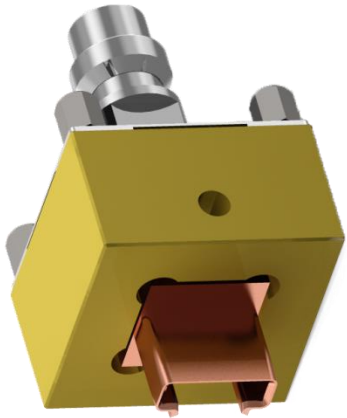


SMARTElectrode

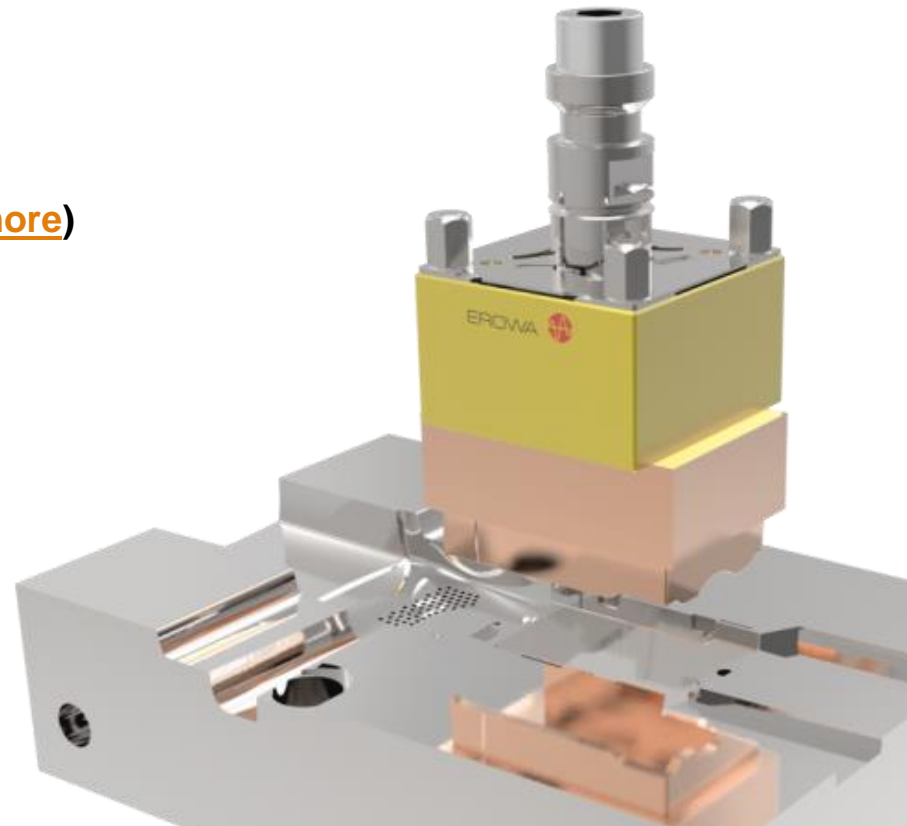
Administration Guide

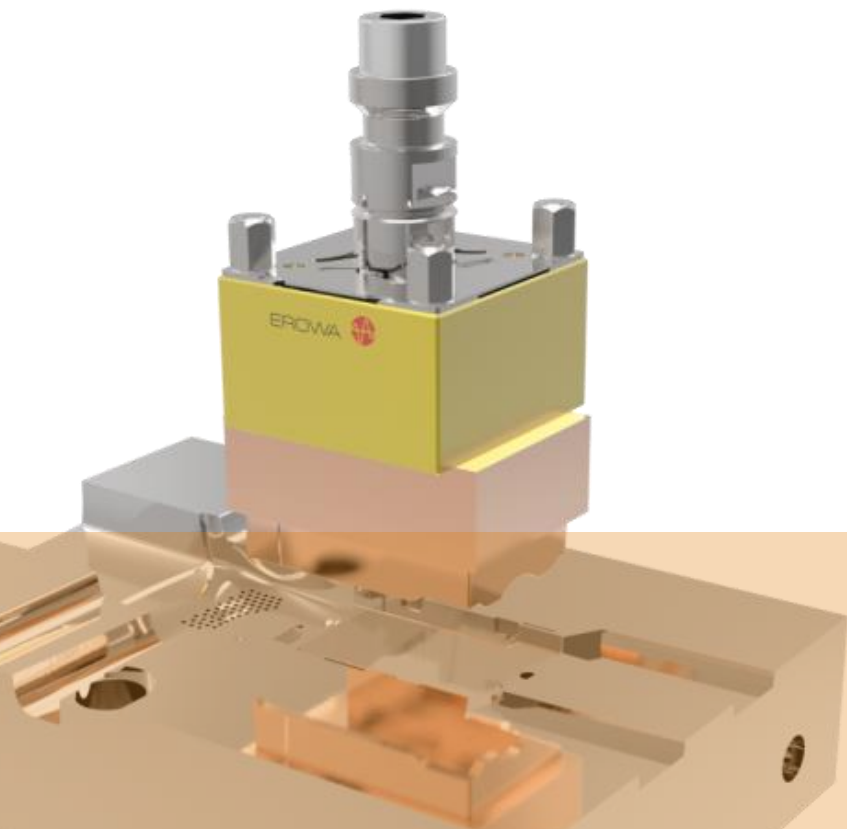
Configuration



SMARTElectrode 8.0
is an auxiliary application for PTC Creo
Parametric that automates the design of
sinking electrodes

- **Recommended Creo Options** ([learn more](#))
- **Dialog Presettings** ([learn more](#))
- **More Options**
 - Naming Formats ([learn more](#))
 - Electrode ([learn more](#))
- **Setup**
 - Parameter Configuration ([learn more](#))
 - Template Data ([learn more](#))
 - Color Format ([learn more](#))
 - Drawings ([learn more](#))
 - Base Group/UDF ([learn more](#))





Creo Options

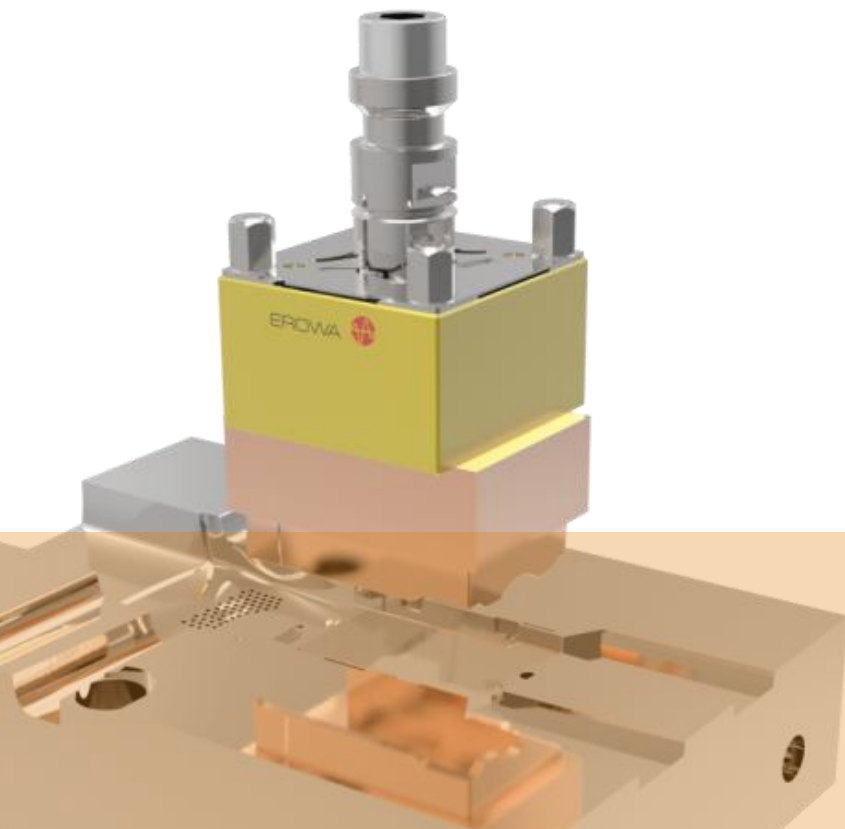
back 

Creo Options

Option	Suggested Value	Description
<i>start_model_dir</i>	<template directory>	Not locked via .sub! To create drawings from configuration\templates
<i>template_designasm</i>	<template path> or <template name>	Project and reference assembly. Whole path or template name.
<i>template_solidpart</i>	<template path> or <template name>	New electrode models. Whole path or template name.
<i>enable_absolute_accuracy</i>	Yes	Some features like merge/cutout need consistent accuracy throughout project.
<i>enable_assembly_accuracy</i>	Yes	
<i>default_abs_accuracy</i>	0.001 (mm)	
<i>accuracy_lower_bound</i>	0.0001 (mm)	
<i>let_proe_rename_pdm_objects</i>	Yes	
<i>show_dim_sign</i>	No	This setting is mandatory!
<i>tol_mode</i>	Nominal	Option name before Creo Parametric.
<i>default_tolerance_mode</i>	Nominal	Option name beginning with Creo.
<i>tol_display</i>	No	

Creo Options

Option	Suggested Value	Description
<i>ignore_model_layer_status</i>	Yes	Drawing detail option.
<i>draw_layer_overrides_model</i>	No	Drawing detail option.
<i>dim_inactive_components</i>	Always/Shaded only/Never	This setting is important to control the display mode when detailing in activated component mode!



Dialog Presetting

back 

Presettings - New Project

REFERENCE_METHOD

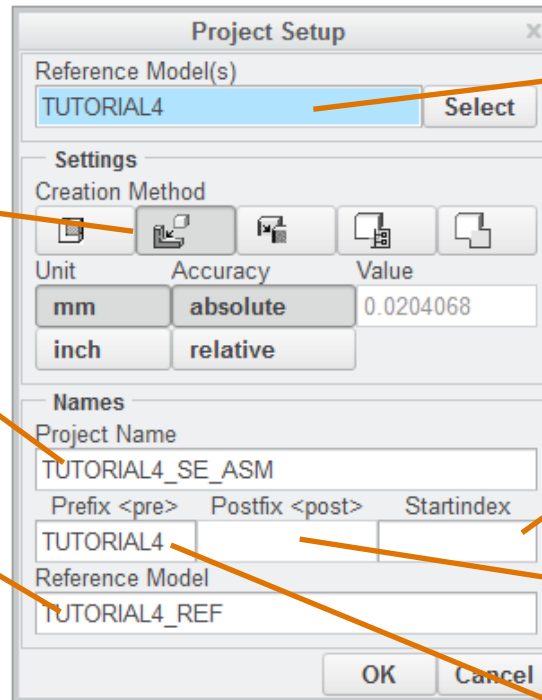
- 0: Use current assembly
- 1: Use original models
- 2: Use copy-geom for reference model
- 3: Use inheritance for reference model
- 4: Use merge for reference model

ASSEMBLY_NAME_FORMAT

default is <core>_SE_ASM

REFMODEL_NAME_FORMAT

default is <core>_REF



The image shows a 'Project Setup' dialog box with the following fields and options:

- Reference Model(s):** A list containing 'TUTORIAL4' with a 'Select' button to its right.
- Settings:**
 - Creation Method:** A row of five icons representing different creation methods.
 - Unit:** A dropdown menu with 'mm' selected and 'inch' as an option below.
 - Accuracy:** A dropdown menu with 'absolute' selected and 'relative' as an option below.
 - Value:** A text input field containing '0.0204068'.
- Names:**
 - Project Name:** A text input field containing 'TUTORIAL4_SE_ASM'.
 - Prefix <pre>:** A text input field containing 'TUTORIAL4'.
 - Postfix <post>:** An empty text input field.
 - Startindex:** An empty text input field.
 - Reference Model:** A text input field containing 'TUTORIAL4_REF'.

At the bottom are 'OK' and 'Cancel' buttons.

Selected object name sets
<core>

Start index for counting:
1 by default

Postfix <post> used for electrode
name format

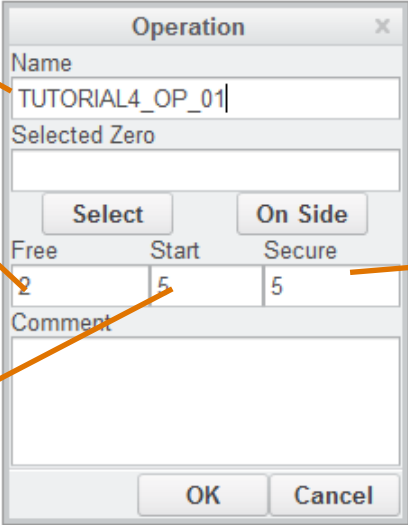
Prefix <pre> used for electrode
name format

Presettings - Operation

OPERATION_NAME_FORMAT
default: <pre>_OP_<2id>

DEFAULT_FREE_DATUM
Z-distance from operation
placement for BASE

DEFAULT_START_DATUM
Z-distance from operation
default start position



Free	Start	Secure
2	5	5

DEFAULT_SECURE_DATUM
Z-distance from default start
defines default secure position

Presettings - Base

The electrode base will be created by adding a UDF (base.gph) to the electrode model. The UDF can be customized if necessary.

[Learn more](#)

Position
A 0.000 B 0.000 C 0.000
X -43.820 Y 50.800 Z -3.599

Blank
Section Rectangular
A_BASE 4.130 B_BASE 2.950
D2 20.000
LENGTH 31.300

Detailing
Chamfers 0 0
FRAME 1.000 0.500
Origin EDM Top

OK Cancel

Template

Suggested template and size depends on [electrode setup options](#) and [data files](#)

Detailing like chamfers and frames depend on existing entries in data files

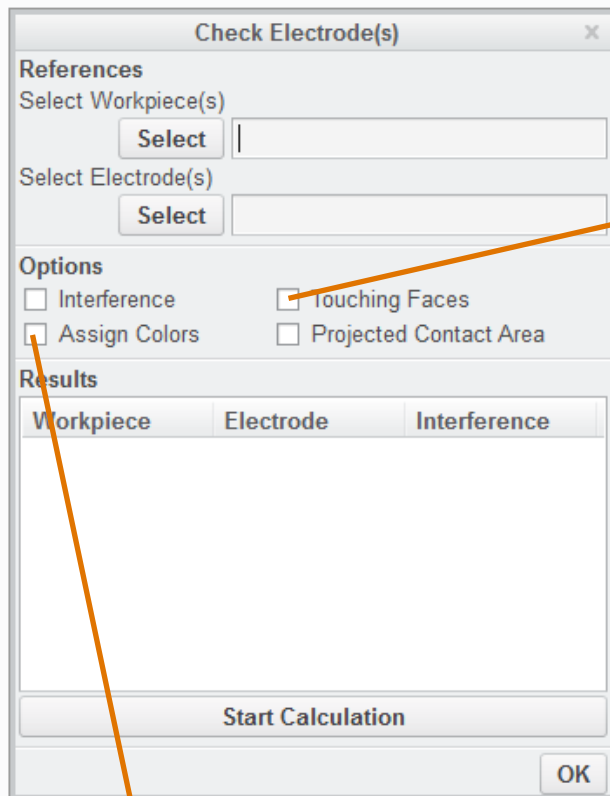
[Learn more](#)

EDM_ORIGIN_POS

Default for position of origin

[Learn more](#)

Presettings - Check



CREATE_TOUCHING_SURFACES_FEATURE

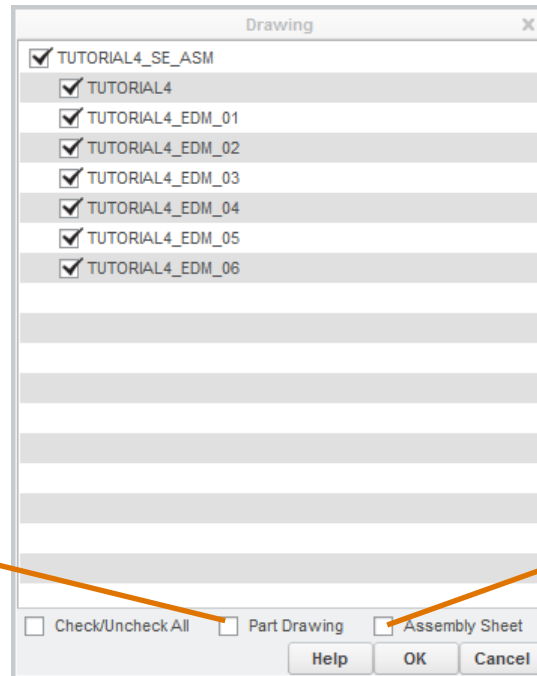
Controls whether the touching surfaces should be created as an import feature or not.

COLOR_FORMAT_FILE

Sets color format for electrodes, features and geometry.

[Learn more](#)

Presettings - Drawings



CREATE_EDM_DRAWING
Drawing of electrode part

ADD_OPERATION_VIEWS

Setup for assembly drawing.

= 0: uncheck box

<>0: check box

0: Don't change assembly drawing.

1: Add a new sheet for each operation.

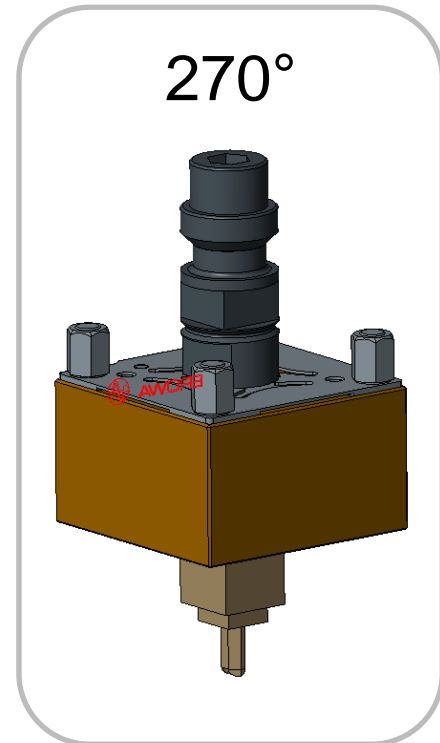
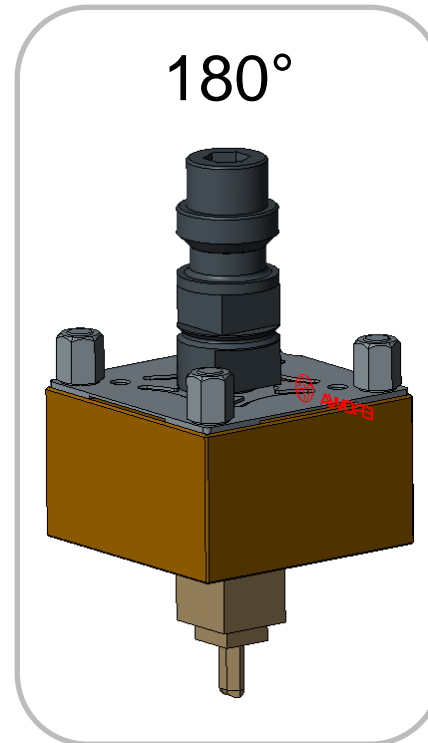
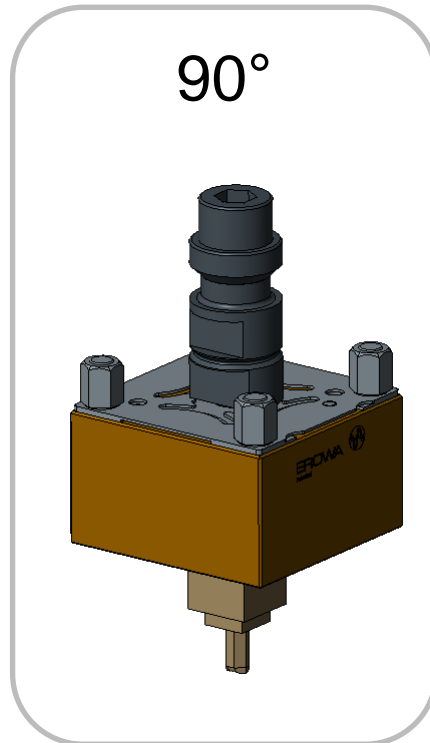
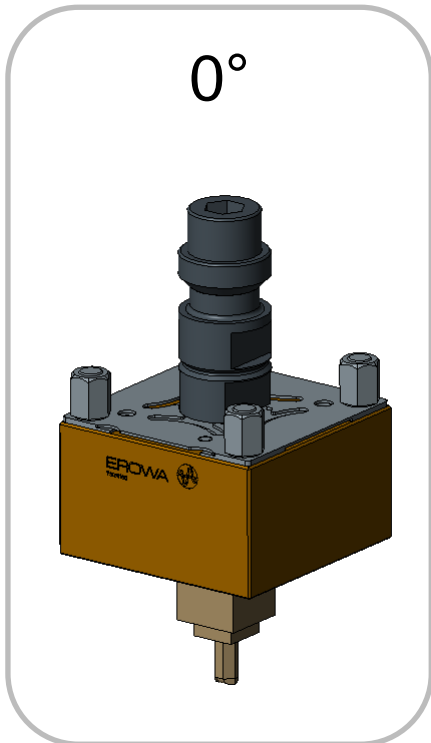
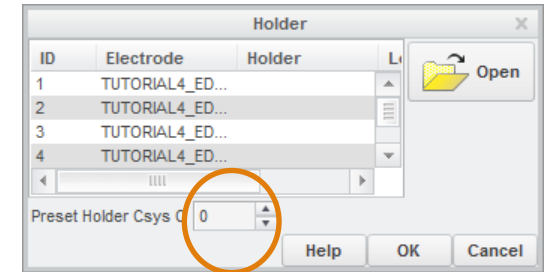
2: Add a new sheet for each electrode

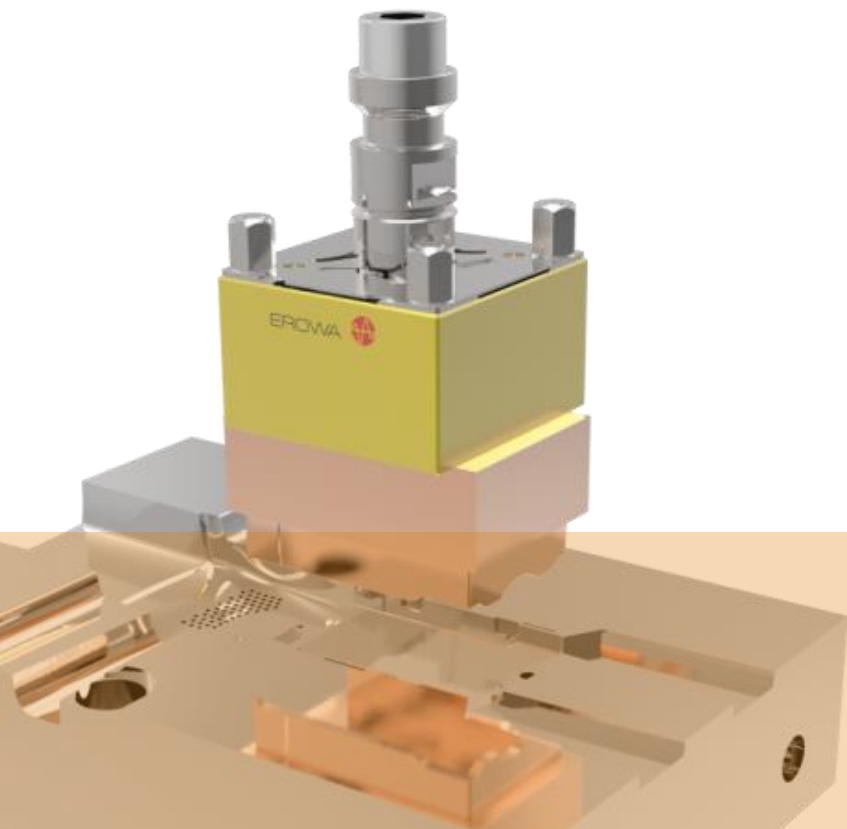
3: Add a new sheet/dims for each operation

4: Add a new sheet for new electrode models

- **HOLDER_CSYS_PRESET**

- defines rotation around Z-axis of electrode for assembling holder.
- Valid presetting values: 0°, 90°, 180°, 270°



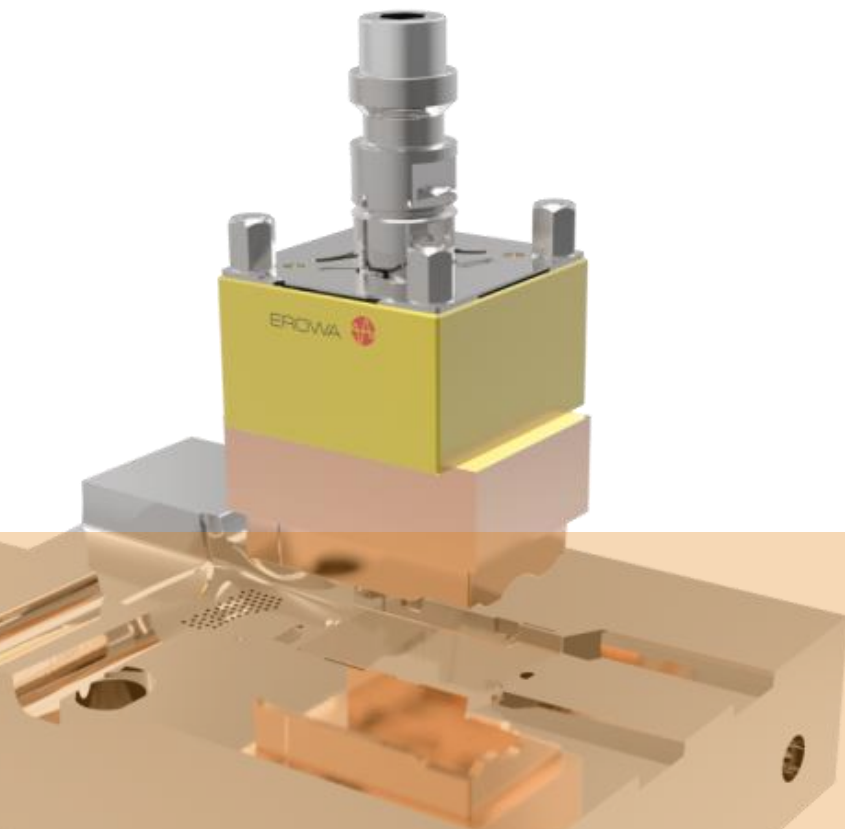


More Options



Naming Format Options

- **ASSEMBLY_NAME_FORMAT**
- **REFMODEL_NAME_FORMAT**
- **OPERATION_NAME_FORMAT**
 - naming format for origin/project zero
 - default: `<pre>_OP_<2id>` = TUTORIAL4_OP_01
- **ELECTRODE_NAME_FORMAT**
 - default: `<pre>_EDM_<2id>` = TUTORIAL4_EDM_01
 - format for counting electrode
 - `<2id>` = 2 digits width (01, 02, ...)
 - `<7id>` = 7 digits width (0000001, 0000002, ...)
 - `<sid>` = count alphabetically (A, B, C, ..., AA, AB, AC, ...)
 - `<pre>` and `<post>` are set in project dialog
 - use `<post>` in naming format to unlock `<post>` in project dialog
- **MFG_NAME_FORMAT**
 - naming format for manufacturing assemblies
 - default: `<pre>_MFG_<2id>` = TUTORIAL4_MFG_01
- **WP_NAME_FORMAT**
 - naming format for manufacturing workpiece
 - default: `<pre>_wp_<2id>` = TUTORIAL4_WP_01
- **USE_NEW_OBJECT_DEFAULT_NAME**
 - use Creo Parametric default name for new objects



Electrode Setup Options

Defaults for

- **Blank**

- **DEFAULT_SUPPLIER**

- Directory name of supplier. For example: default_mm
Complete path: configuration\electrode\default_mm

- **DEFAULT_TYPE**

- File name of data file. For example: rectangular_base
Complete path:
configuration\electrode\default_mm\rectangular_base.dat

- **DEFAULT_MATERIAL**

- File name of material file. For example: CU
Complete path:
configuration\electrode\material\cu.mat

Defaults for

- **Technology**

- **DEFAULT_PROCESSOR**

- Directory name of processor. For example: AGIE

- Complete path: configuration\processor\agie

- **DEFAULT_ORBIT**

- Default undersize/burngap and surface quality data. For example: SPHERIC

- Complete path:

- configuration\processor\agie\processor.cfg –

- “SE_REGISTER_NAME=SPHERIC”

- Sets overburn parameters, quantities and list of surface qualities.

- **Export**

- **DEFAULT_EXPORT**

- Directory name of preselected export. For example: ASCII

- Complete path: configuration\export\ascii

- Saves data of project to text file. Values separated by semicolon.

Electrode Setup Options

Defaults for

- **EDM Csys**

- **EDM_ORIGIN_POS**

- 0: Placed on holder base

- 1: Placed on top surface of base

- 2: Placed on FREE_FACE of base

- 3: Placed on electrode top

- 4: Placed on blank length

- 5: User-defined

- **EDM_ORIGIN_NAME**

- Default: EDM_ORIGIN

- **Csys for CAM**

- **CAM_CSYS_CREATION**

- 0: No additional CSYS for CAM

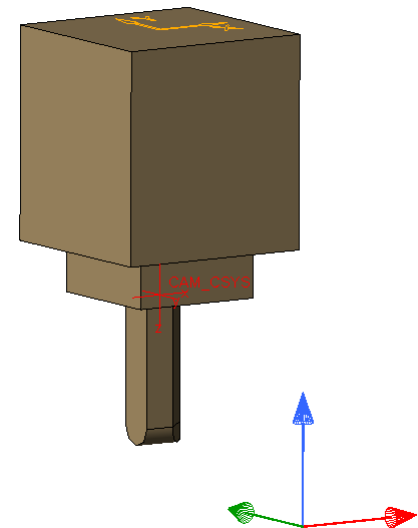
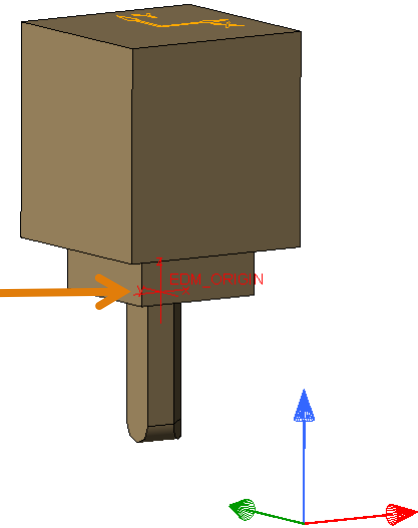
- 1: Additional CSYS for CAM rotated around X-axis ($A=180^\circ$)

- 2: Additional CSYS for CAM rotated around Y-axis ($B=180^\circ$)

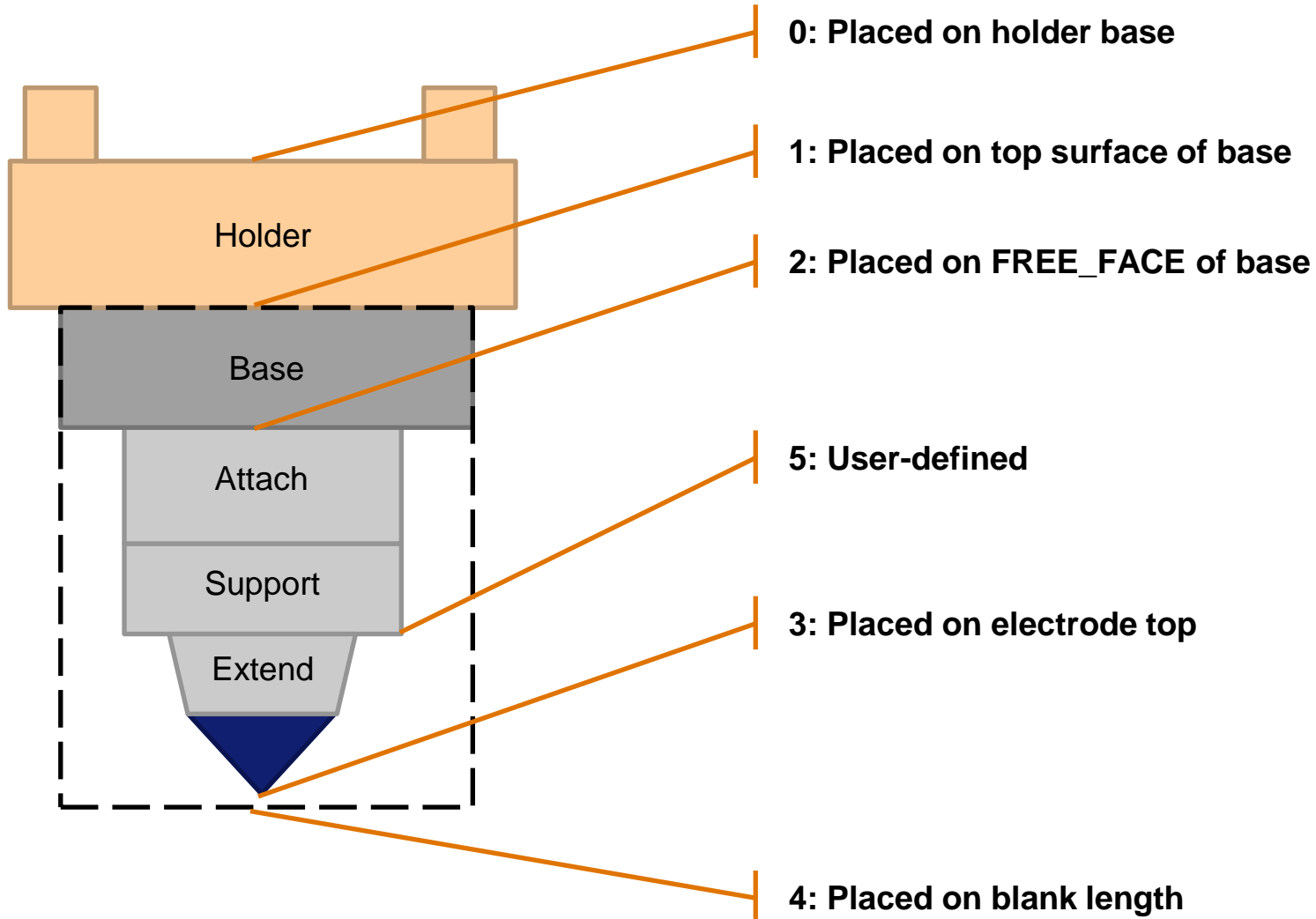
- **CAM_CSYS_NAME**

- Name for CSYS feature

- Default: CAM_CSYS



Electrode Setup Options



Allowance for

- **Size of blank**

SME creates a solid import feature before merge/cutout feature is created. To make sure that the solid overlaps copied surfaces the software increases the bounding box by two values

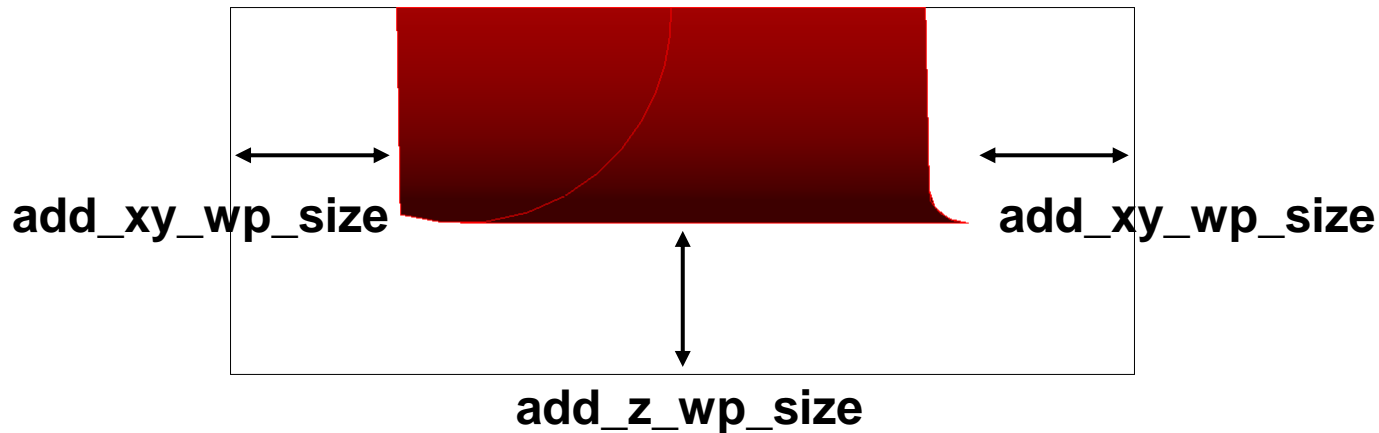
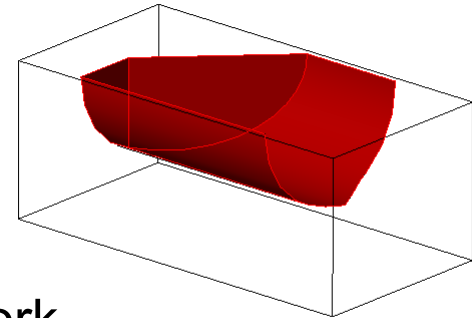
- **ADD_XY_WP_SIZE**

Is added to the X and Y extents of the surfaces.

- **ADD_Z_WP_SIZE**

Is added to the bottom of the surface extents.

It's not added to the top to avoid unnecessary work.



Allowance for

- **Minimum size of base template**

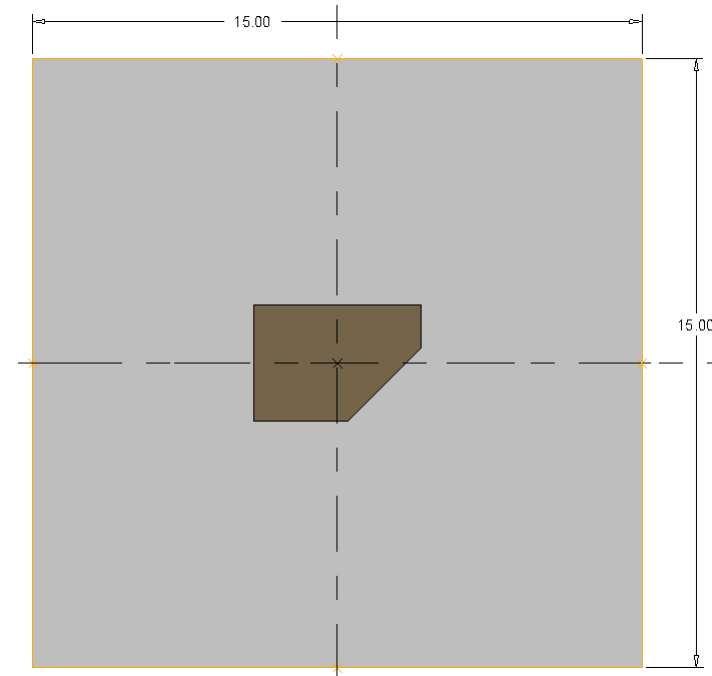
- SME adds `ADD_XY_WP_SIZE` to the X/Y-dimension and rounds up to the next `INCREMENT_SIZE` to calculate base size.
- SME adds `ADD_Z_WP_SIZE` to the Z-dimension and rounds up to the next `INCREMENT_SIZE` to calculate overall blank height.

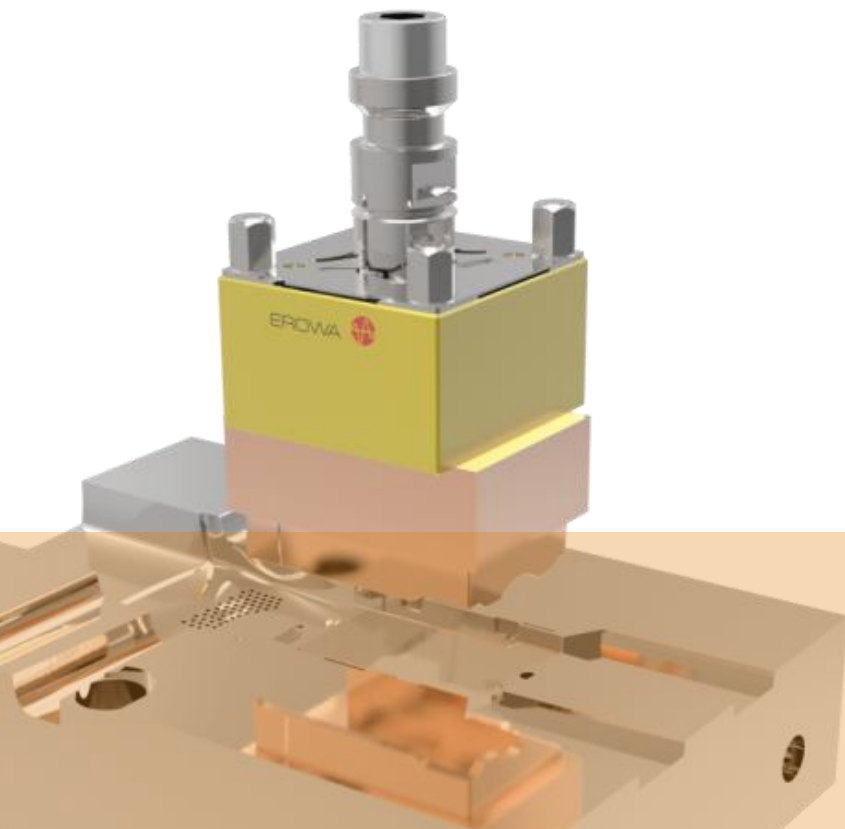
- **Final base size**

- The final base size will be selected from existing `.dat`.

- **Position**

- `INCREMENT_POS`
Is used to round the placement of the base



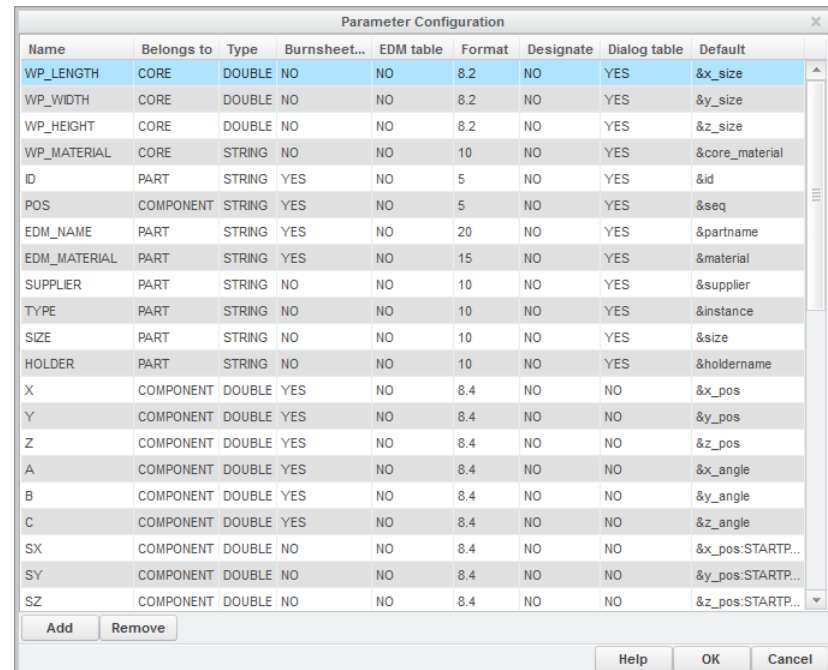


Parameter Configuration

Parameter Configuration

The parameter configuration specifies, what information will be saved to objects!

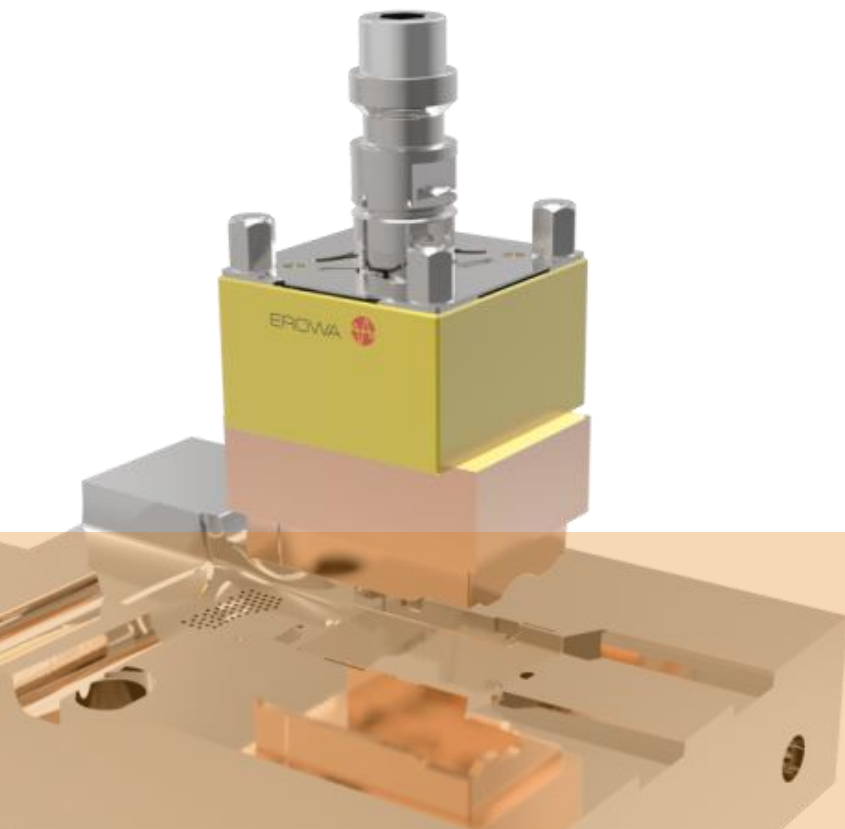
- **Objects**
 - Project/Assembly (Belongs to ,ASSEMBLY‘)
 - Core models/workpieces (Belongs to ,CORE‘)
 - Electrode Part (Belongs to ,PART‘)
 - Electrode Component Feature (Belongs to ,COMPONENT‘)
- **Column ,Burnsheet‘ whether to show the column on drawing or not**
- **Column ,EDM table‘ is not used anymore**
- **,Format‘ defines column width and number of decimal places**
- **,Dialog table‘ sets the behavior for properties dialog**
- **,Default‘ tells SME which information has to be saved to parameter**



Name	Belongs to	Type	Burnsheet...	EDM table	Format	Designate	Dialog table	Default
WP_LENGTH	CORE	DOUBLE	NO	NO	8.2	NO	YES	&x_size
WP_WIDTH	CORE	DOUBLE	NO	NO	8.2	NO	YES	&y_size
WP_HEIGHT	CORE	DOUBLE	NO	NO	8.2	NO	YES	&z_size
WP_MATERIAL	CORE	STRING	NO	NO	10	NO	YES	&core_material
ID	PART	STRING	YES	NO	5	NO	YES	&id
POS	COMPONENT	STRING	YES	NO	5	NO	YES	&seq
EDM_NAME	PART	STRING	YES	NO	20	NO	YES	&partname
EDM_MATERIAL	PART	STRING	YES	NO	15	NO	YES	&material
SUPPLIER	PART	STRING	NO	NO	10	NO	YES	&supplier
TYPE	PART	STRING	NO	NO	10	NO	YES	&instance
SIZE	PART	STRING	NO	NO	10	NO	YES	&size
HOLDER	PART	STRING	NO	NO	10	NO	YES	&holdername
X	COMPONENT	DOUBLE	YES	NO	8.4	NO	NO	&x_pos
Y	COMPONENT	DOUBLE	YES	NO	8.4	NO	NO	&y_pos
Z	COMPONENT	DOUBLE	YES	NO	8.4	NO	NO	&z_pos
A	COMPONENT	DOUBLE	YES	NO	8.4	NO	NO	&x_angle
B	COMPONENT	DOUBLE	YES	NO	8.4	NO	NO	&y_angle
C	COMPONENT	DOUBLE	YES	NO	8.4	NO	NO	&z_angle
SX	COMPONENT	DOUBLE	NO	NO	8.4	NO	NO	&x_pos:STARTP...
SY	COMPONENT	DOUBLE	NO	NO	8.4	NO	NO	&y_pos:STARTP...
SZ	COMPONENT	DOUBLE	NO	NO	8.4	NO	NO	&z_pos:STARTP...

There are some special defaults and functionalities for parameters:

- **Any default value can be set if a default without ,&' is saved**
- **Default ,&locked'**
 - A locked parameter is shown in properties dialog and on drawing
 - A locked parameter won't be changed by SME
 - This can be used for additional part numbers or order information
- **Default ,&inherit'**
 - If a parameter name exists two times (one for ,ASSEMBLY' and one for ,PART' or ,COMPONENT'), the value can be inherited from the assembly to the electrode
 - This can be used to set and change project settings
- **Value from custom list**
 - If the parameter name (column 1) is identical to a list name in sel_list.txt, the value will be selectable from this list



Template Data

[back](#) 

Any template file (.dat) contains a list of sizes and dimensions and is a tab separated file.

- **Column 1 - INSTANCES**

List of available sizes, selected one will be saved as parameter to model

- **Column 2**

A_BASE – X dimension of base

- **Column 3**

B_BASE – Y dimension of base

- **Following columns**

- D2 (Base height)
- LENGTH (Overall length)
- CHAMFER1
- CHAMFER2
- FRAME_HEIGHT
- FRAME_WIDTH
- Parameters (e.g. order number)

TYPE 1				
INSTANCE	A_BASE	B_BASE	LENGTH	D2
15x15x30	15	15	30	20
25x25x30	25	25	30	20
50x10x30	50	10	30	20
50x15x30	50	15	30	20
50x20x30	50	20	30	20
50x30x30	50	30	30	20

Datafile ↔ Template model

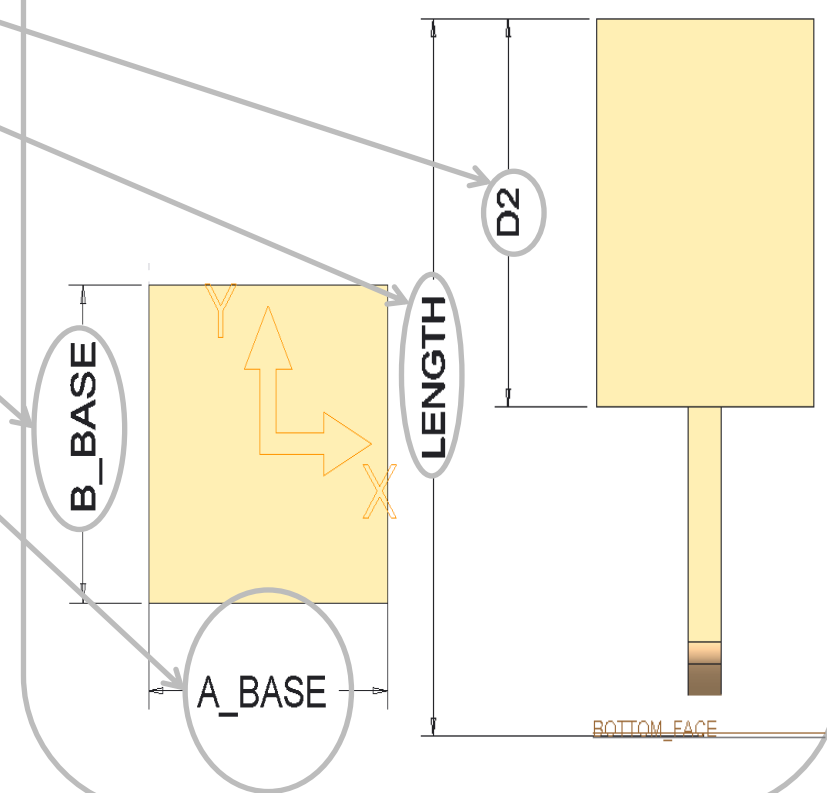
rectangular_base.dat

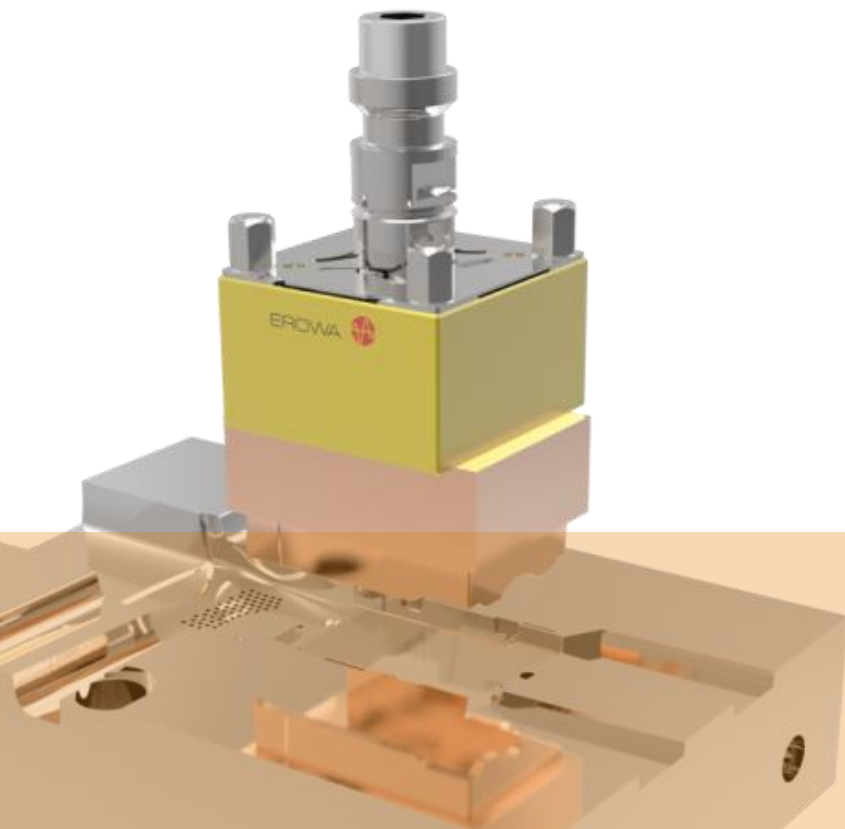
```
TYPE 1
INSTANCE ORDERNO A_BASE B_BASE LENGTH D1 D2
15x15x30 151530 15 15 30 5 20
25x25x30 252530 25 25 30 5 20
50x10x30 501030 50 10 30 5 20
50x15x30 501530 50 15 30 5 20
50x20x30 502030 50 20 30 5 20
50x30x30 503030 50 30 30 5 20
```

parameter.cfg

Name	Belongs To	Type	Burnsheet	EDM	Format	Designate	GUI	Default
ORDERNO	PART	INTEGER	N	N	10	N	Y	.

rectangular_base.prt





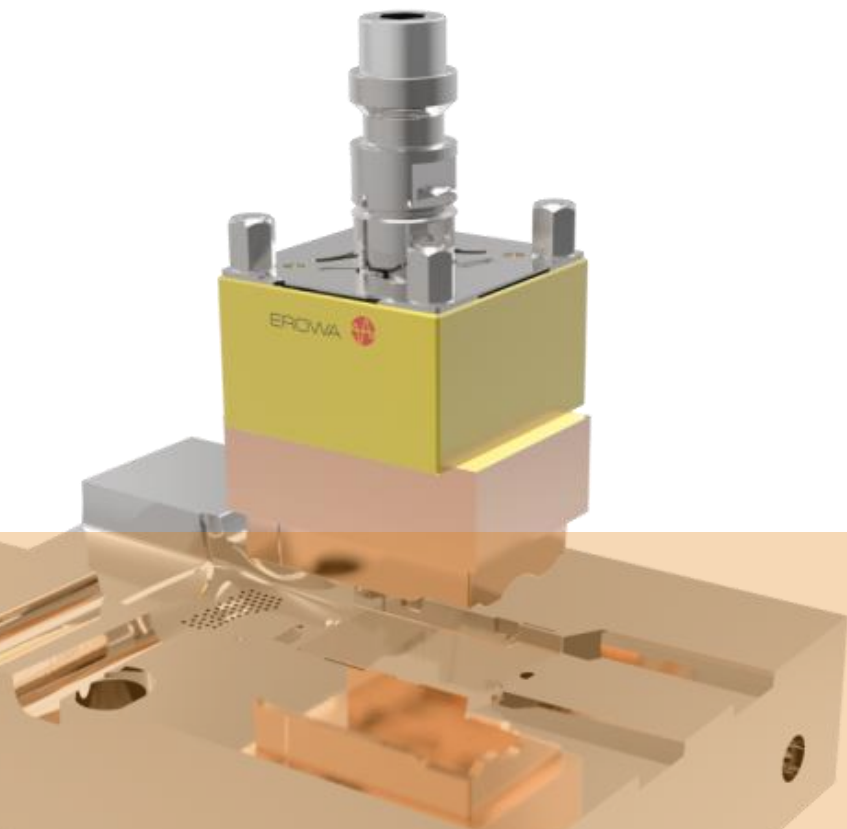
Color Format File

back 

- **Use option COLOR_FORMAT_FILE to set color of**
 - Models
 - Features
 - Surfaces
- **Based on rules**
 - Electrode by Id (1, 2, 3, ...)
 - Feature by name
 - Surface by angle (measured against Z+)
 - Surface by type
 - Analysis results
- **Color code**
 - Red, Green, Blue (0...255)
For example 000,030,255 (dark blue)
 - Transparency (0...1)
0% - 100% Transparency

- **Special Color Rules**
 - COLOR_NOT_MACHINEABLE_FACES
 - COLOR_MACHINEABLE_FACES
 - COLOR_BURNT_FACES
 - COLOR_TOUCHING_SURFACES
 - BASE
 - BASE_TOP
 - -1: default color for electrode model
- **Example color scheme: very light RGB palette**



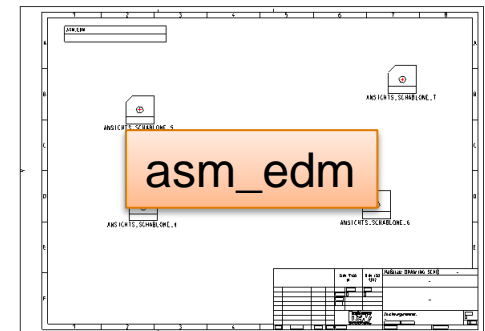
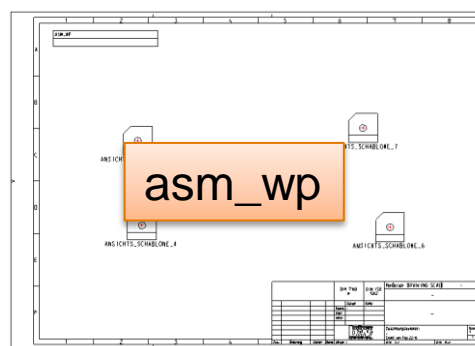
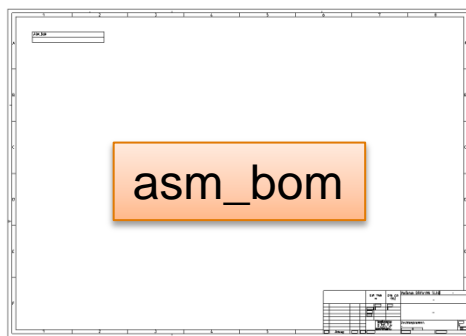
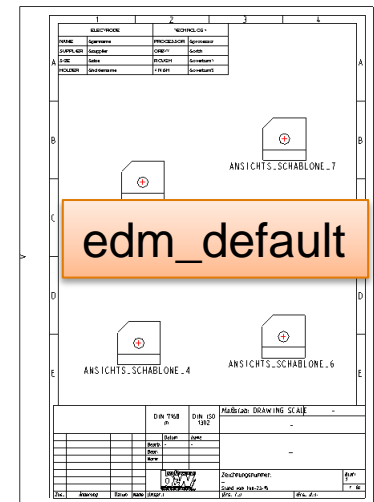


[Drawings](#)

[back](#) 

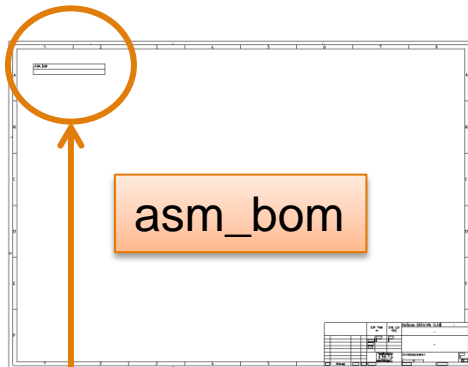
Drawing Templates

- **Drawing templates and table files are located in configuration/templates**
 - asm_bom
Template for assembly drawing sheet 1
 - asm_wp
Template for assembly drawing sheet 2
 - asm_edm
Template for assembly drawing sheets 3...
 - edm_default
Template for electrode part drawing
- **Things to prepare**
 - Set valid detail options (din.dtl, inch.dtl, ...)
 - Set custom formats
 - Set valid view names for orientation

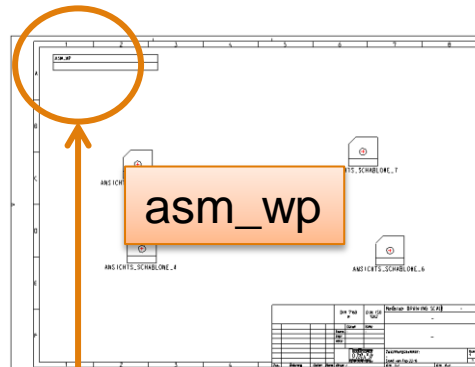


Drawing Templates – Assembly Sheets

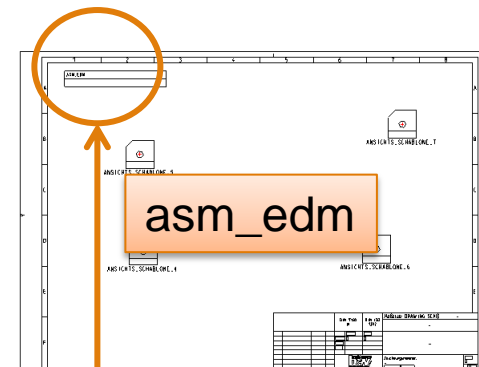
- **Saved table files include repeat regions and replace the placeholders on drawing creation.**
- **The table on sheet 2 (workpieces) is controlled by parameter configuration.**
- **The tables on following sheets (electrodes) are also controlled by parameter configuration.**



Replaced by asm_bom.tbl



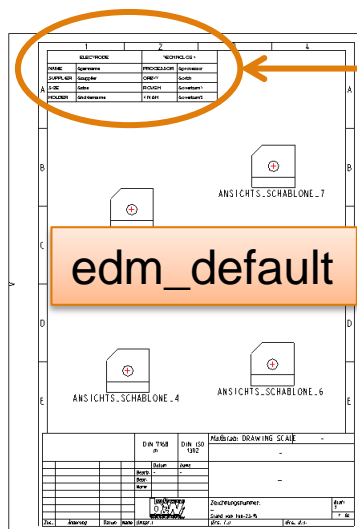
Replaced by asm_wp.tbl



Replaced by asm_edm.tbl

Drawing Templates – Electrode Sheet

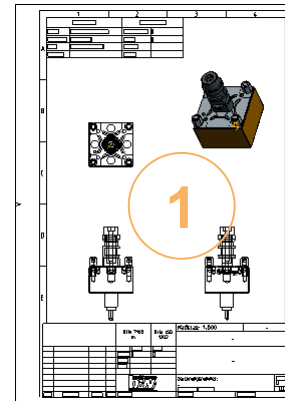
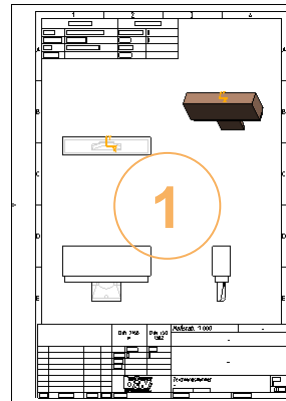
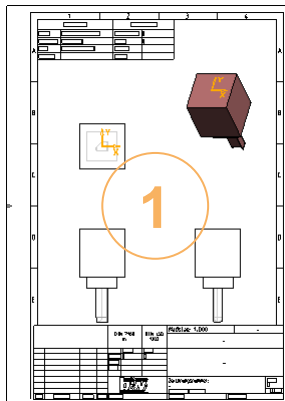
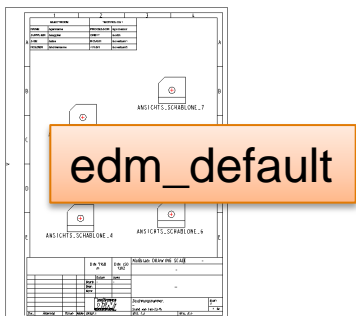
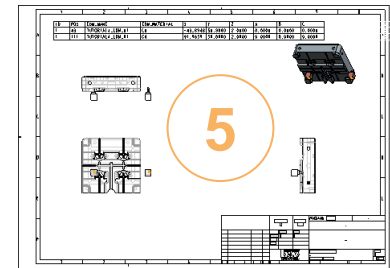
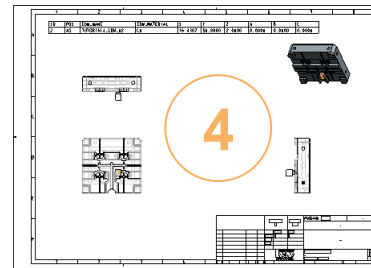
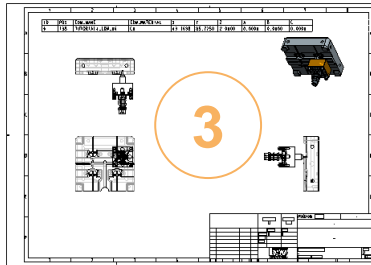
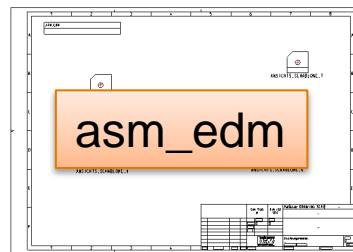
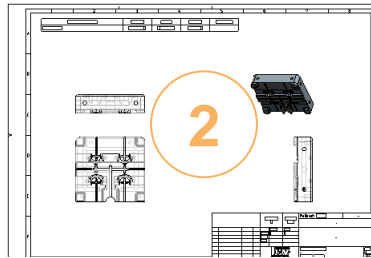
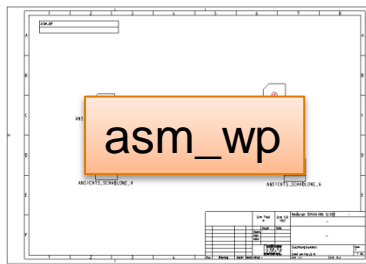
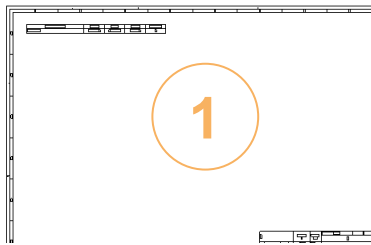
- The Electrode drawing template (edm_default) represents the manufacturing drawing.
- It should be used to show blank data.
- It shouldn't be used to show electrode positions!
- The table can be prepared directly on the drawing. SME replaces the placeholder through parameters.
- Use parameter names or defaults from parameter configuration.
- Learn more about parameter configuration



ELECTRODE		TECHNOLOGY	
NAME	&partname	PROCESSOR	&processor
SUPPLIER	&supplier	ORBIT	&orbit
SIZE	&size	ROUGH	&overburn1
HOLDER	&holdername	FINISH	&overburn3

Drawing Templates – Example Output

Part Drawing Assembly Sheet

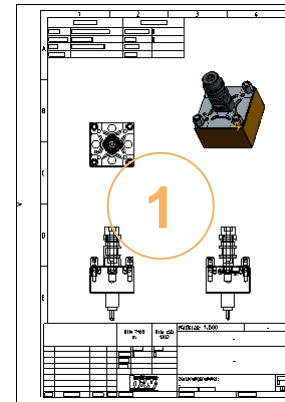
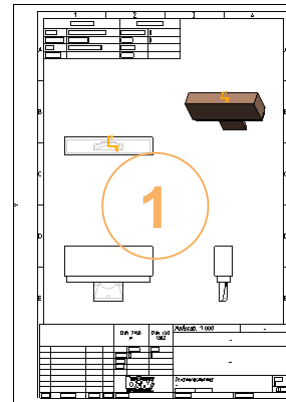
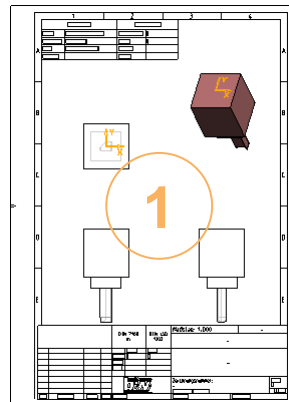
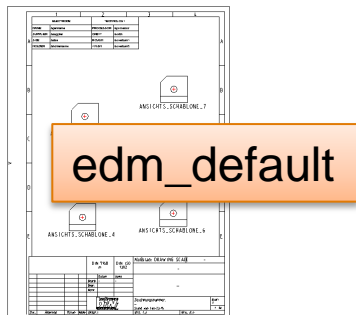
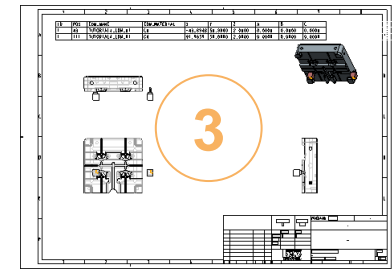
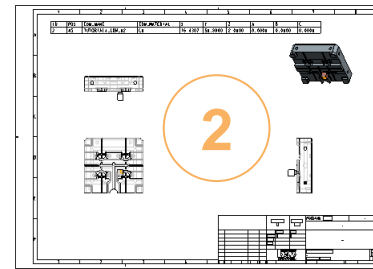
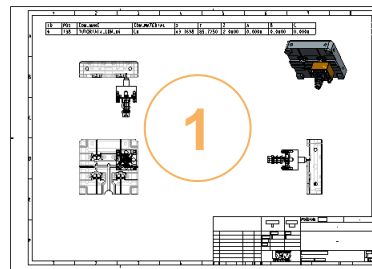
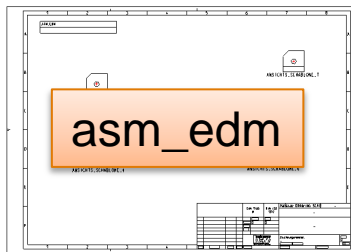
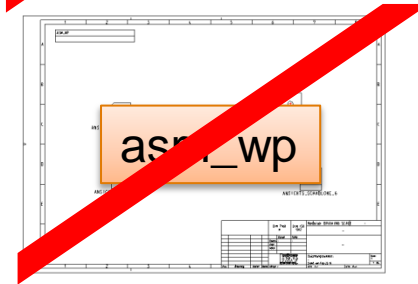
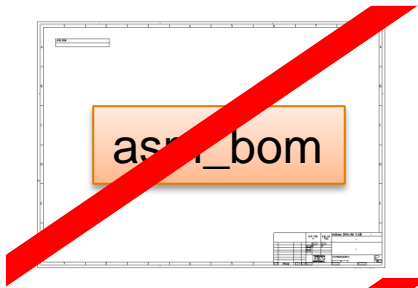


Drawing Options – Optional Sheets

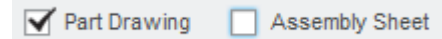
- **The creation of assembly sheets can be controlled by renaming or deleting templates from folder**
- **Next slide shows the output for removed `asm_bom.drw` and `asm_wp.drw`.**

Drawing Options – Optional Sheets

Part Drawing Assembly Sheet



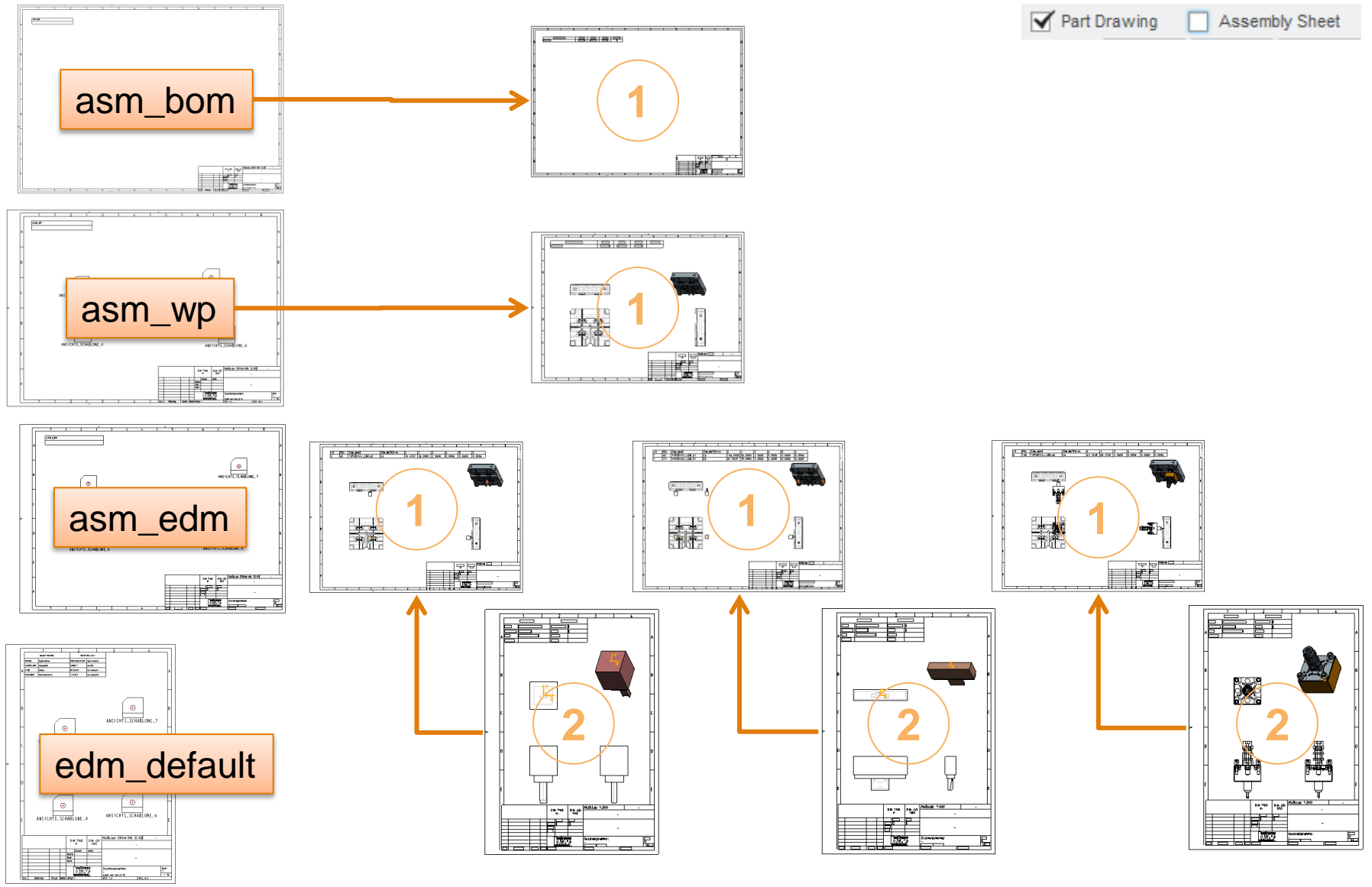
Drawing Options – Part Drawings



- If only ,Part Drawing‘ is activated the software will create individual drawing objects.
- The electrode drawing (edm_default) showing the blank data will be added to the assembly sheet (asm_edm) showing the position data.
- [Learn more](#) about presetting the drawing dialog.

Drawing Options – Part Drawings

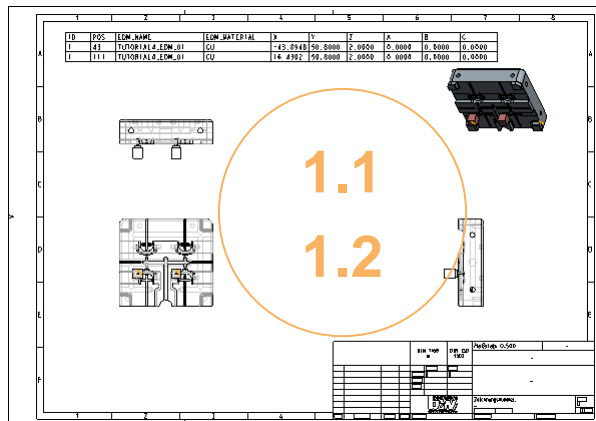
Part Drawing Assembly Sheet



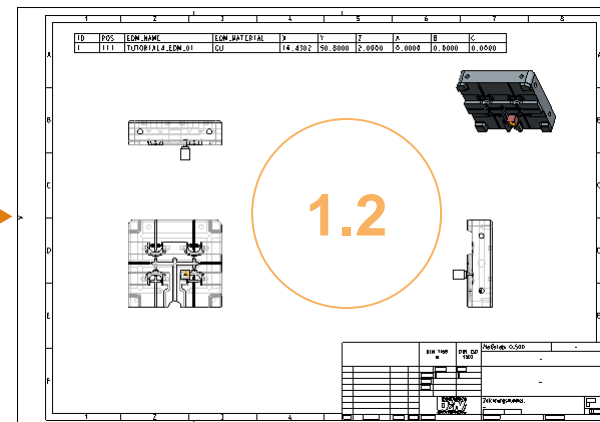
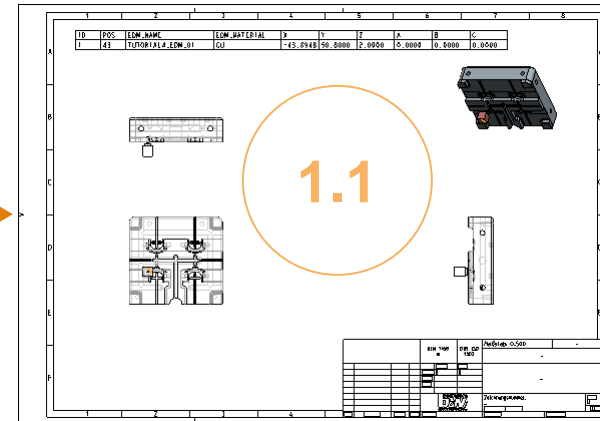
- **Group positions of model**
 - This is the default setting
 - All placements of one electrode model will be grouped on one drawing sheet
 - All placements will be collected in a simplified representation
- **Detailed output**
 - Every placement get's it's own drawing sheet
 - Every placement get's it's own simplified representation
- **The detailed output can be used with assembly drawing or part drawing. In both cases *asm_edm.drw* is used.**

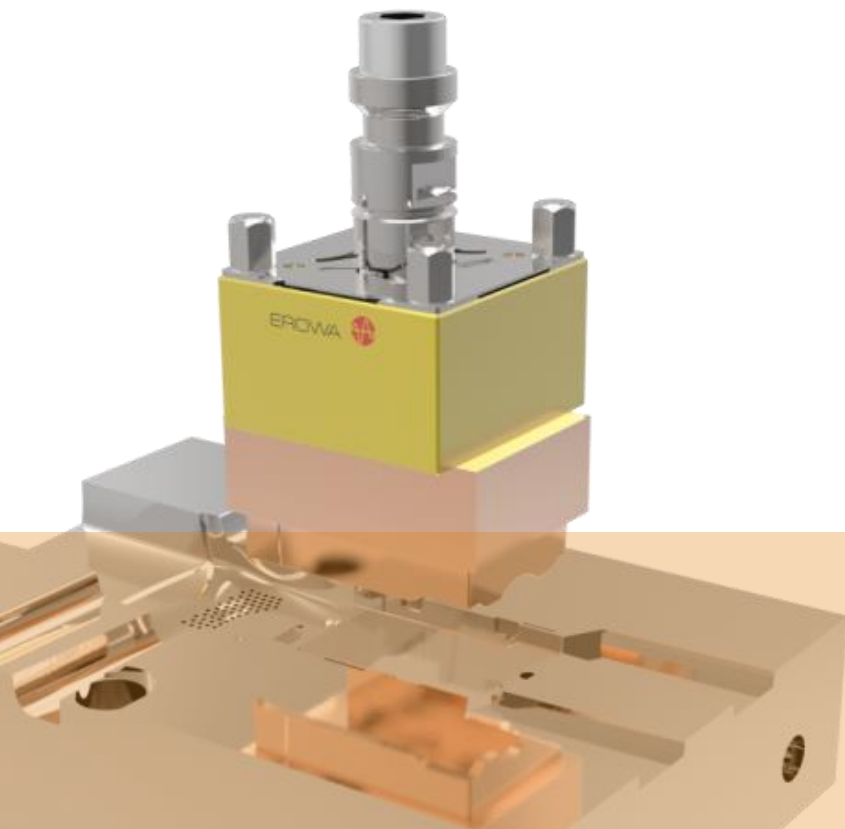
Drawing Options – Detailed Output

Gouped Output



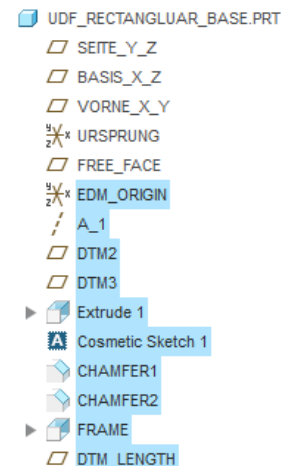
Detailed Output





UDF for Base Group

- Use **BASE_VORLAGE.PRT** to customize the base.
- You need to set option *relations_units_sensitive=no* before.
- Select **#UDF Library #New**
- Enter name for UDF
- **UDF Options**
 - Stand Alone
 - Include reference part? – No
- **Add Features beginning from EDM_ORIGIN**



- **Ref Prompts**

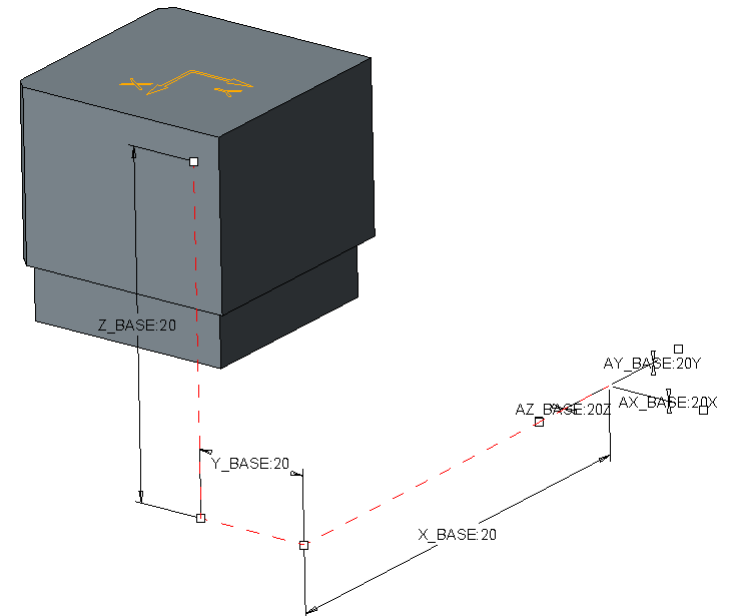
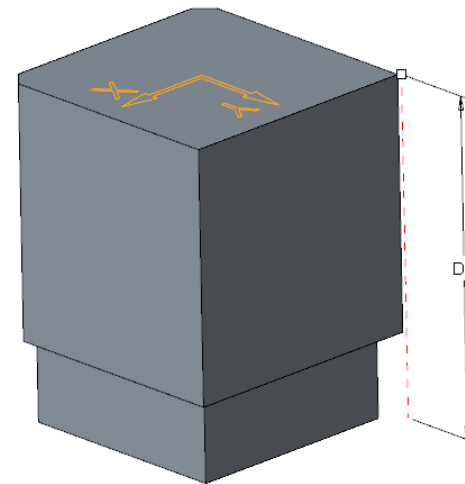
- coordinate system, logical coordinate system: REF_CSYS
- Single prompts
- surface, logical plane: FREE_FACE

- **Var Dims**

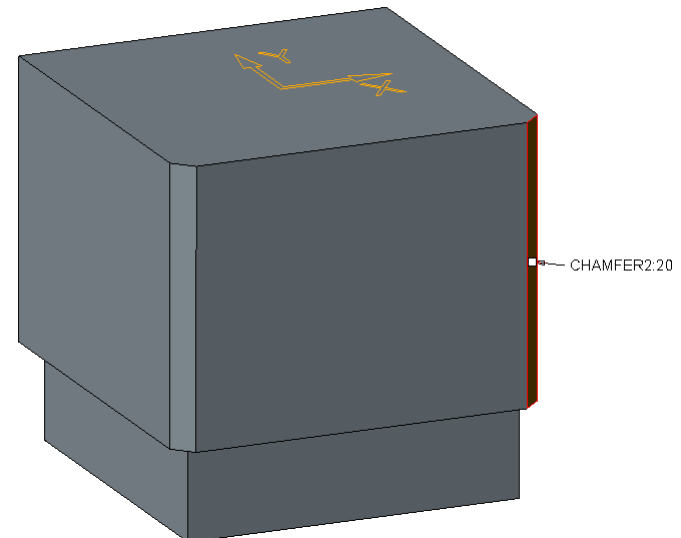
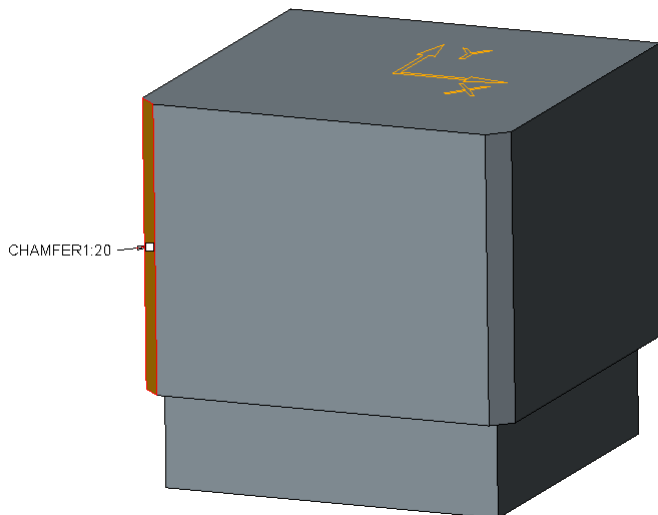
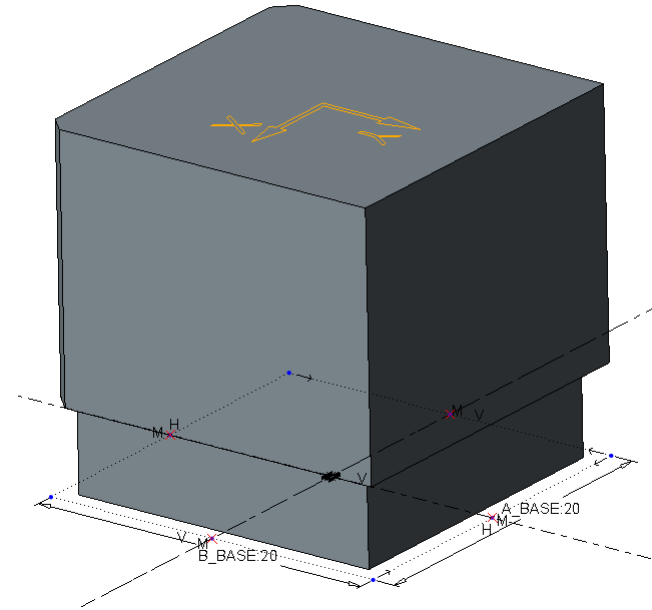
Name dimension symbols like dim prompts before and select:

- AX_BASE, AY_BASE, AZ_BASE
- X_BASE, Y_BASE, Z_BASE
- A_BASE, B_BASE
- CHAMFER1, CHAMFER2
- FRAME_HEIGHT, FRAME_WIDTH
- D2, LENGTH

- **Base height**
 - D2
- **Rotation of base**
 - AX_BASE
 - AY_BASE
 - AZ_BASE
- **Position of base**
 - X_BASE
 - Y_BASE
 - Z_BASE



- **Size of base**
 - A_BASE
 - B_BASE
- **Chamfers**
 - CHAMFER1
(feature and dimension)
 - CHAMFER2
(feature and dimension)



- **Frame**

Don't dimension size of FRAME directly! This will cause problems if base size is adjusted in GUI!

- FRAME_HEIGHT
- FRAME_WIDTH

- **Length**

Datum plane DTM_LENGTH should not intersect the electrode solid!

- LENGTH

