



Tekla Structures 2016

Template attributes reference

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1 Template Attributes Reference Guide

You can use template fields 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.

Descriptions of template attributes are listed in alphabetical order. Expand the table of contents to browse the template attributes.

See also

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

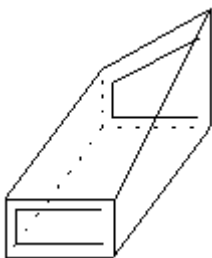
Hard-coded bending type identifiers in reinforcement shape recognition

[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 \(page 43\)](#)

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:



APPROVED_BY

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 \(page 14\)](#)

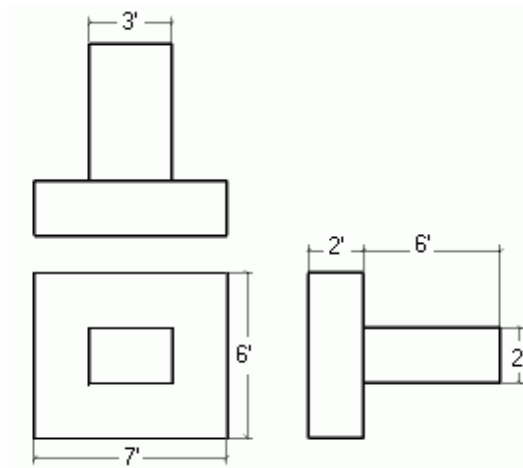
[AREA_NET \(page 14\)](#)

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.



$$\begin{aligned} \text{AREA_FORM_TOP} &= 42 \text{ sq.ft.} \\ \text{AREA_FORM_BOTTOM} &= 42 \text{ sq.ft.} \\ \text{AREA_FORM_SIDE} &= 2*(2*7 + 3*6) \\ &+ 2*(2*6 + 2*6) = 64 + 48 = 112 \text{ sq.ft.} \end{aligned}$$

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:

Attribute	Direction
AREA_PGX	Positive direction of global X-axis
AREA_NGX	Negative direction of global X-axis
AREA_PGY	Positive direction of global Y-axis

Attribute	Direction
AREA_NGY	Negative direction of global Y-axis
AREA_PGZ	Positive direction of global Z-axis
AREA_NGZ	Negative direction of global Z-axis

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:

Attribute	Direction
AREA_PX	Positive direction of local X-axis
AREA_NX	Negative direction of local X-axis
AREA_PY	Positive direction of local Y-axis
AREA_NY	Negative direction of local Y-axis
AREA_PZ	Positive direction of local Z-axis
AREA_NZ	Negative direction of local Z-axis

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 \(page 17\)](#) 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.

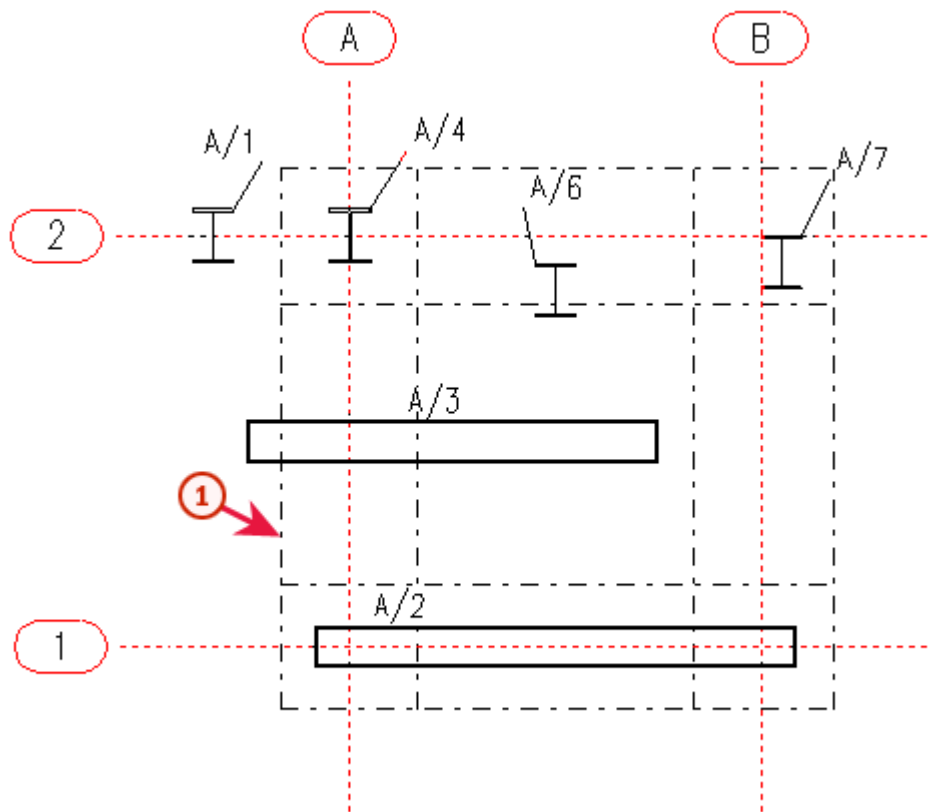
ASSEMBLY_POS

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.

Assembl y	Code
A/1	<A/2
A/2	A-B/1
A/3	<A-B/1-2
A/4	A/2
A/6	A-B/1-2
A/7	B/2



1 TOLERANCE LINE

The position code consists of gridline 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 smallest.

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 \(page 21\)](#) 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_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 \(page 22\)](#)

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 \(page 22\)](#)

BOLT_STANDARD

As for [TYPE \(page 88\)](#).

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 \(page 23\)](#) 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.

BUILDER

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

1.3 C

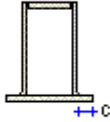
cambering

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 \(page 72\)](#)

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 \(page 18\)](#).

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 18)

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**.

Issue	Lock	Freeze	Master	Up to date	Changes	Created	Modified
						15.10.2009	15.10.2009
						24.05.2007	31.08.2009
						11.06.2009	00.00.0000
						29.06.2009	02.10.2009
					Drawing updated	24.05.2007	02.10.2009
					Parts modified	24.05.2007	23.09.2009
					Drawing updated	24.05.2007	02.10.2009
					Parts modified	24.05.2007	06.08.2009
					Drawing updated	24.05.2007	02.10.2009
					Parts modified	24.05.2007	18.09.2009
					Parts modified	24.05.2007	20.09.2009
						02.10.2009	08.10.2009
						29.09.2009	09.10.2009
						06.10.2009	00.00.0000
					Drawing updated	24.05.2007	06.10.2009

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 \(page 85\)](#)

COG_X, COG_Y, COG_Z

Shows the coordinates of the center of gravity of assemblies, parts, or welds. 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 \(page 72\)](#)

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 \(page 72\)](#)

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 $L*B$, 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)

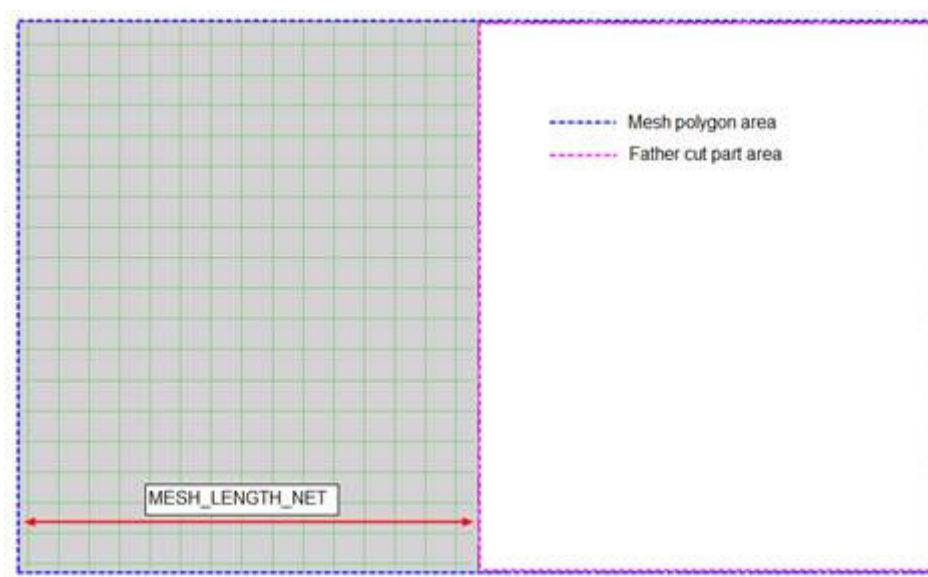
- CUSTOM.MESH_WIDTH_NET (distance)
- CUSTOM.MESH_SIZE_NET (text)

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.

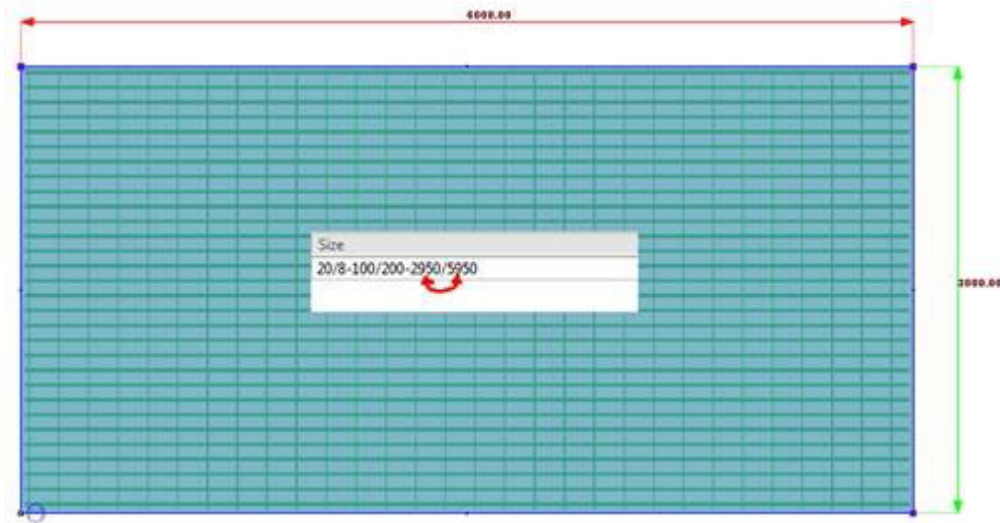
The calculations can be output with custom reports. In Template Editor they are located in the CUSTOM subfolder in the **Attributes** dialog box.

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-**5950/2950** .





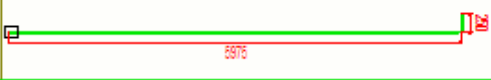
CUSTOM.REBAR_SHAPE_COUPLERS

The `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 **Rebar coupler**, **Rebar end anchor** and **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.

Rebars with couplers			
Pos	Size	Number	Shape
1	12	4	
2	12	4	
3	12	4	

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.

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.

CUSTOM.WALL_xxx

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

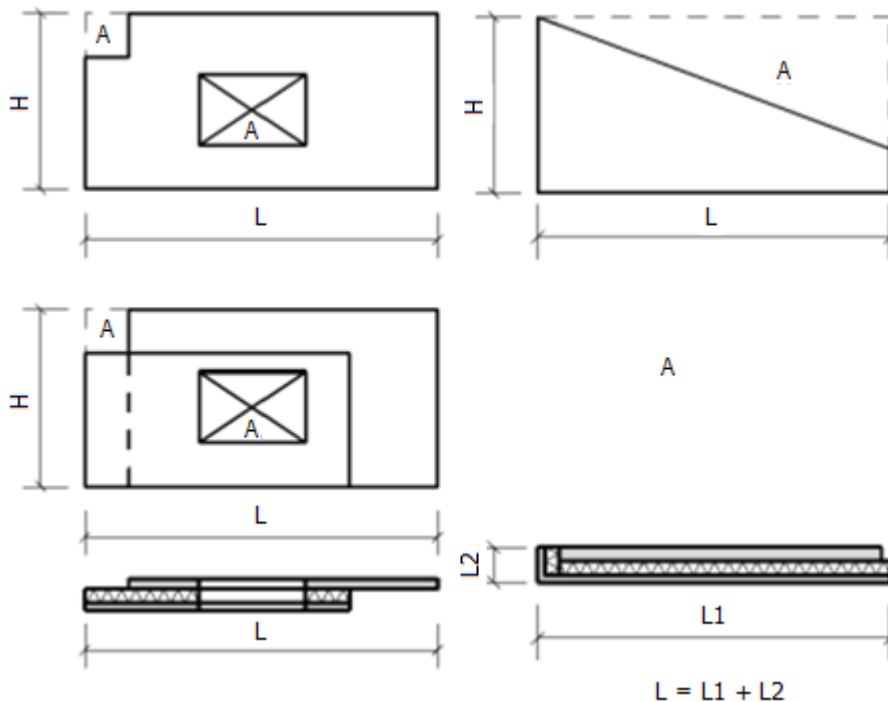
- `CUSTOM.WALL_CORNER_AREA`: This is the façade area of the turning corner in the wall. The turning has to be modeled following the "Modeling guidelines for precast concrete design" in order to get valid corner area values.

- `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.

1.4 D

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:

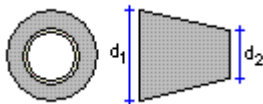
- The diameter of the stud shank.

See also

[PROFILE \(page 72\)](#)

DIAMETER_1, DIAMETER_2

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



See also

[PROFILE \(page 72\)](#)

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 \(page 12\)](#)

DIM_A_MAX ... DIM_G_MAX, DIM_H1_MAX, DIM_H2_MAX, DIM_I_MAX, DIM_J_MAX, DIM_K1_MAX, DIM_K2_MAX, DIM_O_MAX, DIM_R_MAX, DIM_TD_MAX, DIM_X_MAX, DIM_Y_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.

DIM_A_MIN ... DIM_G_MIN, DIM_H1_MIN, DIM_H2_MIN, DIM_I_MIN, DIM_J_MIN, DIM_K1_MIN, DIM_K2_MIN, DIM_O_MIN, DIM_R_MIN, DIM_TD_MIN, DIM_X_MIN, DIM_Y_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.

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.

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:

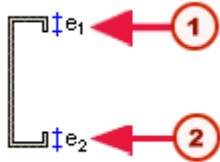


See also

[PROFILE \(page 72\)](#)

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:



① EDGE_FOLD_1

② EDGE_FOLD_2

See also

[PROFILE \(page 72\)](#)

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.

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 \(page 72\)](#)

FLANGE_THICKNESS

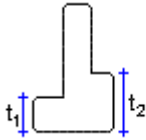
Shows the thickness of a flange.

See also

[PROFILE \(page 72\)](#)

FLANGE_THICKNESS_1, FLANGE_THICKNESS_2

Shows the flange thicknesses of unsymmetrical profiles, such as in unsymmetrical RCDL profile:



See also

[PROFILE \(page 72\)](#)

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 \(page 72\)](#)

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 \(page 72\)](#)

FLANGE_WIDTH

Shows the width of a flange.

See also

[PROFILE \(page 72\)](#)

FLANGE_WIDTH_1, FLANGE_WIDTH_2

Shows the flange widths of unsymmetrical profiles.

See also

[PROFILE \(page 72\)](#)

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 \(page 72\)](#)

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 \(page 72\)](#)

FOLD_ANGLE

Shows the fold angle of a profile.

See also

[PROFILE \(page 72\)](#)

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 holes. The attribute returns 1 if the part contains holes, otherwise it returns 0.

HEAD_DIAMETER

Shows the diameter of the stud head.

HEAD_THICKNESS

Shows the thickness (height) of the stud head.

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:

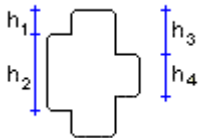
- The height of single-part or assembly drawings. Use in part and assembly lists.

See also

[PROFILE \(page 72\)](#)

HEIGHT_1 ... 4

Shows the height dimensions of unsymmetrical profiles, such as in RCDX profile below:



See also

[PROFILE \(page 72\)](#)

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 an 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.

See also

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 I

ID

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

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

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

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

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

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).

Issue	Lock	Freeze	Master	Up to date	Changes	Created	Modified
						15.10.2009	15.10.2009
						24.05.2007	31.08.2009
						11.06.2009	00.00.0000
						29.06.2009	02.10.2009
					Drawing updated	24.05.2007	02.10.2009
					Parts modified	24.05.2007	23.09.2009
					Drawing updated	24.05.2007	02.10.2009
					Parts modified	24.05.2007	06.08.2009
					Drawing updated	24.05.2007	02.10.2009
					Parts modified	24.05.2007	18.09.2009
					Parts modified	24.05.2007	20.09.2009
						02.10.2009	08.10.2009
						29.09.2009	09.10.2009
						06.10.2009	00.00.0000
					Drawing updated	24.05.2007	06.10.2009

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).

Issue	Lock	Freeze	Master	Up to date	Changes	Created	Modified
						15.10.2009	15.10.2009
						24.05.2007	31.08.2009
						11.06.2009	00.00.0000
						29.06.2009	02.10.2009
					Drawing updated	24.05.2007	02.10.2009
					Parts modified	24.05.2007	23.09.2009
					Drawing updated	24.05.2007	02.10.2009
					Parts modified	24.05.2007	06.08.2009
					Drawing updated	24.05.2007	02.10.2009
					Parts modified	24.05.2007	18.09.2009
					Parts modified	24.05.2007	20.09.2009
						02.10.2009	08.10.2009
						29.09.2009	09.10.2009
						06.10.2009	00.00.0000
					Drawing updated	24.05.2007	06.10.2009













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).

Issue	Lock	Freeze	Master	Up to date	Changes	Created	Modified
						15.10.2009	15.10.2009
						24.05.2007	31.08.2009
						11.06.2009	00.00.0000
						29.06.2009	02.10.2009
					Drawing updated	24.05.2007	02.10.2009
					Parts modified	24.05.2007	23.09.2009
					Drawing updated	24.05.2007	02.10.2009
					Parts modified	24.05.2007	06.08.2009
					Drawing updated	24.05.2007	02.10.2009
					Parts modified	24.05.2007	18.09.2009
					Parts modified	24.05.2007	20.09.2009
						02.10.2009	08.10.2009
						29.09.2009	09.10.2009
						06.10.2009	00.00.0000
					Drawing updated	24.05.2007	06.10.2009

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.

1.10 L

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 one who has locked the drawing has logged in to Tekla account, 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 \(page 43\)](#).

LONG_HOLE_Y

Shows the value from the **Slotted hole Y** field in the **Bolt properties** dialog box. See also [DIAMETER_Y \(page 43\)](#).

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

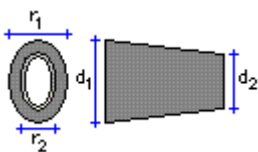
Shows 1 to indicate the main parts of assemblies and 0 for all other objects.
Can be used for sorting.

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 d_1 is the major axis length 1 and d_2 is the major axis length 2 in parametric profile EPD.



See also

[PROFILE \(page 72\)](#)

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:

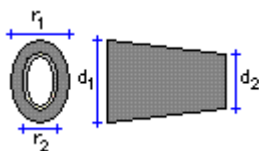
- Steel
- Concrete
- Reinforcing bar
- Timber
- Miscellaneous

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 r_1 is the minor axis length 1 and r_2 is the minor axis length 2 in parametric profile EPD.



See also

[PROFILE \(page 72\)](#)

MODEL

Shows the name of the model.

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 \(page 72\)](#)

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 \(page 72\)](#)

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:

Content type	Description
ASSEMBLY	The assembly mainpart, project, phase or drawing name.
BOLT	Bolt name from the bolt catalog. Nut, washer, phase, or project name.
CAST UNIT	Project, mainpart, phase or drawing name
CONNECTION	The connection name that appears in the title bar of the corresponding connection properties dialog box. Project name.
DRAWING	The entire drawing name, including the drawing type (A, W, C, G, M). Project name.
HOLE	Bolt, nut, washer, phase, or project name.
MESH	The mesh name, or project name.
NUT	The nut name, or bolt, washer, project or phase name.
PART	Name entered in the part properties dialog box for parts. Phase, assembly main part, drawing or project name.
REBAR	The reinforcing bar name. Phase or project name.

Content type	Description
STUD	The stud name. Project or phase name.
SURFACING	Surface treatment name defined in the <code>product_finishes.dat</code> file Project name.
WASHER	The washer name from the bolt catalog. Bolt, nut, project or phase name.

NAME_BASE

Shows the drawing name.

NEUTRAL_AXIS_LOCATION_ELASTIC_X

Shows the location of elastic neutral axis.

See also

[PROFILE \(page 72\)](#)

NEUTRAL_AXIS_LOCATION_ELASTIC_Y

Shows the location of elastic neutral axis.

See also

[PROFILE \(page 72\)](#)

NEUTRAL_AXIS_LOCATION_PLASTIC_X

Shows the location of plastic neutral axis.

See also

[PROFILE \(page 72\)](#)

NEUTRAL_AXIS_LOCATION_PLASTIC_Y

Shows the location of plastic neutral axis.

See also

[PROFILE \(page 72\)](#)

NORMALIZED_WARPING_CONSTANT

Shows the warping constant of a profile.

See also

[PROFILE \(page 72\)](#)

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

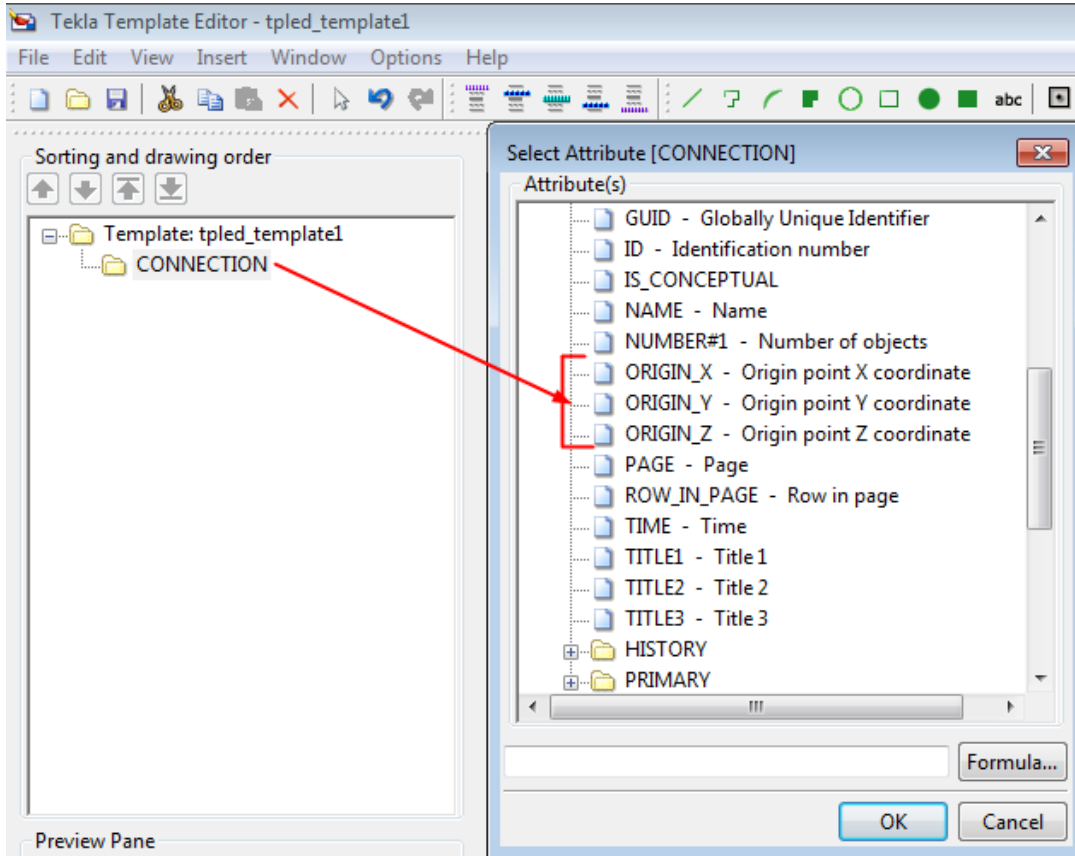
OBJECT_LOCKED

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

For more information on this attribute, see .

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.

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 \(page 72\)](#)

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 \(page 72\)](#)

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 \(page 72\)](#)

[Why does PROFILE.PLATE_THICKNESS not output anything for a plate](#)

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 \(page 72\)](#)

PRELIM_MARK

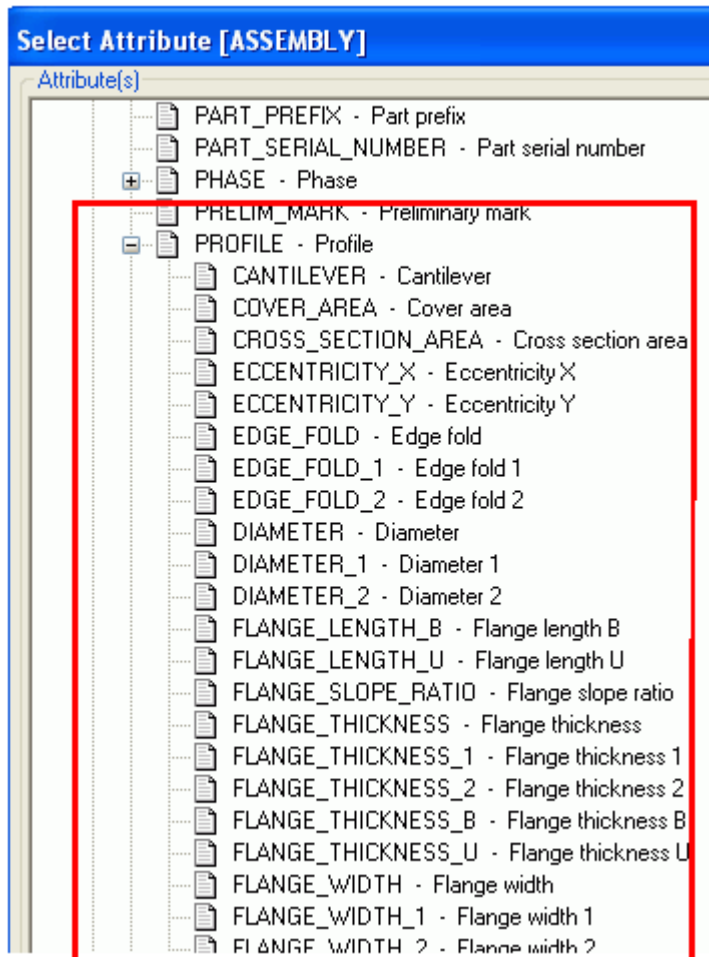
Shows the user-defined attribute **Prelim mark**.

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.

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

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 \(page 94\)](#), 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 \(page 94\)](#).

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 \(page 72\)](#)

RADIUS_OF_GYRATION_Y

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

See also

[PROFILE \(page 72\)](#)

REBAR_MESH_LEFT_OVERHANG_CROSS

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

See also

Creating a customized reinforcement mesh

REBAR_MESH_LEFT_OVERHANG_LONG

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

See also

Creating a customized reinforcement mesh

REBAR_MESH_RIGHT_OVERHANG_CROSS

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

See also

Creating a customized reinforcement mesh

REBAR_MESH_RIGHT_OVERHANG_LONG

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

See also

Creating a customized reinforcement mesh

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.DESCRPTION  
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].ERECTION_CODE
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].ERECTION_COMMENT
REFERENCE_ASSEMBLY = USERDEFINED.[workflow].ERECTION_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.

See also

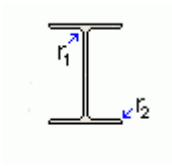
REFERENCE_MODEL_OBJECT

Lists reference models objects in reports.

See also

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 \(page 72\)](#)

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...5

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 \(page 61\)](#)).

SCREW_HOLE_DIAMETER_Y

Shows the length of a screw hole in the y direction (hole diameter + [LONG_HOLE_Y \(page 61\)](#)).

SECTION_MODULUS_X, SECTION_MODULUS_Y

Shows section modulus (analysis property) of a profile.

See also

[PROFILE \(page 72\)](#)

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 \(page 72\)](#)

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_E_x_Cw_PER_G_x_J

Shows $\sqrt{ECw/GJ}$ analysis property of a profile.

See also

[PROFILE \(page 72\)](#)

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 \(page 92\)](#).

START_X

Shows the coordinates of the creation points of parts.

START_Y

See [START_X \(page 82\)](#).

START_Z

See [START_X \(page 82\)](#).

STATICAL_MOMENT_Qf

Shows the statical moment of the flange.

See also

[PROFILE \(page 72\)](#)

STATICAL_MOMENT_Qw

Shows the statical moment of the web.

See also

[PROFILE \(page 72\)](#)

STIFFENER_DIMENSION

Shows the stiffener dimension of a profile.

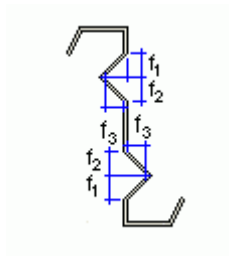
See also

[STIFFENER_DIMENSION_1 ... 3 \(page 83\)](#)

[PROFILE \(page 72\)](#)

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 \(page 72\)](#)

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 \(page 72\)](#)

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 \(page 31\)](#)

1.17 T

TANGENT_OF_PRINCIPAL_AXIS_ANGLE

Shows the tangent of principal axis angle (analysis property) of a profile.

See also

[PROFILE \(page 72\)](#)

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 \(page 64\)](#).

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 \(page 88\)](#) 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 \(page 72\)](#)

TYPE

Shows the object type or standard:

Content type	Description
BOLT	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.
DRAWING	Shows the drawing type: A, W, C, G or M.

Content type	Description
MESH	Shows the mesh standard.
NUT	Shows the nut standard.
SURFACING	Surface treatment type in the Surface Treatment Properties dialog box.
WASHER	Shows the standard of the washer.

TYPE1

For bolts this field shows the bolt type as the type of each possible bolt part that appears in the **Bolt assembly catalog** dialog box (e.g. 7968/2041/2041/2041/2067/2067). For objects other than bolts the field is blank.

TYPE2

For bolts this field shows the bolt type as the numbers of existing bolt parts (e.g. 10021). For objects other than bolts the field is blank.

TYPE3

The same as BOLT_TYPE2, but shows X for existing and o for nonexistent bolt parts (for example, XooXX). For objects other than bolts the field shows a blank.

TYPE4

The same as BOLT_TYPE1 but only the existing components are shown in the string.

1.18 U

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 \(page 72\)](#)

WARPING_STATICAL_MOMENT

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

See also

[PROFILE \(page 72\)](#)

WEB_HEIGHT

See [WEB_WIDTH \(page 92\)](#).

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 \(page 72\)](#)

WEB_THICKNESS_1, WEB_THICKNESS_2

The additional thickness values of the web of a profile.

See also

[PROFILE \(page 72\)](#)

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

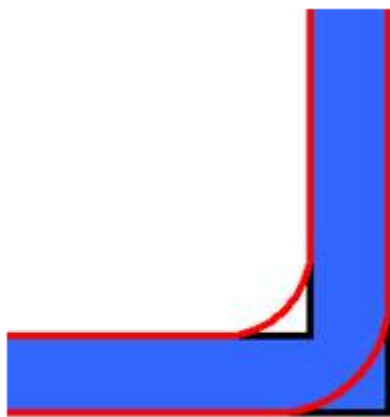
Shows the weight of the fabricated part, assembly or cast unit. The calculation formula depends on the object:

- 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 \(page 72\)](#)

WEIGHT_TOTAL

Shows the total weight of all reinforcing bars or of all strands in a reinforcing bar group.

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 \(page 98\)](#)

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:

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

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 \(page 95\)](#)

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.

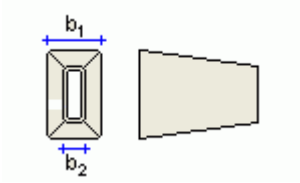
For drawings, shows the width of the drawing.

See also

[PROFILE \(page 72\)](#)

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.



See also

[PROFILE \(page 72\)](#)

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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