

CC_EXACT
Shows the center-to-center spacing of a reinforcing bar group or a mesh.

CC_EXACT_CROSS
Shows all center-to-center spacings of crossing bars in a reinforcement mesh.

CC_EXACT_LONG
Shows all center-to-center spacings of longitudinal bars in a reinforcement mesh.

CC_LONG
Shows the center-to-center spacing of longitudinal bars in a reinforcement mesh.

CC_MAX
Shows the largest center-to-center spacing in reinforcing bar groups or meshes with varied spacing.
**CC_MAX_CROSS**
Shows the largest center-to-center spacing of crossing bars in reinforcement meshes with varied spacing.

**CC_MAX_LONG**
Shows the largest center-to-center spacing of longitudinal bars in reinforcement meshes with varied spacing.

**CC_MIN**
Shows the smallest center-to-center spacing in reinforcing bar groups or meshes with varied spacing.

**CC_MIN_CROSS**
Shows the smallest center-to-center spacing of crossing bars in reinforcement meshes with varied spacing.

**CC_MIN_LONG**
Shows the smallest center-to-center spacing of longitudinal bars in reinforcement meshes with varied spacing.

**CHANGES**
The `CHANGES` attribute tells the changes occurred in a drawing, for example, if the drawing is changed while it is issued, or if part have been modified. This attribute can be used for adding **Drawing List** information about changes in drawing reports. Also the **Drawing List** has a column **Changes** for this information.

Below is an example of the changes column in the **Drawing List**.
CHECKED_BY

This attribute gets the value entered in the Checked By box on the Status tab in the user-defined attributes dialog box of the part or in the assembly properties dialog box. Also shows the value that you have entered in the Checked By field in the Revision Handling dialog box.

CHECKED_DATE

Shows the value entered in the Date Checked box on the Status tab in the user-defined attributes dialog box of the part or in the assembly properties dialog box.

CLASS

Only use to set rules in the Template Editor. It shows the string ASSEMBLY for assemblies, PART for parts, and BOLT for bolts, holes, nuts etc. For drawings it shows DRAWING, and for revisions it shows REVISION.

CLASS_ATTR

Shows the attribute class of parts and bolts. For assemblies it shows the attribute class of the assembly main part.
CODE
Shows the abbreviation code of a surface treatment, for example, TS1 for Tile surface 1.
Surface treatment codes and names are defined in the product_finishes.dat file.

See also
SURFACING_NAME (page 89)

COG_X, COG_Y, COG_Z
Shows the coordinates of the center of gravity of assemblies, parts, or welds:
• For parts, assemblies, and cast units the attributes COG_X, COG_Y, and COG_Z return values in global coordinate system.
• For welds the attributes COG_X, COG_Y, and COG_Z return values in local coordinate system (current work plane grid).
These attributes cannot be used in headers or footers.

comment
User-defined attribute Comment, defined in the object's user-defined attributes dialog box. For more information on the user-defined attributes in templates and reports, see .

CONN_CODE_END1, CONN_CODE_END2
Shows the values entered in the Connection code box on the End codes tab in the user-defined attributes dialog box of the part. CONN_CODE_END1 shows the value in the Start box and CONN_CODE_END2 in the End box.

See also

CONNECTED_ASSEMBLIES
For bolts this field shows a string containing the position numbers of assemblies of connected parts (e.g. A17 A18 A23). In ASSEMBLY_BOLT lists Tekla Structures does not show the position number of the current assembly.
Only use this field as an inquiry command for single bolts. For objects other than bolts the field is blank.

**CONNECTED_PARTS**
Shows a string containing the position numbers of connected parts (e.g. P102 - P17 P18 P23) for bolts. If the list type is ASSEMBLY_BOLT, the first position number is a member of the current assembly. Only use as an inquiry command for single bolts. For objects other than bolts the field is blank.

**CONNECTION_CODE**
Shows the connection code defined in the connection properties dialog box. Only for use in connection lists.

**CONNECTION_DSTV**
Shows the DSTV code of the connection in connection lists. This field blank if the connection is not a DSTV connection. Only for use in connection lists.

**CONNECTION_ERROR**
Shows the error flag of a connection in connection lists. Only for use in connection lists.
The values returned are:
- 1=green connection symbol
- 2=yellow connection symbol
- 3=red connection symbol
- 4=connection did not pass design check

**CONNECTION_GROUP**
Shows the class of the component, available on the General tab in the component dialog box. Only for use in connection lists.
**CONNECTION_NUMBER**
Shows the number of a connection.

**CONNECTION_RUNNING_NUMBER**
Shows the running number of a connection. All connections are automatically numbered with a running number.

**CONTENTTYPE**
Shows the content type of the current row.

See also

**COVER_AREA**
Shows the total cover area of the part profile, or of the main part profile in the assembly or cast unit.

See also
PROFILE (page 76)

**CREATED_BY**
This attribute gets the name of the revision creator.

**CROSS_SECTION_AREA**
Shows the area (mm2) of a cross section.

See also
PROFILE (page 76)
**CURRENT_PHASE**

Shows the current active phase. Used for filtering parts. You can also use selection filters.

**CURVED_SEGMENTS**

Returns the number of segments of a curved beam.

**See also**

**CUSTOM.ELEMENT_WEIGHT**

This custom template attribute sums up net weights of all cast unit and subassembly parts, but ignores all subassemblies whose main part's MATERIAL_TYPE is STEEL.

The same weight is wanted to be reported

1. early in the project when only sample elements are detailed but the great majority of the elements is not
2. in the final stage of the project when all elements have been fully detailed

The CAST_UNIT.WEIGHT attribute also takes into account the weight of all embedded subassemblies, such as lifting anchors and cable loops. This is not wanted as the reinforcement and embed weights are already included into a little bit exaggerated concrete density.

**CUSTOM.HC_xxx**

The following part-specific opening and area calculations are available for Hollowcore slabs. The calculations can be output with custom reports.

The report property names are:

- **CUSTOM.HC_GROSS_AREA**: This is the gross area calculated by formula \( L \times B \), where \( L \) is the max length of the slab and \( B \) is the width of the original hollow core slab section before any narrow cutting of the slab.

- **CUSTOM.HC_INSUL_CUT_L**: This is the total linear length of insulation cutting measured along insulation edges where the edge of insulation is not overlapping with exterior edges of the slab.

- **CUSTOM.HC_NET_AREA**: This is the net area of the hollow core slab. The net area is excluding all openings penetrating.
• **CUSTOM.HC_OPENINGS_L**: This is the total perimeter length of all openings in the slab. The perimeter is measured along the “shape boundary” of the opening.

• **CUSTOM.HC_RECESSES_L**: This is the total perimeter of recesses (not fully penetrating the slab thickness). The perimeter is measured along the “shape boundary” of the recess.

• **CUSTOM.HC_SAWINGS_END_L**: This is the total linear length of skew end sawings in the slab. Please note that the straight ends are not counted to the total sawing length.

• **CUSTOM.HC_SAWINGS_END_N**: This is the total number of individual sawing lines.

• **CUSTOM.HC_SAWINGS_SIDE**: This is the total length of sawing parallel to center axis of the slab.

In Template Editor these attributes are located in the CUSTOM subfolder in the **Attribute** dialog box.

---

**CUSTOM.MESH_xxx**

The following attributes are available for reinforcement meshes:

• **CUSTOM.MESH_LENGTH_NET** *(distance)*

• **CUSTOM.MESH_WIDTH_NET** *(distance)*

• **CUSTOM.MESH_SIZE_NET** *(text)*

All these attributes are calculated based on the mesh wires considering all cuts. The net length is always the longer dimension of the mesh and the net width is the shorter. The net size is always expressed based on net length and net width including the text for sizes and spacings.

The calculations can be output with custom reports. In Template Editor they are located in the CUSTOM subfolder in the **Attributes** dialog box.

We recommend that you use these attributes instead of any other mesh attributes for size calculations.

Tekla Structures length inquiry gives the whole length, whereas the **MESH_LENGTH_NET** gives the length of the mesh itself.
Tekla Structures size inquiry gives the size so that it gives the height first and the width last, whereas MESH_SIZE_NET reports the width first and the height last: 20/8-100/200-\textbf{5950/2950}.

\textbf{CUSTOM.REBAR SHAPE COUPLERS}

The \texttt{CUSTOM.REBAR SHAPE COUPLERS} custom template attribute shows in pull-out pictures the reinforcing bar geometry, bending dimensions, and the graphical symbols representing the couplers at the bar ends. The coupler data is taken from the user-defined attributes from the rebar coupler components \texttt{Rebar coupler}, \texttt{Rebar end anchor} and \texttt{Split rebar and add coupler}.
Note that the `CUSTOM.REBAR_SHAPE_COUPLERS` attribute is available only in graphical fields when the content type is `REBAR`.

In Tekla Structures, ensure that a drawing layout contains the desired table. By default, the `rebar_with_couplers` table is available in the Drawing layout properties.

The drawing needs to contain at least some reinforcing bars as otherwise the table does not have anything to show.

### Customize the symbols for couplers and end anchors

You can customize how the symbols for couplers and end anchors are shown.

1. **You can define the mapping between the model properties and the actual symbol for various types of couplers or end anchors.**

   The mapping is handled in the `RebarCoupler.Symbols.dat` file, located by default in `..<ProgramData\Tekla Structures\<version>\environments\common\system`. *The file can be placed under the model folder or under any of the common system folders defined by the advanced options `XS_PROJECT`, `XS_FIRM`, and `XS_SYSTEM`. For instructions on how to control the mapping, see the `RebarCoupler.Symbols.dat` file.*

   You can give both the symbol file name and symbol number in the configuration file `RebarCoupler.Symbols.dat`. If the symbol file name is not given, the default file (`CouplerSymbols.sym`) will be used. For more details, see sample files included in the environments.

2. **You can create your own symbols that are drawn at the reinforcing bar ends.**

   All symbols to be used are in the symbol file `CouplerSymbols.sym`, located by default in `..<ProgramData\Tekla Structures\<version>\environments\common\symbols`. *You can create and add new symbols in Symbol Editor.*
The following part-specific opening and area calculations are available for Sandwich wall. The calculations can be output with custom reports.

- CUSTOM.WALL_CORNER_AREA: This is the façade area of the turning corner in the wall. The turning has to be modeled following the "Modeling guidelines for precast concrete design" in order to get valid corner area values.

- CUSTOM.WALL_GROSS_AREA: This is the gross area of the wall.

- CUSTOM.WALL_NET_AREA: This is the net area of the wall. All openings inside the wall and/or at exterior boundaries of the wall are excluded.

- CUSTOM.WALL_OPENINGS_AREA: This is the total area of all openings inside the wall and/or at exterior boundaries of the wall.

- CUSTOM.WALL_OPENINGS_N: This is the total number of openings inside the wall and/or at exterior boundaries of the wall.

In Template Editor these attributes are located in the CUSTOM subfolder in the Attribute dialog box.

The examples below show the gross and net areas of sandwich walls:

- Gross area: Calculation formula: \((H \times L)\), excluding possible lifting loops or other non-concrete materials. Area of turning corner shall be included in calculation.

- Net area: Calculation formula: \(H \times L - \sum A_i\)
Including turning corners in area calculation

To include turning corners in area calculation, ensure that you have the name of the turning corner part (L2 in the image above) listed in the SandwichWallCornerPartNames.dat file. This file lists all valid corner part names. When a report using any of these custom wall fields is generated for the first time, the file is searched in the normal file search order, starting from the model folder and then continuing the search from the folders defined for the advanced options XS_PROJECT, XS_FIRM, and XS_SYSTEM. The first file found will be loaded.

**NOTE** The SandwichWallCornerPartNames.dat file is not re-loaded even if another model is opened and thus it may happen that the report is based on a file from another model.
DATE
Used to be DATE. Shows the current date. If the advanced option XS_IMPERIAL_DATE is set, the date format is mm/dd/yyyy. Otherwise the format is dd.mm.yyyy.

REVISION content type:
In drawing templates this field shows the last revision date. In REVISION lists it also shows the revision history.

DATE_APPROVED
In templates shows the approval date of the drawing entered in the Revision Handling dialog box.

DATE_CHECKED
This attribute shows the date when a drawing was checked. This attribute can be included in templates. The attribute field is located in the Revision Handling dialog box.

DATE>Create
Shows the creation date of the drawing. If the advanced option is set, the format of the date is mm/dd/yyyy. Otherwise the format is dd.mm.yyyy.
In drawing templates this field shows the last revision date. In REVISION lists it also shows the revision history.

DATE_END
Shows the completion date of a project from the Project properties in File menu --> Project properties.

DATE_ISSUE
Shows the issue date of the drawing. Use with DRAWING content type.
**DATE_LAST**

In drawing templates this field shows the date of the last revision. In **REVISION** lists it also shows the entire revision history.

**DATE MODIFY**

Shows the date of the last changes to the drawing. If the advanced option is set, the date format is mm/dd/yyyy. Otherwise the format is dd.mm.yyyy.

Use in part, cast unit and assembly lists.

**DATE PLOT**

Shows the date the drawing was last printed. If the advanced option is set, the date format is mm/dd/yyyy. Otherwise the format is dd.mm.yyyy.

Use in drawing tables and drawing reports. You can also use this template attribute in part, assembly and cast unit lists with **DRAWING.DATE_PLOT** value field formula.

**NOTE** If you have set the advanced option to **TRUE**, the drawing plot date is not stored to the database. When you set it to **FALSE**, the drawing plot date is stored.

**DATE START**

Shows the starting date of the project entered in the **Project properties** in **File menu --> Project properties**.

**DELIVERY**

This attribute shows the value entered in the **Delivery** box in the **Revision Handling** dialog box.
DESCRIPTION

Shows the value entered in the Description box in the user-defined attributes dialog box of the project (File menu -> Project Properties -> User-defined attributes).

Shows the revision Description entered in the Revision Handling dialog box for a drawing.

DESIGNER

Shows the name of the designer in the Project properties in File menu -> Project properties.

DesignGroup

Shows the values entered in the Design Group (optimisation) box on the Analysis tab in the user-defined attributes dialog box of the part.

See also

DIAMETER

Shows the bolt, nut, screw, washer, stud shank, hole or part profile diameter, depending on the content type you use.

WASHER content type:
• The inner diameter of the washer.

NUT content type:
• The inner diameter of the nut.

SCREW content type:
• The screw diameter.

STUD content type:
• The diameter of the stud shank.

See also

PROFILE (page 76)
**DIAMETER_1, DIAMETER_2**

Shows the diameters of a tapered profile. Below diameters of parametric profile PD:

See also
PROFILE (page 76)

**DIAMETER_X**

Shows the length of the slotted hole in the X direction (hole size + tolerance + LONG_HOLE_X).

Use with BOLT, HOLE, NUT and WASHER content types.

**DIAMETER_Y**

Shows the length of the slotted hole in the Y direction (hole size + tolerance + LONG_HOLE_Y).

Use with BOLT, HOLE, NUT and WASHER content types.

**DIM_A ... DIM_G, DIM_H1, DIM_H2, DIM_I, DIM_J, DIM_K1, DIM_K2, DIM_L, DIM_O, DIM_R, DIM_R_ALL, DIM_TD, DIM_WEIGHT, DIM_X, DIM_Y**

Show dimensions of bent reinforcing bars based on the mappings in the rebar_schedule_config.inp file, located in the ..\ProgramData\Tekla Structures\<version>\environments\<environment>\system folder. These mappings are environment-specific by default. You can modify them to suit your company or project needs.

DIM_TD shows the diameter of the bending cylinder, DIM_R shows the radius. DIM_R_ALL shows multiple radiuses.

**TIP** When you use DIM_R_ALL in a value field, use Text as Datatype and DistanceList as Meaning.
See also

Reinforcement in templates

Hard-coded bending type identifiers in reinforcement shape recognition

ANG_S, ANG_T, ANG_U, ANG_V (page 12)

\[
\text{DIM}_A\_\text{MAX, DIM}_G\_\text{MAX, DIM}_H1\_\text{MAX, DIM}_H2\_\text{MAX, DIM}_I\_\text{MAX, DIM}_J\_\text{MAX, DIM}_K1\_\text{MAX, DIM}_K2\_\text{MAX, DIM}_O\_\text{MAX, DIM}_R\_\text{MAX, DIM}_TD\_\text{MAX, DIM}_X\_\text{MAX, DIM}_Y\_\text{MAX}
\]

Shows the maximum dimensions of bent reinforcing bars in tapered cross sections. For more information, see Hard-coded bending type identifiers in reinforcement shape recognition.

\[
\text{DIM}_A\_\text{MIN, DIM}_G\_\text{MIN, DIM}_H1\_\text{MIN, DIM}_H2\_\text{MIN, DIM}_I\_\text{MIN, DIM}_J\_\text{MIN, DIM}_K1\_\text{MIN, DIM}_K2\_\text{MIN, DIM}_O\_\text{MIN, DIM}_R\_\text{MIN, DIM}_TD\_\text{MIN, DIM}_X\_\text{MIN, DIM}_Y\_\text{MIN}
\]

Shows the minimum dimensions of bent reinforcing bars in tapered cross sections. For more information, see Hard-coded bending type identifiers in reinforcement shape recognition.

\[
\text{DRAWING\_USERFIELD\_1 ... \_8}
\]

Shows the value of the user-defined attribute of the drawing that you can define in the User field 1, User field 2, and so on, boxes on the Parameters tab in the user-defined attributes dialog box of the drawing.

\[
\text{DR\_DEFAULT\_HOLE\_SIZE}
\]

Shows the default bolt hole size that you define in drawing properties. This attribute is for template purposes only.

The default bolt hole size (Bolt size limit) in the bolt mark properties defines the default size of bolt holes. This setting defines the size of bolt holes that do not have bolt marks in drawings.
**DR_DEFAULT_WELD_SIZE**

Shows the default weld size that you define in drawing properties. This attribute is for template purposes only. It can be found under **Drawing** content type in Template Editor.

The default weld size (**Weld size limit**) in weld properties defines the minimum size of welds to show in drawings.

**DR_PART_POS**

Shows the position number of the drawing main part. Can be used in drawing templates and drawing reports.

**DR_PART_POS** returns attribute **PART_POS** in all other drawing types, except for the assembly and cast unit drawings, where it returns **ASSEMBLY_POS** attribute value.

### 1.5 E

**ECCENTRICITY_X, ECCENTRICITY_Y**

Shows the eccentricity dimensions of a profile. Below the eccentricity x dimension of the RCXX profile:

![Diagram of eccentricity dimensions](image)

**See also**

PROFILE (page 76)
**EDGE_FOLD, EDGE_FOLD_1, EDGE_FOLD_2**
Shows the edge fold dimensions of a profile. Edge fold dimension 1 and 2 concern unsymmetrical profiles. See the example of a CC profile below:

![Edge fold dimensions](image)

1. EDGE_FOLD_1
2. EDGE_FOLD_2

See also
PROFILE (page 76)

**END_X, END_Y, END_Z**
Shows the coordinates of the end points used to create a part.

**END1_ANGLE_Z**
Shows the end angle of the first end of a profile in the local z-direction, for parts with cross-section profiles.

**END1_ANGLE_Y**
Shows the end angle of the first end of a profile in the local y-direction, for parts with cross-section profiles.

**END2_ANGLE_Z**
Shows the end angle of the second end of a profile in the local z-direction, for parts with cross-section profiles.
**END2_ANGLE_Y**
Shows the end angle of the second end of the profile in the local y-direction, for parts with cross-section profiles.

**END1_CODE, END2_CODE**
Shows the shape information of the first and second ends of a profile, for parts with cross-section profiles. The options are:
- 0 = no operation
- 1 = fitting
- 2 = cut
- 3 = fitting and cut

**END1_SKEW, END2_SKEW**
Shows 1 (INTEGER) if the corresponding end of a part has a skewed cut or fitting and 0 if the end is straight.

**ERECTIONSTATUS**
Shows the value selected in the Erection Status list on the Status tab in the user-defined attributes dialog box of the part.

**EXTRA_LENGTH**
Shows the bolt extra length.

**1.6 F**

**fabricator**
Shows the value entered in the Fabricator name box on the Parameters tab in the user-defined attributes dialog box of the part.
**FATHER_ID**
Shows the ID of the part that a reinforcement mesh belongs to.
Note that part IDs are temporary, and may change when you reopen a model, or use the read in command in Tekla Model Sharing, for example.

**FINISH**
Shows the final properties of a part defined in the properties dialog box (for example, in the beam properties dialog box). For all other objects the field is blank.

**FLANGE_LENGTH_B**
Shows the total length of the lower flange of an I profile. Use when you need to show welded profiles as plates.

**FLANGE_LENGTH_U**
Shows the total length of the upper flange of an I profile. Use when you need to show welded profiles as plates.

**FLANGE_SLOPE_RATIO**
Shows the slope ratio of a flange.

*See also*
PROFILE (page 76)

**FLANGE_THICKNESS**
Shows the thickness of a flange.

*See also*
PROFILE (page 76)
**FLANGE_THICKNESS_1, FLANGE_THICKNESS_2**
Shows the flange thicknesses of unsymmetrical profiles, such as in unsymmetrical RCDL profile:

![Flange thickness diagram](image)

*See also*
PROFILE (page 76)

**FLANGE_THICKNESS_B**
Shows the thickness of the lower flange of an I profile. Use when you need to show welded profiles as plates.

*See also*
PROFILE (page 76)

**FLANGE_THICKNESS_U**
Shows the thickness of the upper flange of an I profile. Use when you need to show welded profiles as plates.

*See also*
PROFILE (page 76)

**FLANGE_WIDTH**
Shows the width of a flange.

*See also*
PROFILE (page 76)
**FLANGE_WIDTH_1, FLANGE_WIDTH_2**
Shows the flange widths of unsymmetrical profiles.

See also
PROFILE (page 76)

**FLANGE_WIDTH_B**
Shows the width of the lower flange of an I profile. Use when you need to show welded profiles as plates.

See also
PROFILE (page 76)

**FLANGE_WIDTH_U**
Shows the width of the upper flange of an I profile. Use when you need to show welded profiles as plates.

See also
PROFILE (page 76)

**FOLD_ANGLE**
Shows the fold angle of a profile.

See also
PROFILE (page 76)

1.7  G

**GROUP_TYPE**
Shows the group type of a reinforcing bar:
- Normal = 0
- Tapered = 1
• Tapered 2 = 2
• Tapered curved = 3
• Tapered N = 4
• Spiral = 5

GRADE
Shows the grade of the object. Use with BOLT, NUT, MESH, REBAR, and STUD content types.

GUID
Shows GUID, which is a globally unique identifier.

NOTE The report property GUID adds the prefix “ID” to the value. For example, ID56497C3E-0000-06F6-3134-343736353635.

1.8 H

HAS_CONNECTIONS
Use to check whether a part contains connections. The attribute returns 1 if the part contains connections, otherwise it returns 0.

HAS HOLES
Use to check whether a part contains bolt holes. The attribute returns 1 if the part contains bolt holes, otherwise it returns 0.
This attribute does not take cuts into account.

HEAD DIAMETER
Shows the diameter of the stud head.
**HEAD_THICKNESS**
Shows the thickness (height) of the stud head.

**HEAD_TYPE**
Shows the type of the bolt head.

<table>
<thead>
<tr>
<th>Bolt head type</th>
<th>Description</th>
<th>Image</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hex-headed</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td>2</td>
<td>Round- or cup-headed</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td>3</td>
<td>Flat-headed or countersunk</td>
<td><img src="image3.png" alt="Image" /></td>
</tr>
</tbody>
</table>

See also
BOLT_COUNTERSUNK (page 23)

**HEIGHT**
Shows the height of an object.

**DRAWING** content type:
- The height of the drawing.

**ASSEMBLY** content type:
- The height of the assembly main part for assemblies, parts, and bolts.

**PART** content type:
- The height of single-part or assembly drawings. Use in part and assembly lists.

See also
PROFILE (page 76)
HEIGHT_1 ... 4
Shows the height dimensions of unsymmetrical profiles, such as in RCDX profile below:

\[
\begin{align*}
&h_1 \\
&h_2 \\
&h_3 \\
&h_4
\end{align*}
\]

See also
PROFILE (page 76)

HIERARCHY_LEVEL
Shows the hierarchical level of an assembly. The possible values are:
- 0: The assembly is on the highest level of the hierarchy.
- 1: The assembly is on the highest level in a nested assembly.
- 2: The assembly does not have any nested assemblies within it.
- Any other number: The assembly is a nested assembly within another assembly. The number defines the level of the assembly in the assembly hierarchy.

HISTORY
Use to retrieve information on the model history in multi-user models. You can use this template attribute with content types PART, SURFACING, REBAR, CONNECTION and DRAWING.

The following attributes can be used with the HISTORY attribute:
- CREATED
- CREATED_BY
- MODIFIED
- MODIFIED_BY
- MODIFIED_ACTION
- TOUCHED
- TOUCHED_BY
- TOUCHED_ACTION
• OWNER

Example
To find out which user has created an object in the model, use the combination HISTORY.CREATED_BY.

Limitations
• This template attribute works only in multi-user models.
• You need to turn on the collection of model history.
• Information cannot be retrieved for deleted objects.
• Changes in user-defined attributes do not affect this template attribute.

HOLE.DIAMETER
The HOLE.DIAMETER attribute returns the diameter of the holes in drawings. It only takes account the visible holes.

HOLE_TOLERANCE
Only use in bolt lists. Shows the bolt tolerance. Shows a zero in all other lists.

HOOK_START, HOOK_END
Shows 1 if there is a hook at the start or end of a reinforcing bar, and 0 if there is no hook.

HOOK_START_ANGLE, HOOK_END_ANGLE
Shows the angle of the hook at the start or end of a reinforcing bar.

HOOK_START_LENGTH, HOOK_END_LENGTH
Shows the length of the straight part of the hook at the start or end of a reinforcing bar.
**HOOK_START_RADIUS, HOOK_END_RADIUS**

Shows the internal bending radius of the hook at the start or end of a reinforcing bar.

1.9  

**ID**

Shows the identification number of an object. Use with all content types.

Note that object IDs are temporary, and may change when you reopen a model, or use the read in command in Tekla Model Sharing, for example.

**IFC_BUILDING**

Shows the value entered in the **IFC building name** box on the **IFC export** tab in the user-defined attributes dialog box of the part.

**See also**

Export a Tekla Structures model or selected model objects to...

**IFC_BUILDING_STOREY**

Shows the value entered in the **IFC building storey name** box on the **IFC export** tab in the user-defined attributes dialog box of the part.

**See also**

Export a Tekla Structures model or selected model objects to...
IFC_ENTITY

Shows the value selected in the IFC entity list on the IFC export tab in the user-defined attributes dialog box of the part.

See also
Export a Tekla Structures model or selected model objects to...

IFC_SITE

Shows the value entered in the IFC site name box on the IFC export tab in the user-defined attributes dialog box of the part.

See also
Export a Tekla Structures model or selected model objects to...

INFO1, INFO2

Shows the corresponding values in the Project properties in File menu -> Project properties.
Shows the Info 1 and Info 2 texts of the revision entered in the Revision Handling dialog box.

INNER_DIAMETER

Shows the inner diameter of an object in the bolt catalog, for example, washers or nuts.
Use with BOLT, HOLE, NUT, and WASHER content types.

INSTALL_ACTUAL

Shows the value selected in the Erection Actual field on the Status tab in the user-defined attributes dialog box of the part or in the assembly properties dialog box.
INSTALL_PLAN

Shows the value selected in the Erection Scheduled field on the Status tab in the user-defined attributes dialog box of the part or in the assembly properties dialog box.

IS_CONCEPTUAL

Use to check whether reinforcement is conceptual. The attribute returns TRUE if the reinforcement is conceptual, otherwise it returns FALSE.

IS_FROZEN

The IS_FROZEN attribute tells if the drawing is frozen. This attribute can be used for adding Drawing List information about frozen drawings in drawing reports. The report returns the value 1 if the drawing is frozen, and 0 if it is not frozen.

Also the Drawing List has a column Freeze for this information.

In the image below, you can see that one of the drawings is frozen (a flag in the Freeze column).

IS_ISSUED

The IS_ISSUED attribute tells if the drawing is issued. Issuing prevents the recreation of the drawing during drawing update. This attribute can be used for adding Drawing List information about issuing in drawing reports. The
report returns the value 1 if the drawing is issued, and 0 if it is not issued. Also the **Drawing List** has a column **Issue** for this information.

In the image below, you can see that one of the drawings has been issued (a flag in the **Issue** column).

---

**IS_ITEM**

Use to check whether an object is an item. The attribute returns 1 if the object is an item, otherwise it returns 0.

---

**IS_LOCKED**

The **IS_LOCKED** attribute tells if the drawing is locked. This attribute can be used for adding **Drawing List** information about locking in drawing reports. The report returns the value 1 if the drawing is locked, and 0 if it is not locked. Also the **Drawing List** has a column **Lock** for this information.

In the image below, you can see that one of the drawings is locked (a flag in the **Lock** column).
**IS_POLYBEAM**

Use to check whether a part is a polybeam. The attribute returns 1 if the part is a polybeam, otherwise it returns 0.

**IS_POUR_BREAK_VALID**

Use to check whether a pour break is valid, and to find invalid pour breaks. An invalid pour break does not split a pour object completely into two. The attribute returns the value 1 if the pour break is valid and 0 if the pour break is invalid.

**IS_READY_FORssue**

The IS READY FOR ISSUE attribute tells if the drawing has been marked ready for issuing in the Drawing list. This attribute can be used for adding Drawing list information about drawings marked for issuing in drawing reports. The report returns the value 1 if the drawing is marked ready for issuing, and 0 if it is not marked ready for issuing.

The Drawing list has a column Ready for issuing for this information. If the drawing has been marked, there is a check mark in the column.

To include in the report who has marked the drawing ready for issuing, use the attribute READY FOR ISSUE BY (page 79).
### LAST
The last revision number of a drawing (as an integer).

### LAST_APPROVED_BY
The **Approved by** information of the latest delivery of a drawing from the Revision Handling dialog box.

### LAST_CHECKED_BY
The **Checked by** information of the latest revision from the Revision Handling dialog box.

### LAST_CREATED_BY
The **Created by** information of the latest revision from the Revision Handling dialog box.

### LAST_DATE_APPROVED
The approval **Date** of the latest revision of a drawing from the Revision Handling dialog box.

### LAST_DATE_CHECKED
The **Checked by Date** of the latest revision of a drawing from the Revision Handling dialog box.
LAST_DATE_CREATE
In drawing templates this field shows the date of the last revision. In REVISION lists it also shows the entire revision history.

LAST_DELIVERY
The Delivery information of the latest revision from the Revision Handling dialog box.

LAST_DESCRIPTION
The Description of the latest revision from the Revision Handling dialog box.

LAST_INFO1
The Info 1 text of the latest revision of the drawing from the Revision Handling dialog box.

LAST_INFO2
The Info 2 text of the latest revision of the drawing from the Revision Handling dialog box.

LAST_MARK
In drawing templates this field shows the last revision mark. In REVISION lists, it also shows the entire revision history.

LAST_TEXT1...3
In drawing templates this field shows the text for the last revision. In REVISION lists it also shows the revision history.
LENGTH
Shows the length of assemblies, parts, and bolts including cuts and fittings.

LENGTH_GROSS
Shows the length of assemblies, parts, and bolts before cuts are made.

LENGTH_MAX
Shows the maximum length of a reinforcing bar in a reinforcing bar group.

LENGTH_MIN
Shows the minimum length of a reinforcing bar in a reinforcing bar group.

LOCKED_BY
The LOCKED_BY attribute tells who has locked a drawing. If the user who has locked the drawing has logged in with Trimble Identity, the account name is given, otherwise the user name is given. This attribute can be used for adding Drawing List information about who locked the drawing in drawing reports. Also the Drawing List has a column Locked by for this information.

LONG_HOLE_X
Shows the value from the Slotted hole X field in the Bolt properties dialog box. See also DIAMETER_X (page 45).

LONG_HOLE_Y
Shows the value from the Slotted hole Y field in the Bolt properties dialog box. See also DIAMETER_Y (page 45).
LOT_NUMBER
Shows the lot number to which the assembly belongs.

LOT_NAME
Shows the name of the lot to which the assembly belongs.

1.11 M

MAIN_PART
Shows 1 to indicate the main parts of assemblies and 0 for all other objects. Can be used for sorting.

To show a main part of an assembly on top of part lists:
1. In the Template Editor, add value field MAIN_PART to PART row.
2. Set the Order to Descending and (if needed) hide the field in output, in the Value Field Properties dialog box.
3. Drag the MAIN_PART field to be first in sort order in the Content browser.

MAJOR_AXIS_LENGTH_1 ... 2
Shows the major axis length dimensions of a tapered profile. Below d1 is the major axis length 1 and d2 is the major axis length 2 in parametric profile EPD.

See also
PROFILE (page 76)
MARK

In drawing templates this field shows the last revision mark. In the REVISION lists it also shows the revision history. The revision mark of the revision entered in the Revision Handling dialog box.

MATERIAL

Shows the material name for parts. Shows the material of the assembly main part for assemblies. Shows the grade entered in the Bolt assembly catalog dialog box for bolts.

MATERIAL_TYPE

Shows the material type of assemblies or parts. The material catalog contains the following predefined material types:

- STEEL
- CONCRETE
- REINFORCING BAR
- TIMBER
- MISCELLANEOUS

MESH_POS

Shows the position of a mesh as defined by the advanced option XS_REBAR_POSITION_NUMBER_FORMAT_STRING.

MINOR_AXIS_LENGTH_1 ... 2

Shows the minor axis length dimensions of a tapered profile. Below r1 is the minor axis length 1 and r2 is the minor axis length 2 in parametric profile EPD.

See also

PROFILE (page 76)
**MODEL**
Shows the name of the model.

**MODEL_PATH**
You can use the template attribute `MODEL_PATH` in all content types to find the path to the current model, for example `C:\TeklaStructuresModels\New Model 1`.

**MODEL_TOTAL**
Shows the number of similar objects in a model (i.e. those with the same position number).

**MODULUS_OF_ELASTICITY**
Shows the modulus of elasticity of a material from the material catalog.

**MOMENT_OF_INERTIA_X**
Shows the moment of inertia around the x-x reference axis of a cross section. Moment of inertia is also known as the second moment of area.

*See also*
PROFILE (page 76)

**MOMENT_OF_INERTIA_Y**
Shows the moment of inertia around the y-y reference axis of a cross section. Moment of inertia is also known as the second moment of area.

*See also*
PROFILE (page 76)
**moment1, moment2**

Shows the values entered in the **Moment, M** box on the **End codes** tab in the user-defined attributes dialog box of the part. moment1 shows the value in the **Start** box and moment2 in the **End** box.

**MORTAR_VOLUME**

Shows the mortar volume used in surface treatment.

1.12  N

**NAME**

The name of the object. If the object does not have a name, it is searched from the next level.

Depending on the content type, shows:

<table>
<thead>
<tr>
<th>Content type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASSEMBLY</td>
<td>The assembly mainpart, project, phase or drawing name.</td>
</tr>
<tr>
<td>BOLT</td>
<td>Bolt name from the bolt catalog. Nut, washer, phase, or project name.</td>
</tr>
<tr>
<td>CAST UNIT</td>
<td>Project, mainpart, phase or drawing name</td>
</tr>
<tr>
<td>CONNECTION</td>
<td>The connection name that appears in the title bar of the corresponding connection properties dialog box. Project name.</td>
</tr>
<tr>
<td>DRAWING</td>
<td>The entire drawing name, including the drawing type (A, W, C, G, M). Project name.</td>
</tr>
<tr>
<td>HOLE</td>
<td>Bolt, nut, washer, phase, or project name.</td>
</tr>
<tr>
<td>MESH</td>
<td>The mesh name, or project name.</td>
</tr>
<tr>
<td>NUT</td>
<td>The nut name, or bolt, washer, project or phase name.</td>
</tr>
<tr>
<td>Content type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>PART</td>
<td>Name entered in the part properties dialog box for parts. Phase, assembly main part, drawing or project name.</td>
</tr>
<tr>
<td>REBAR</td>
<td>The reinforcing bar name. Phase or project name.</td>
</tr>
<tr>
<td>STUD</td>
<td>The stud name. Project or phase name.</td>
</tr>
<tr>
<td>SURFACING</td>
<td>Surface treatment name defined in the <code>product_finishes.dat</code> file. Project name.</td>
</tr>
<tr>
<td>WASHER</td>
<td>The washer name from the bolt catalog. Bolt, nut, project or phase name.</td>
</tr>
</tbody>
</table>

**NAME_BASE**
Shows the drawing name.

**NEUTRAL_AXIS_LOCATION_ELASTIC_X**
Shows the location of elastic neutral axis.

See also
PROFILE (page 76)

**NEUTRAL_AXIS_LOCATION_ELASTIC_Y**
Shows the location of elastic neutral axis.

See also
PROFILE (page 76)
**NEUTRAL_AXIS_LOCATION_PLASTIC_X**
Shows the location of plastic neutral axis.

*See also*
PROFILE (page 76)

**NEUTRAL_AXIS_LOCATION_PLASTIC_Y**
Shows the location of plastic neutral axis.

*See also*
PROFILE (page 76)

**NORMALIZED_WARPING_CONSTANT**
Shows the warping constant of a profile.

*See also*
PROFILE (page 76)

**NUMBER, NUMBER#1, NUMBER #2**

NUMBER shows the revision number in Rev. No box in the Revision Handling dialog box.

NUMBER#1 shows the total number of objects on a list. Shows the total number of parts and bolts for one assembly for list types ASSEMBLY, ASSEMBLY_BOLT, ASSEMBLY_PART and ASSEMBLY_ALL, if the object is part of an assembly on the list.

NUMBER#2 shows the project number as text.

**NUMBER_IN_PHASE(X)**

Returns the quantity of assemblies in phase X. The result is the same as the NUMBER template attribute but by phase.

You can also use the template attribute PHASE and the function GetValue instead of a number in the template attribute.
Example

GetValue("NUMBER_IN_PHASE(GetValue("PHASE")))")

**NUMBER_OF_TILE_TYPES**

Returns the number of tiles in a tile pattern. For example, the Basketweave pattern is made up of eight tiles, so the template attribute returns 8 for a tile surface treatment whose pattern type is Basketweave.

See also

**NUMBER_VISIBLE**

When added in the reinforcing bar group mark, shows the number of visible reinforcing bars in the view. This is a context-specific template attribute.

1.13  O

**OBJECT**

The object field in the Project properties in File menu --> Project properties.

**OBJECT_DESCRIPTION**

Shows the object type and ID. Below examples:

- PART 780*380 Id: 227
- ASSEMBLY Id: 144
- MESH Id: 946

Note that object IDs are temporary, and may change when you reopen a model, or use the read in command in Tekla Model Sharing, for example.
**OBJECT_LOCKED**

Shows the status of the user-defined attribute **Locked**.

**See also**

ASSEMBLY.OBJECT_LOCKED (page 17)
ASSEMBLY.OWNER_ORGANIZATION (page 17)
ASSEMBLY.LOCK_PERMISSION (page 16)

**ORIGIN_X, ORIGIN_Y, ORIGIN_Z**

It is possible to inquire the global coordinates of a connection's origin through templates. The fields are named **ORIGIN_X**, **ORIGIN_Y** and **ORIGIN_Z**.
**OBJECT_TYPE**
The type of object. The message files contain the translations of these strings (numbers 576 - 587).
The object types are:
- POINT
- PART
- JOINT
- FITTING
- SCREW
- ANTI-MATERIAL
- CUT
- WELDING
- ASSEMBLY
- DRAWING
- PROJECT
- OBJECT

**OWNER**
Shows the object owner in format domain/user.

1.14 P

**PAGE**
The current page number.

**PART_POS**
The position number of parts. Shows a blank cell for all other objects.
Shows the mark of assembly main part for assemblies, parts, and bolts. For all other objects the field is blank.
**PART_PREFIX**
Shows the part prefix, defined in the part properties dialog box.
For more information on numbering series, see .

**PART_SERIAL_NUMBER**
Shows the part number without the prefix and separator.

**PART_START_NUMBER**
Shows the part start number.
See also

**PCS**
Shows the number of bars in a reinforcing bar group.

**PERIMETER**
The template attribute `PERIMETER` gives the perimeter of concrete slabs or polygon plates. In Template Editor, the content type of this template attribute is `PART.PERIMETER`. It can be used both in textual templates and in graphical templates.
`PERIMETER` can also be used for calculating formwork area, and for take-offs.

**PHASE**
The number of the phase to which the object belongs.
To show the phase name, use the `PHASE.NAME` field.
PLASTIC_MODULUS_X

Shows the plastic modulus of x-x reference axis of a cross section. Also known as the first moment of area.

See also
PROFILE (page 76)

PLASTIC_MODULUS_Y

Shows the plastic modulus of y-y reference axis of a cross section. Also known as the first moment of area.

See also
PROFILE (page 76)

PLATE_DENSITY

Shows the material density of a plate (kg/m3).

PLATE_THICKNESS

Shows the thickness of a plate (mm) if the profile has the Plate thickness property defined in the profile catalog. For example, it works for circular and rectangular hollow sections, and for some CC profiles which do not have separate thicknesses for flanges and web. This attribute does not work for plate profiles, because there is no Plate thickness that you can define in profile properties.

See also
PROFILE (page 76)

PLOTFILE

Shows the name of the drawing plot file. Only for use in drawing tables and drawing reports.

See also
POISSONS_RATIO
Shows the Poisson's ratio (analysis property) of material.

POLAR_RADIUS_OF_GYRATION
Shows the polar radius of gyration (analysis property) of a profile.

See also
PROFILE (page 76)

PRELIM_MARK
Shows the user-defined attribute Prelim mark.
For more information on preliminary marks, see .

PROFILE
Shows the part profile name, or the main part profile name in an assembly or cast unit. You can also show profile attributes in templates and reports:

In the Template editor, open the Select attribute dialog box and select PROFILE.* attributes for the selected content type:
For example, MAINPART.PROFILE.HEIGHT with ASSEMBLY content type, shows the height of the main part profile in the assembly.

**PROFILE_DENSITY**

Shows the profile density of material (kg/m³).

**PROFILE_TYPE**

The profile type of the part. The default types in Tekla Structures conform to DSTV-NC documentation. They are defined (message numbers 588 - 599) in the message file by_number.ail in the folder ..\Tekla Structures \<version>\messages. The table below shows the relationship between
messages, profiles in Tekla Structures, and the DSTV-NC profile types defined in messages.

<table>
<thead>
<tr>
<th>Tekla Structures profiles</th>
<th>Message number</th>
<th>Shows DSTV-NC profile type</th>
</tr>
</thead>
<tbody>
<tr>
<td>I-profiles</td>
<td>588</td>
<td>I</td>
</tr>
<tr>
<td>L-profiles</td>
<td>589</td>
<td>L</td>
</tr>
<tr>
<td>U-profiles</td>
<td>591</td>
<td>U</td>
</tr>
<tr>
<td>Plates</td>
<td>592</td>
<td>B</td>
</tr>
<tr>
<td>Round tubes</td>
<td>593</td>
<td>RO</td>
</tr>
<tr>
<td>Round bars</td>
<td>594</td>
<td>RU</td>
</tr>
<tr>
<td>Rectangular tubes</td>
<td>595</td>
<td>M</td>
</tr>
<tr>
<td>CC-profiles</td>
<td>596</td>
<td>C</td>
</tr>
<tr>
<td>T-profiles</td>
<td>597</td>
<td>T</td>
</tr>
<tr>
<td>Polygon plates</td>
<td>598</td>
<td>B</td>
</tr>
<tr>
<td>Bent plates</td>
<td>599</td>
<td>B</td>
</tr>
<tr>
<td>Z-profiles and all the other types of profile</td>
<td>590</td>
<td>Z</td>
</tr>
</tbody>
</table>

**PROFILE_WEIGHT**

The weight of a part. For profiles Tekla Structures calculates the weight using the weight per unit length and weight/m values in the profile catalog. If the weight/m is not defined in the profile catalog, this field works in the same way as WEIGHT_NET (page 98), but uses the plate density value (Property weight for plates) from the material catalog instead of profile density.

**PROFILE_WEIGHT_NET**

The net weight of a part. For profiles Tekla Structures calculates the weight using the length and weight/m values in the profile catalog. Line cuts do not affect the length value, which is calculated using the fitted centerline. For all other objects this field works in the same way as WEIGHT_NET (page 98).
PROJECT_COMMENT

Shows the value entered in the Project Comment box in the user-defined attributes dialog box of the project in File menu --> Project properties --> User-defined attributes.

PROJECT_USERFIELD_1 ... 8

Shows the value of the user-defined attribute of the project that you can define in the User field 1, User field 2 and so on boxes on the Parameters tab in the user-defined attributes dialog box of the project (File menu --> Project properties --> User-defined attributes).

1.15 R

RADIUS

The Radius value of a curved beam.

RADIUS_OF_GYRATION_X

Shows the radius of gyration x (analysis property) of a profile.

See also
PROFILE (page 76)

RADIUS_OF_GYRATION_Y

Shows the radius of gyration y (analysis property) of a profile.

See also
PROFILE (page 76)
**READY_FOR_ISSUE_BY**

The `READY_FOR_ISSUE_BY` attribute tells who has marked a drawing ready for issuing. This attribute can be used for adding **Drawing list** information about who marked the drawing ready for issuing in drawing reports, which can be checked from the **Ready for issuing by** column.

To include in a report the information whether the drawing has been marked ready for issuing, use the attribute `IS_READY_FOR_ISSUE` (page 61).

**REBAR_MESH_LEFT_OVERHANG_CROSS**

Shows the extensions of the crossing bars over the outermost longitudinal bars on the left.

**REBAR_MESH_LEFT_OVERHANG_LONG**

Shows the extensions of the longitudinal bars over the outermost crossing bars on the left.

**REBAR_MESH_RIGHT_OVERHANG_CROSS**

Shows the extensions of the crossing bars over the outermost longitudinal bars on the left.

**REBAR_MESH_RIGHT_OVERHANG_LONG**

Shows the extensions of the longitudinal bars over the outermost crossing bars on the right.

**REBAR_POS**

Shows the position of reinforcing bars as defined by the `XS_REBAR_POSITION_NUMBER_FORMAT_STRING` advanced option.
REFERENCE_ASSEMBLY

Lists assembly level information on reference models in reports and templates.

The following attributes are bound to the content type in contentattributes_global.lst:

```
// ----------------
// REFERENCE_ASSEMBLY - reference model assembly
// ----------------
REFERENCE_ASSEMBLY = NAME
REFERENCE_ASSEMBLY = BOUNDING_BOX_MIN_X
REFERENCE_ASSEMBLY = BOUNDING_BOX_MIN_Y
REFERENCE_ASSEMBLY = BOUNDING_BOX_MIN_Z
REFERENCE_ASSEMBLY = BOUNDING_BOX_MAX_X
REFERENCE_ASSEMBLY = BOUNDING_BOX_MAX_Y
REFERENCE_ASSEMBLY = BOUNDING_BOX_MAX_Z
// Logical building area attributes
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.ID
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.NAME
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.GUID
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.DEFINITION_NAME
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.HIERARCHY_LEVEL
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.LBA_SITE
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.LBA_BUILDING
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.LBA_SECTION
REFERENCE_ASSEMBLY = LOGICAL_BUILDING_AREA.LBA_STOREY
// Building object types hierarchy
REFERENCE_ASSEMBLY = OBJECT_TYPES.ID
REFERENCE_ASSEMBLY = OBJECT_TYPES.NAME
REFERENCE_ASSEMBLY = OBJECT_TYPES.GUID
REFERENCE_ASSEMBLY = OBJECT_TYPES.DEFINITION_NAME
REFERENCE_ASSEMBLY = OBJECT_TYPES.HIERARCHY_LEVEL
REFERENCE_ASSEMBLY = OBJECT_TYPES.ROOT_DEFINITION_NAME
// Project attributes
REFERENCE_ASSEMBLY = PROJECT_ADDRESS
REFERENCE_ASSEMBLY = PROJECT.BUILDER
REFERENCE_ASSEMBLY = PROJECT.DATE_END
REFERENCE_ASSEMBLY = PROJECT.DATE_START
REFERENCE_ASSEMBLY = PROJECT.DESCRIPTION
REFERENCE_ASSEMBLY = PROJECT.DESIGNER
REFERENCE_ASSEMBLY = PROJECT.INFO1
REFERENCE_ASSEMBLY = PROJECT.INFO2
REFERENCE_ASSEMBLY = PROJECT.MODEL
REFERENCE_ASSEMBLY = PROJECT.NAME
REFERENCE_ASSEMBLY = PROJECT_NUMBER#2
REFERENCE_ASSEMBLY = PROJECT.OBJECT
```

The following user-defined attributes are bound to the content type in contentattributes_userdefined.lst:
REFERENCE_ASSEMBLY = USERDEFINED.subref_description
REFERENCE_ASSEMBLY = USERDEFINED.OBJECT_LOCKED
REFERENCE_ASSEMBLY = USERDEFINED.subref_info_string
REFERENCE_ASSEMBLY = USERDEFINED.subref_logical_name
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].DESIGN_CHECKED_BY
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].DESIGN_COMMENT
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].DESIGN_ASSIGNED_TO
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].DESIGN_CODE
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].PLANS_STATUS
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].DESIGN_CHECK_DATE
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].PLANNED_START_D
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].PLANNED_END_D
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].ACTUAL_START_D
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].ACTUAL_END_D
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].FABRICATION_CODE
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].DELIVERY_NUMBER
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].PACKAGE_NUMBER
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].SHIPMENT_NUMBER
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].FABRICATION_STATUS
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].PLANNED_START_F
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].PLANNED_END_F
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].ACTUAL_START_F
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].ACTUAL_END_F
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].ERECUTION_CODE
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].ERECUTION_COMMENT
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].ERECUTION_STATUS
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].CIP_STATUS
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].PLANNED_START_E
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].PLANNED_END_E
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].ACTUAL_START_E
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].ACTUAL_END_E

See also

REFERENCE_MODEL

Lists reference models in reports.

REFERENCE_MODEL_OBJECT

Lists reference model objects in reports.
ROUNDING_RADIUS, ROUNDING_RADIUS_1 ... 2

Shows different rounding radii of profiles. Below as an example rounding radius 1 and 2 for a specific I profile:

See also

PROFILE (page 76)

ROW_IN_PAGE

Produces an incremental number starting from 1 at the beginning of each new page. Use in reports and templates.

Example

Can be used together with the PAGE field to include page or row information in the drawing template. Set Type to Text and enter the following field definition in the Text field properties:

=\%PAGE\% \%/\% \%ROW\_IN\_PAGE\%

1.16 S

SCALE1...S

Use these fields to show the different scales of drawing views. Decimal values are rounded to the nearest integer. Only for use in drawing tables.

SCHED_FAB_DATE

Shows the value selected in the Fabrication Scheduled field on the Status tab in the user-defined attributes dialog box of the part.
SCREW_HOLE_DIAMETER_X
Shows the length of a screw hole in the x direction (hole diameter + LONG_HOLE_X (page 64)).

SCREW_HOLE_DIAMETER_Y
Shows the length of a screw hole in the y direction (hole diameter + LONG_HOLE_Y (page 64)).

SECTION_MODULUS_X, SECTION_MODULUS_Y
Shows section modulus (analysis property) of a profile.
See also
PROFILE (page 76)

SHAPE
Shows the environment-specific bending type of a reinforcing bar.

SHAPE_INTERNAL
Shows the internal bending type of Tekla Structures for a reinforcing bar, for example, 2_1.
See also

SHEAR_CENTER_LOCATION
Shows the shear center location (analysis property) of a profile.
See also
PROFILE (page 76)
shear1, shear2

Shows the values entered in the **Shear, V** box on the **End codes** tab in the user-defined attributes dialog box of the part. shear1 shows the value in the **Start** box and shear2 in the **End** box.

SHOP_ISSUE

Shows the value selected in the **Plans Actual** field on the **Status** tab in the user-defined attributes dialog box of the part or in the assembly properties dialog box.

SHOPSTATUS

Shows the value selected in the **Fabrication Status** list on the **Status** tab in the user-defined attributes dialog box of the part or in the assembly properties dialog box.

SIMILAR_TO_MAIN_PART

Returns 1 if the position number of the given part is the same as the position number of the main part in the assembly.

To show a main part of an assembly on top of part lists:

1. In the Template Editor, add value field **SIMILAR_TO_MAIN_PART** to **PART** row.
2. Set the **Order** to **Descending** and (if needed) hide the field in output, in the **Value Field Properties** dialog box.
3. Drag the **SIMILAR_TO_MAIN_PART** field to be first in sort order in the **Content browser**.

SITE_WORKSHOP

For bolts this field shows the assembly type information in a string (Site or Shop). The message files (466 and 467) contain translations of these strings.

For studs this field shows the assembly type information in a string (Site or Shop).
SIZE
Shows the size of the drawing (e.g. 210x297). Only for use in drawing templates and drawing reports.

SORT_OF_EQICEW_PER_EQGJ
Shows sqrt(ECw/GJ) analysis property of a profile.

See also
PROFILE (page 76)

SUPPLEMENT_PART_WEIGHT
Shows the weight of supplementary parts. SUPPLEMENT_PART_WEIGHT = the weight of the whole assembly less the weight of the main part.

See also WEIGHT (page 97).

START_X
Shows the coordinates of the creation points of parts.

START_Y
See START_X (page 86).

START_Z
See START_X (page 86).

STATICAL_MOMENT_Qf
Shows the statical moment of the flange.

See also
PROFILE (page 76)
STATICAL_MOMENT_Qw
Shows the statical moment of the web.

See also
PROFILE (page 76)

STIFFENER_DIMENSION
Shows the stiffener dimension of a profile.

See also
STIFFENER_DIMENSION_1 ... 3 (page 87)
PROFILE (page 76)

STIFFENER_DIMENSION_1 ... 3
Shows the stiffener dimensions of a profile. Below f1 is stiffener dimension 1, f2 is stiffener dimension 2, and f3 is stiffener dimension 3 in parametric profile EZ.

See also
PROFILE (page 76)

STRAND_DEBONDED_STRANDS_1...5
Shows a list of debonded strands. Strand numbers are separated by spaces.

STRAND_DEBONDED_STRANDS_1 corresponds to row 1 on the Debonding tab in the Strand Pattern Properties dialog box, STRAND_DEBONDED_STRANDS_2 to row 2, and so on.
**STRAND_DEBOND_LEN_FROM_END_1...5**

Shows the debonding length from the end of the strands. 
*STRAND_DEBOND_LEN_FROM_END_1* corresponds to row 1 on the **Debonding** tab in the **Strand Pattern Properties** dialog box, 
*STRAND_DEBOND_LEN_FROM_END_2* to row 2, and so on.

**STRAND_DEBOND_LEN_FROM_START_1...5**

Shows the debonding length from the start of the strands. 
*STRAND_DEBOND_LEN_FROM_START_1* corresponds to row 1 on the **Debonding** tab in the **Strand Pattern Properties** dialog box, 
*STRAND_DEBOND_LEN_FROM_START_2* to row 2, and so on.

**STRAND_DEBOND_LEN_MIDDLE_TO_END_1...5**

Shows the debonding length from the middle to the end of the strands. 
*STRAND_DEBOND_LEN_MIDDLE_TO_END_1* corresponds to row 1 on the **Debonding** tab in the **Strand Pattern Properties** dialog box, 
*STRAND_DEBOND_LEN_MIDDLE_TO_END_2* to row 2, and so on.

**STRAND_DEBOND_LEN_MIDDLE_TO_START_1...5**

Shows the debonding length from the middle to the start of the strands. 
*STRAND_DEBOND_LEN_MIDDLE_TO_START_1* corresponds to row 1 on the **Debonding** tab in the **Strand Pattern Properties** dialog box, 
*STRAND_DEBOND_LEN_MIDDLE_TO_START_2* to row 2, and so on.

**STRAND_N_PATTERN**

Shows the number of different cross-sections in a strand pattern.

**STRAND_N_STRAND**

Shows the number of strands.
STRAND_POS
Shows the position (prefix and running number) of a strand.

STRAND_PULL_FORCE
Shows the pull force of a strand.

STRAND_UNBONDED
Shows the sequence numbers of debonded strands, separated by spaces or commas.

SUBTYPE
Shows the subtype of a profile.

See also
PROFILE (page 76)

SURFACING_NAME
Shows the name of a surface treatment, for example, Tile surface 1.
Surface treatment codes and names are defined in the product_finishes.dat file.

See also
CODE (page 32)
TANGENT_OF_PRINCIPAL_AXIS_ANGLE
Shows the tangent of principal axis angle (analysis property) of a profile.

See also
PROFILE (page 76)

TEXT1...3
In drawing templates this field shows the text for the last revision. In REVISION lists it also shows the revision history.

THERMAL_DILATATION
Shows the thermal dilatation coefficient of material.

THICKNESS
Shows the thickness of a tile in a tile pattern.

See also

THREAD_IN_MATERIAL
Shows 1 if the thread of the screw can be inside the material to be connected and 0 if not.

TILE_NUMBER
Shows the number of tiles used in surface treatment (approximate value).

TILE_VOLUME
Shows the volume of tiles used in surface treatment, without the mortar volume. See also MORTAR_VOLUME (page 68).
TIME
Shows the current time (hh:mm:ss).

TITLE
Shows the user-defined drawing name. Can also be used for parts and assemblies. For example, you could create a report of assemblies listing which assembly drawings had been created.

TITLE1...3
In reports this field shows the user-defined titles entered in the Report dialog box. In drawing templates this field shows the drawing attributes.

TOP_LEVEL
Shows the top level of a single part, cast unit, assembly, part of a connection or a pour object.
Top level takes the unit and accuracy from MarkDimensionFormat.dim.
You can use this attribute as a user-defined attribute also in part marks and associative notes.

NOTE This attribute returns the value as text, so you cannot use formulae with this attribute. Use TOP_LEVEL_UNFORMATTED (page 92) instead.

TOP_LEVEL_GLOBAL
Shows the top level of a single part, cast unit, assembly, part of a connection or a pour object by global axis. TOP_LEVEL_GLOBAL takes the unit and accuracy from MarkDimensionFormat.dim.
You can use this attribute as a user-defined attribute in part marks and associative notes, and also in reports and templates.
**TOP_LEVEL_GLOBAL_UNFORMATTED**

Shows the top level of a single part, cast unit, assembly, part of a connection or a pour object. TOP_LEVEL_GLOBAL_UNFORMATTED returns the top levels as a length in mm so you can format them and include them into formulas in templates. This attribute gives level information by the global axis.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

**TOP_LEVEL_UNFORMATTED**

Shows the top level of a single part, cast unit, assembly, part of a connection or a pour object. TOP_LEVEL_UNFORMATTED returns the top levels as a length in mm so you can format them and include them into formulas in templates.

You can use this attribute as a user-defined attribute also in part marks and associative notes.

**NOTE** Unlike the TOP_LEVEL attribute, the TOP_LEVEL_UNFORMATTED attribute cannot be formatted through the MarkDimensionFormat.dim file.

**TORSIONAL_CONSTANT**

Shows the torsional constant (analysis property) of a profile.

**See also**

PROFILE (page 76)

**TYPE**

Shows the object type or standard:

<table>
<thead>
<tr>
<th>Content type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BOLT</td>
<td>Shows the bolts standard as it appears in the Bolt assembly catalog dialog box (for example, 7968). For all other objects the field is blank.</td>
</tr>
<tr>
<td>DRAWING</td>
<td>Shows the drawing type: A, W, C, G or M.</td>
</tr>
<tr>
<td>Content type</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>MESH</td>
<td>Shows the mesh standard.</td>
</tr>
<tr>
<td>NUT</td>
<td>Shows the nut standard.</td>
</tr>
<tr>
<td>SURFACING</td>
<td>Surface treatment type in the Surface Treatment Properties dialog box.</td>
</tr>
<tr>
<td>WASHER</td>
<td>Shows the standard of the washer.</td>
</tr>
</tbody>
</table>

**TYPE1**

For bolts, shows the bolt standard and the standard of each possible washer or nut as they appear in the Bolt assembly catalog dialog box (for example, 7968/2041/2041/2041/2067/2067). For objects other than bolts, the field is blank.

See also
- TYPE2 (page 93)
- TYPE3 (page 93)
- TYPE4 (page 94)

**TYPE2**

For bolts, shows 1 for existing and 0 for non-existing washers and nuts (for example, 10011). For objects other than bolts, the field is blank.

See also
- TYPE1 (page 93)
- TYPE3 (page 93)
- TYPE4 (page 94)

**TYPE3**

The same as TYPE2, but shows x for existing and o for non-existing washers and nuts (for example, XooXX). For objects other than bolts, the field is blank.

See also
- TYPE1 (page 93)
- TYPE2 (page 93)
- TYPE4 (page 94)
**TYPE4**

The same as TYPE1, but only shows the standard of the existing bolt elements. For objects other than bolts, the field is blank.

See also

TYPE1 (page 93)  
TYPE2 (page 93)  
TYPE3 (page 93)

---

**1.18 U**

**USAGE**

Shows if a reinforcing bar is a main bar, or a tie or stirrup. The attribute returns Main bar for main bars, and Tie or stirrup for ties and stirrups. If the type of use cannot be defined, the attribute returns a blank value.

See also

USAGE_VALUE (page 94)

---

**USAGE_VALUE**

Shows if a reinforcing bar is a main bar, or a tie or stirrup. The attribute returns 1 for main bars, and 2 for ties and stirrups. If the type of use cannot be defined, the attribute returns 0.

See also

USAGE (page 94)

---

**USER_PHASE**

Shows the value entered in the User Phase box on the Parameters tab in the user-defined attributes dialog box of the part.
USERFIELD_1 ... _8
Shows the value of the user-defined attribute User field 1, User field 2 etc.

See also
For more information on the user-defined attributes in templates and reports, see .
For more information on user-defined attributes, see and .

1.19 V

VOLUME
Shows the object volume, for example, the volume of an assembly or of a cast unit. Takes holes and cuts into account.

VOLUME_GROSS
Shows the object gross volume. Does not take into account holes and cuts.

VOLUME_NET
Shows the object volume taking into account holes and cuts.

VOLUME_NET_ONLY_CONCRETE_PARTS
Shows the volume by the solid of concrete parts in the cast unit. If a part uses a profile where cross section area is defined manually, it is ignored in calculation (cf. VOLUME_ONLY_CONCRETE_PARTS)

VOLUME_ONLY_CONCRETE_PARTS
This attribute gets cast unit volume values only for concrete parts. Reinforcing bars or embeds are not taken into account.
1.20  W

WARPING_CONSTANT
Shows the warping constant (analysis property) of a profile.

See also
PROFILE (page 76)

WARPING_STATICAL_MOMENT
Shows the warping statical moment (analysis property) of a profile.

See also
PROFILE (page 76)

WEB_HEIGHT
See WEB_WIDTH (page 97).

WEB_LENGTH
The gross length of the web of an I profile. Use to show welded profiles as plates.

WEB_THICKNESS
The thickness of the web of an I profile. Use to show welded profiles as plates.

See also
PROFILE (page 76)
WEB_THICKNESS_1, WEB_THICKNESS_2
The additional thickness values of the web of a profile.

See also
PROFILE (page 76)

WEB_WIDTH
The width of the web of an I profile. Use to show welded profiles as plates.

WEIGHT
Shows the weight of the object.

The calculation formula depends on the object type:

- For parts with cross-sections defined in the profile catalog, the weight is calculated from the cross section area in the profile catalog (on the list of Properties on the Analysis tab), length (LENGTH) and density of material (property weight for profiles in the material catalog). The result is the same as calculating WEIGHT_GROSS.

- For other profiles with no cross sections defined (typically parametric profiles), shows the net weight calculated using the profile volume and density of material. Fittings, cuts, weld preparations, and part adds affect volume calculation.

- For parts with surface treatment, shows both the weight of the part and the surface treatment.

- For reinforcement, shows the weight of one bar in the group. WEIGHT_TOTAL shows the weight of all bars in the group.

- For assemblies, shows the sum of the part weights for each assembly.

- For surface treatment, shows the weight of the surface treatment.

- For bolts, shows the weight of the bolt element in the corresponding content type rows:
  - BOLT: shows the weight of the bolt.
  - NUT: shows the weight of the nut.
  - WASHER: shows the weight of the washer.
WEIGHT_GROSS
Shows the gross weight, which is the total weight of material needed to fabricate the part. The calculation formula depends on the part:
• If the part has cross-sections defined in the profile catalog, the weight is calculated from part length (LENGTH), the cross section area in the profile catalog, and the density of material.
• If the part is a folded or contour plate without a cross section area, the weight is calculated from plate overall height, overall length and density of material (property weight for plates in the material catalog).
• For other profiles without cross sections (typically parametric profiles), the gross weight is calculated the same way as the WEIGHT_NET, but cuts are not taken into account and the plate density value is used instead of profile density.
• For assemblies, shows the combined gross weight of parts included in an assembly. For bolts it shows the bolt weight.

WEIGHT_M
Shows the property weight of a profile (defined in the material catalog). For parametric profiles, shows the weight of the profile divided by the length. For standard profiles, shows the Weight per unit length from the Analysis properties in the profile catalog.

WEIGHT_MAX
Shows the maximum weight of a single reinforcing bar or strand in a reinforcing bar group.

WEIGHT_MIN
Shows the minimum weight of a single reinforcing bar or strand in a reinforcing bar group.

WEIGHT_NET
Shows the weight of the fabricated part, assembly or cast unit. The calculation formula depends on the object:
• For parts, returns the net weight, which is the actual weight of the fabricated part. Rounding of the profile corners are not taken into account.
• For bolts, returns the bolt weight, and for other objects a zero.
• For assemblies, returns the sum of part weights.

The calculation is based on part volume and density of material. The density value used in the calculation depends on the profile cross-sections:

• If cross-sections are defined in the profile catalog, density is the value of Property: Profile Density in the material catalog.
• If there are no cross-sections, density is the value of Property: Plate Density in the material catalog.

**NOTE**  For parts, the net weight is not the actual weight of the fabricated parts. The profile cross section is calculated using straight angles, so the roundings in the corners are not taken into account (unless you are using the advanced option XS_SOLID_USE_HIGHER_ACCURACY). This causes significant difference between the calculated and the actual weight especially when big cross sections are used.

**WEIGHT_NET_ONLY_CONCRETE_PARTS**

Shows the weight of a cast unit. It calculates the weight by the solid of the concrete parts in the cast unit. If a part uses a profile where cross section area is defined manually, it is ignored in calculation (cf. WEIGHT_ONLY_CONCRETE_PARTS).

**WEIGHT_ONLY_CONCRETE_PARTS**

This attribute gets the cast unit weight only for concrete parts only.
WEIGHT_PER_UNIT_LENGTH
Shows the weight per unit length (analysis property) of a profile.

See also
PROFILE (page 76)

WEIGHT_TOTAL
Shows the total weight of all reinforcing bars or of all strands in a reinforcing bar group. This template attribute is available in content type REBAR in graphical and textual templates.

WELD_ACTUAL_LENGTH1, WELD_ACTUAL_LENGTH2
Shows the actual weld length in the model, or the sum of actual weld lengths, for welds above and below line.
The actual weld length is the distance between the weld seam start point and end point along the weld seam.

See also
WELD_LENGTH1 ... 2 (page 103)

WELD_ANGLE1, WELD_ANGLE2
Shows weld angle for welds above and below line.

WELD_ASSEMBLYTYPE
Shows the assembly type of a weld (Site or Shop). Only use in welding lists.

WELD_DEFAULT
Shows the default weld size according to the drawing attributes. Only use in drawing tables.
**WELD_CROSSSECTION_AREA1, WELD_CROSSSECTION_AREA2**

Shows the theoretical cross section area for welds above and below line. For unsupported weld types, shows 0.00.

**WELD_EDGE_AROUND**

Returns the value selected in the Edge/Around list in the Weld Properties dialog box: Edge if only one edge of a face is welded and Around if the entire perimeter is welded.

**WELD_EFFECTIVE_THROAT, WELD_EFFECTIVE_THROAT2**

Returns the value entered in the Effective throat box in the Weld Properties dialog box. WELD_EFFECTIVE_THROAT shows the value entered in the Above line section, and WELD_EFFECTIVE_THROAT2 in the Below line section.

**See also**

**WELD_ELECTRODE_CLASSIFICATION**

Shows the weld electrode classification, selected in the Electrode classification list in the Weld properties dialog box.

**See also**

**WELD_ELECTRODE_COEFFICIENT**

Shows the value entered in the Electrode coefficient box in the Weld properties dialog box.

**See also**
**WELD_ELECTRODE_STRENGTH**
Shows the value entered in the *Electrode strength* box in the *Weld properties* dialog box.

See also

**WELD_ERRORLIST**
Shows error codes for a weld if there are issues related to the weld.

The error codes are:

<table>
<thead>
<tr>
<th>Error code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1</td>
<td>Weld is not in the correct location.</td>
</tr>
<tr>
<td>E2</td>
<td>Welded parts are not touching each other.</td>
</tr>
<tr>
<td>E3</td>
<td>Weld is not on the edge of a part.</td>
</tr>
<tr>
<td>E4</td>
<td>Weld has a cross section type that is not supported.</td>
</tr>
<tr>
<td>E5</td>
<td>Weld properties are incorrect.</td>
</tr>
<tr>
<td>E6</td>
<td>There are issues related to the weld preparation of parts.</td>
</tr>
</tbody>
</table>

**WELD_FATHER_CODE**
Shows the connection running number of the connection where the weld is located. The field is blank if the weld is not next to a connection. Use only in welding lists.

**WELD_FATHER_NUMBER**
Shows the connection number of the connection where the weld is located. The field is blank if the weld is not next to a connection. Use only in welding lists.

**WELD_FILLTYPE1, WELD_FILLTYPE2**
Shows the weld contour (None, Flush, Convex, Concave) for welds above and below line.
WELD_FINISH1, WELD_FINISH2
Shows the weld finish for welds above and below line.

WELD_INCREMENT_AMOUNT1, WELD_INCREMENT_AMOUNT2
Shows the amount of increments for intermittent welds above and below line.
See also

WELD_INTERMITTENT_TYPE
Shows the shape of a weld (Continuous, Chain intermittent, or Staggered intermittent).
See also

WELD_LENGTH1 ... 2
Shows the weld length value entered in the Length box in the Weld Properties dialog box. WELD_LENGTH1 shows the length of the weld above the line and WELD_LENGTH2 below the line.
See also

WELD_ACTUAL_LENGTH1, WELD_ACTUAL_LENGTH2 (page 100)

WELD_NDT_INSPECTION
Shows the non-destructive testing and inspection level of a weld, selected in the NDT inspection level list in the Weld properties dialog box.
See also
WELD_NUMBER

Shows the weld number.

See also

WELD_PERIOD1 ... 2

Returns the value entered in the Pitch box in the Weld Properties dialog box. WELD_PERIOD1 returns the value entered in the Above line section, and WELD_PERIOD2 in the Below line section.

See also

WELD_POSITION

Returns the weld position, selected in the Position list in the Weld Properties dialog box.

See also

WELD_POSITION_X

Shows the position of the weld in the x axis.

See also

WELD_POSITION_Y

Shows the position of the weld in the y axis.

See also
**WELD_POSITION_Z**

Shows the position of the weld in the z axis.

See also

**WELD_PROCESS_TYPE**

Shows the welding process type of a weld, selected in the Welding process type list in the Weld properties dialog box.

See also

**WELD_ROOT_FACE_THICKNESS, WELD_ROOT_FACE_THICKNESS2**

Shows the root face thickness of a weld above or below line and is used only in welding lists.

**WELD_ROOT_OPENING, WELD_ROOT_OPENING2**

Shows the root opening (space between the welded parts) for welds above and below line.

See also

**WELD_SIZE1, WELD_SIZE2**

Shows weld size for welds above and below line.

**WELD_SIZE_PREFIX_ABOVE**

Returns the weld size prefix, entered in the Prefix box in the Above line section in the Weld Properties dialog box.

See also
**WELD_SIZE_PREFIX_BELOW**

Returns the weld size prefix, entered in the **Prefix** box in the **Below line** section in the **Weld Properties** dialog box.

**See also**

**WELD_TEXT**

Shows the reference text of a weld.

**WELD_TYPE1, WELD_TYPE2**

Shows weld type for above and below line. See the .

**WELD_VOLUME**

Shows the volume of a solid weld object. If the solid weld object fails, shows 0.00. For unsupported weld types, shows 0.00.

**WIDTH**

The width of a part or assembly.

For drawings, shows the width of the drawing.

**See also**

PROFILE (page 76)
**WIDTH_1, WIDTH_2**

Shows special width values of some profiles. Below parametric profile rectangular hollow section with subtype h1*b1-h2*b2*t, where b1 is width 1 and b2 is width 2.

![Diagram of a rectangular hollow section with subtypes](image)

**See also**

PROFILE (page 76)

---

**1.21 X**

**xs_shorten**

Shows the value entered in the **Shorten** box on the **Parameters** tab in the user-defined attributes dialog box of the part.
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