# ZW3D

# Mold Standard Parts Library Customization

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# ZW3D™ V2018 Mold Standard Parts Library Customization



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# Contents

This tutorial aims to show how to customize mold standard part. So users can build up their own part library following this tutorial.

With ZW3D library tools, users can easily insert or modify mold bases and standard parts.

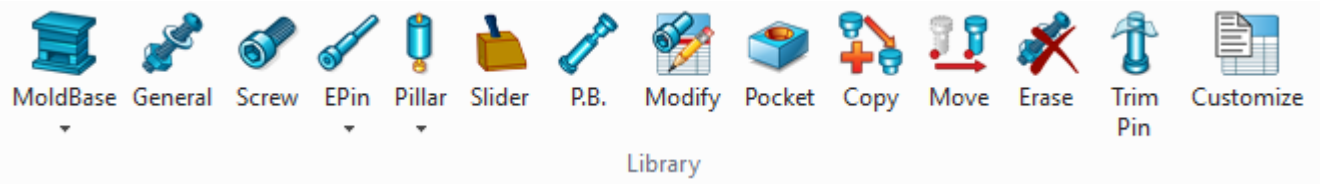



Figure1 Tools of Mold Standard Part Library

# 1 General Introduction

## 1.1 Insert MoldBase

Users can quickly insert a MoldBase from the MoldBase library. The library includes standard parts from various supplier, such as DME, FCPK, FUTABA, HASCO, etc.

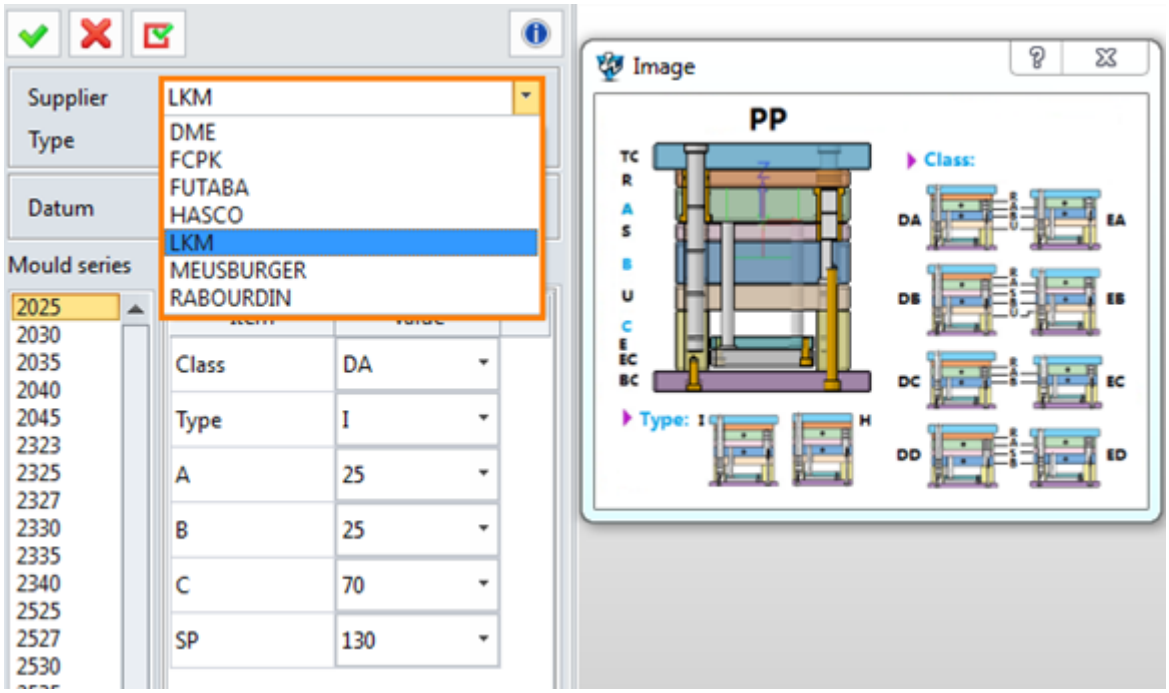



Figure2 Mold Base

## 1.2 Modify MoldBase

Users can modify an inserted MoldBase by “MoldBase Modify” command. For instance, users can easily change thickness of any plates.

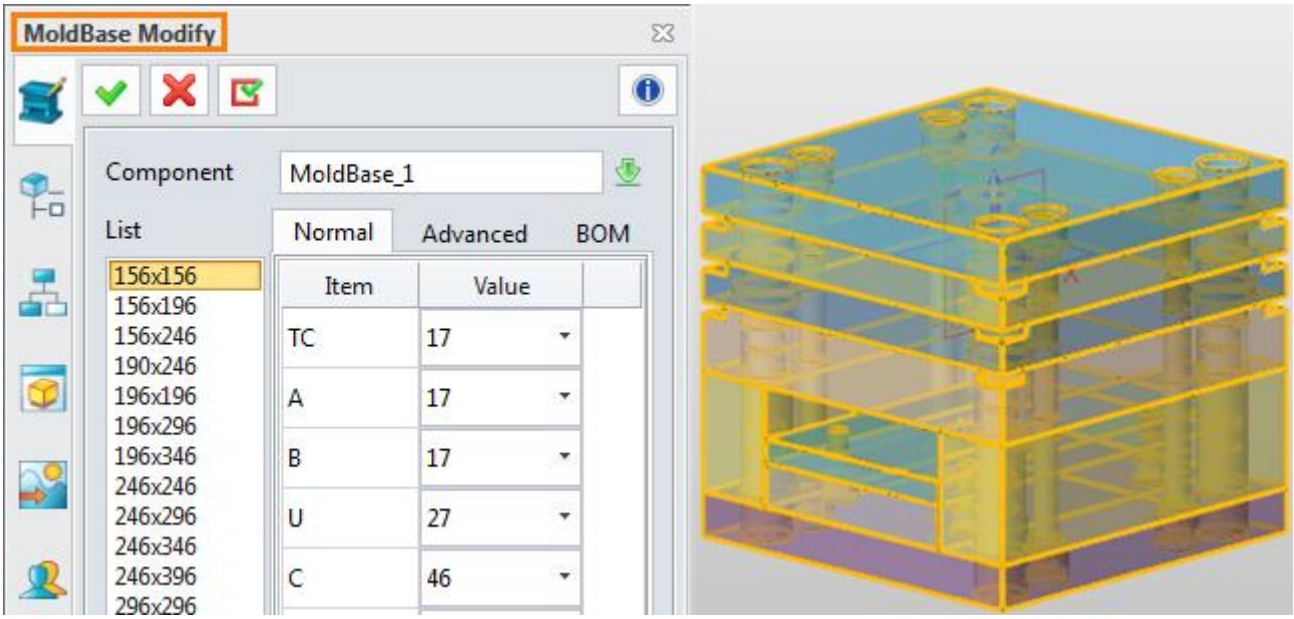



Figure3 Mold Base Modify

## 1.3 Insert General Standard Parts

Use “General” command to add general standard parts, including cooling, screw, spring, ejector pin, guide, etc. from different suppliers.

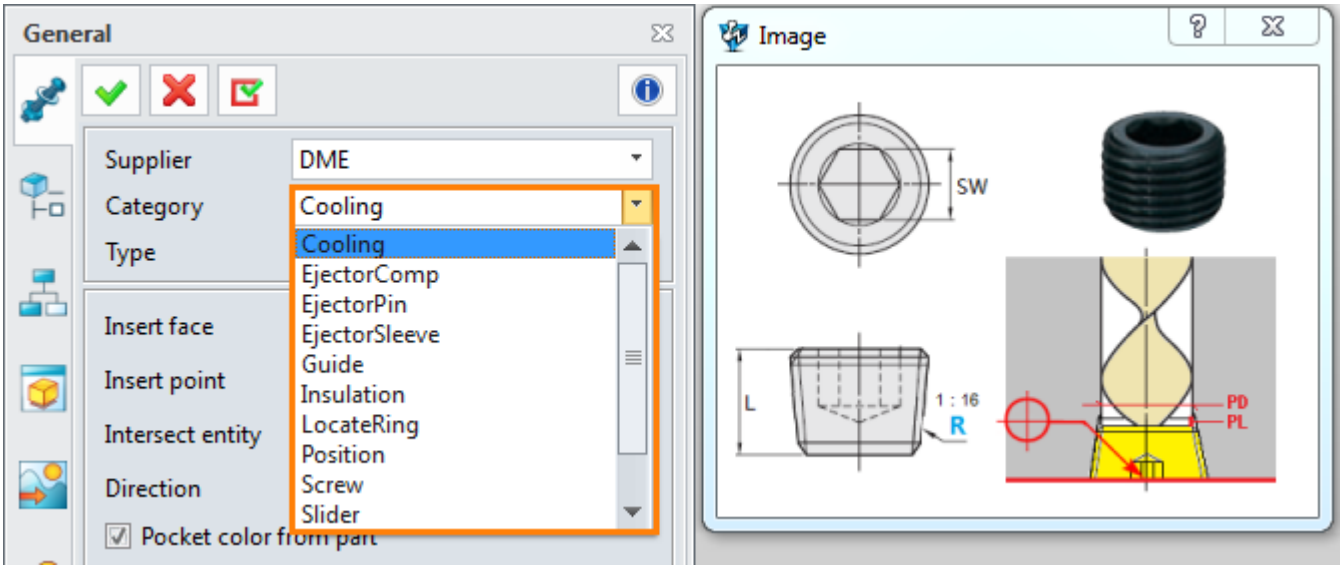



Figure4 General Standard Parts

## 1.4 Modify Standard Parts

By this command, users can modify inserted standard parts to another size of the same series.

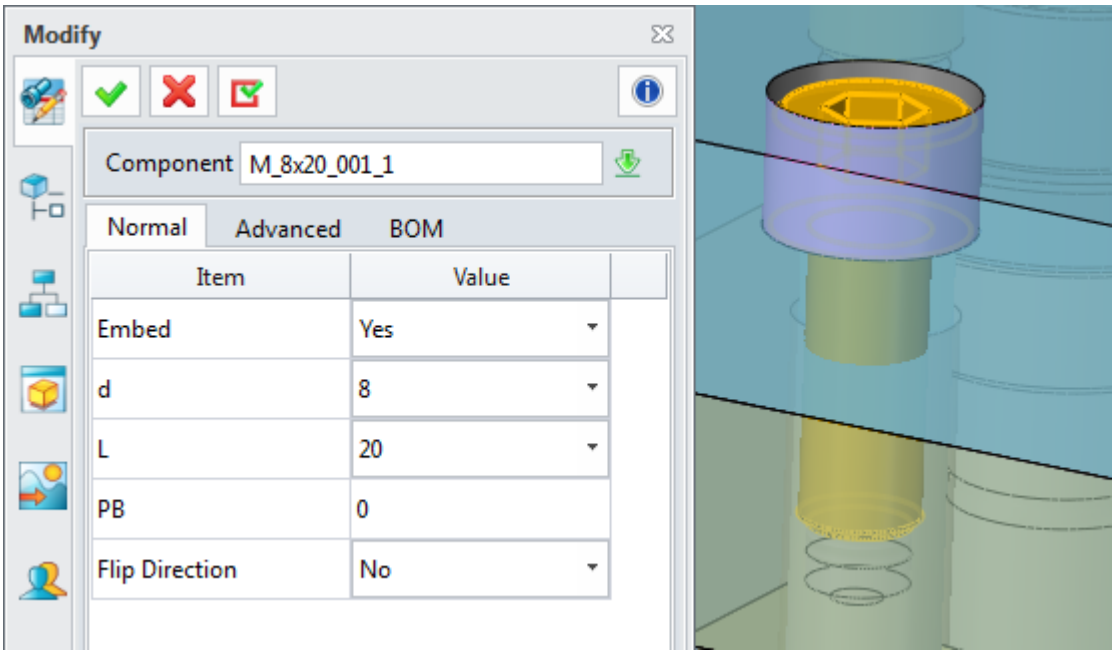



Figure5 Standard Part Modification

### 1.5 Customize Standard Parts

In the library tab, user can use “Customize” command customize MoldBases and standard parts.

How to customize them? See the details below.

# 2 Standard Part Customization

This chapter will introduce how to customize standard parts. There are five steps to follow.

### 2.1 Associated File Location

There are three key files for standard part definition, model (Z3 file), data (Par file) and legend (png file). All these files are located in “ZWMold” folder of ZW3D installation directory.

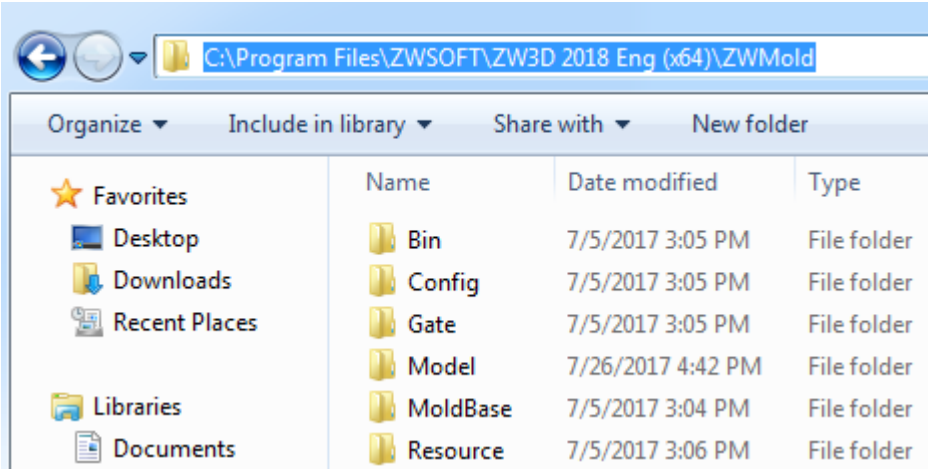



Figure6 ZW3D Installation Folder

All the models files (.Z3) are supposed to be in the "Model" folder. while the location of database files (.par files) and legend (.png file) are depended on different units, suppliers and types.

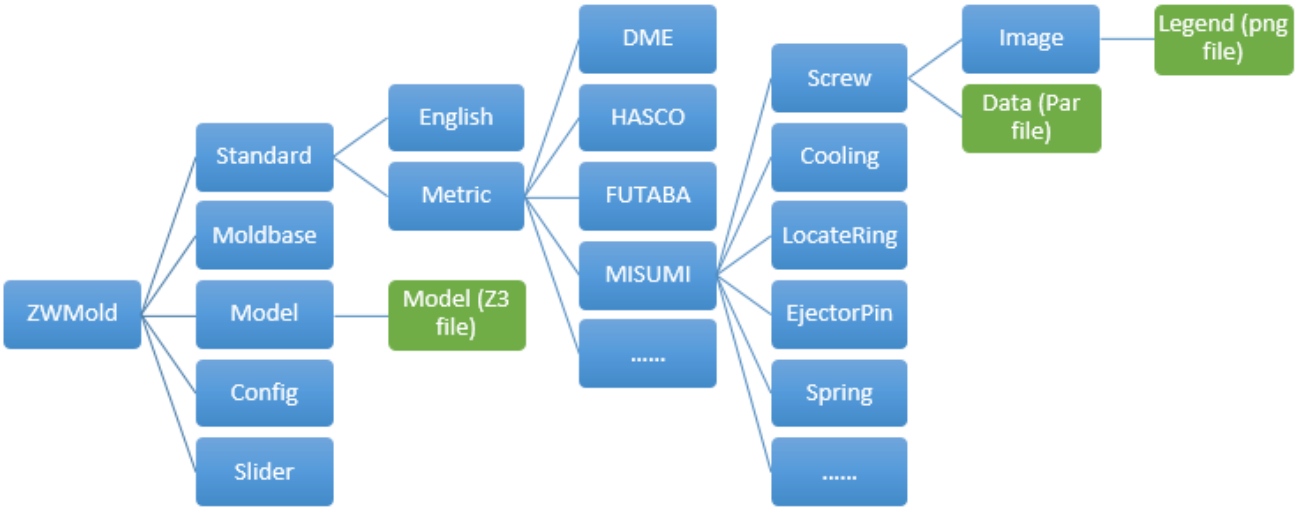



Figure7 Structure Tree of the Files Location

## 2.2 Custom Process of Standard Part

Let's use a screw case to introduce the steps to customize standard part.

### 2.2.1 Preparation

Analyze the standard part before modeling, extract key parameters, and set different status for location and orientation of the model. Create a "pocket" shape for the standard part.

When we get the catalog of the screw, we get all main parameters of the screw. Experience tells us that the parameter "M" and "L" are the most important driven factors for the screw, so we select them as the key parameters.

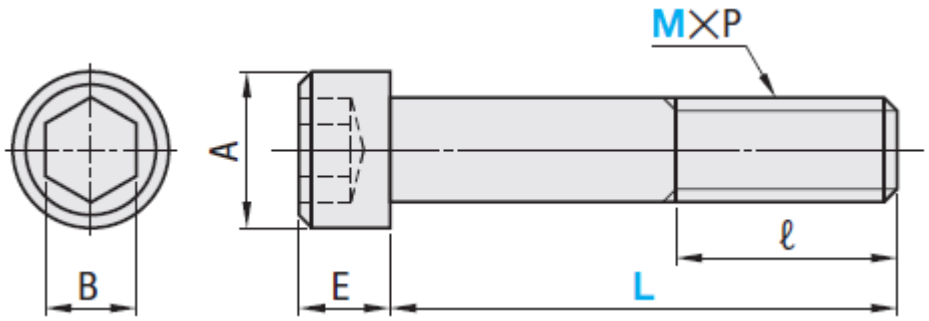



Figure8 Legend of the Screw

We can set different location points for the screw according to different assemble methods.

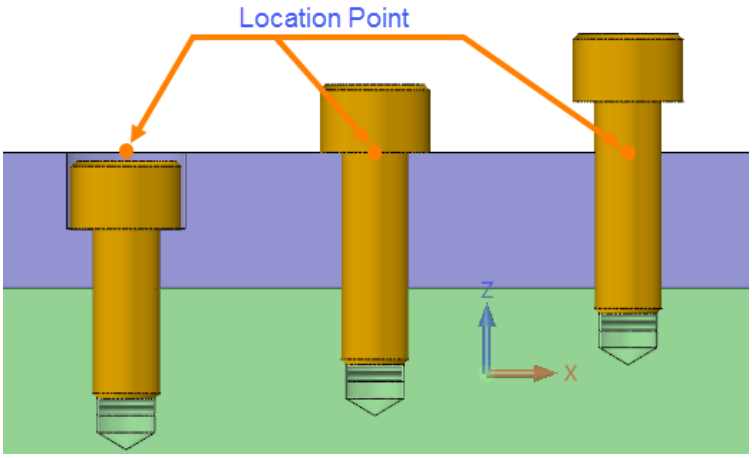



Figure9 Embedding Types of the Screw

### 2.2.2 Variables Creation

Create Variables to drive dimensions of the standard part so that we can change the geometric shape and size of the model by changing value of variables.

The equation manager will help us to create variables for the screw.

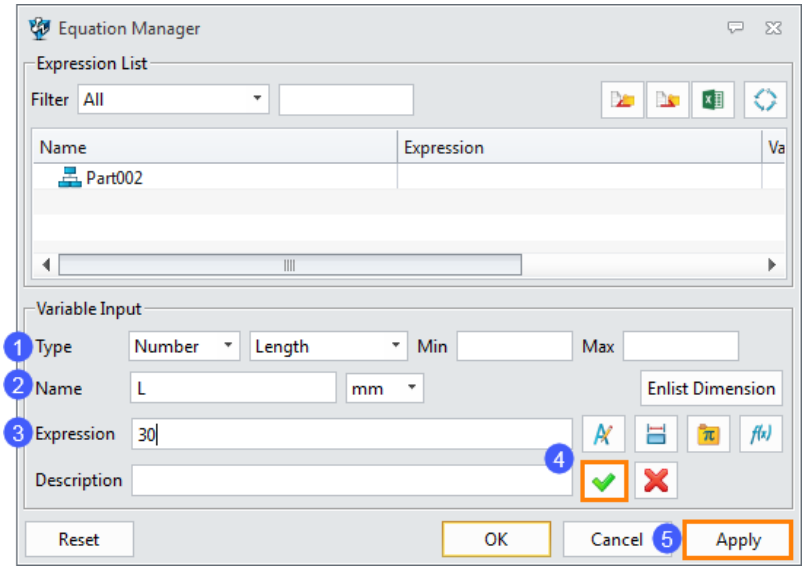
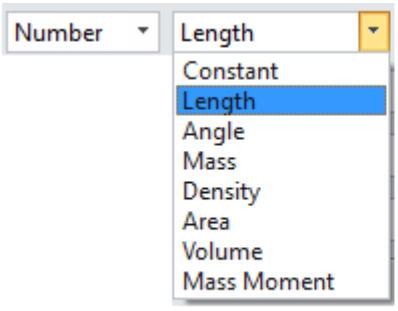



Figure10 Create Variables in Equation Manager

**Variable types** ： Variables are classified as four types (Number, String, Point, Vector)

**1. Number**：Number is a normal-used type. It provides many different kinds of sub-types. Each of them has different default unit.




| | |
|---|---|
| Constant | no unit |
| Length | mm |
| Angle | deg |
| Mass | kg |
| Density | kg/mm^3 |
| Area | mm^2 |
| Volume | mm^3 |
| Mass Moment | kg*m^2 |

Figure11 Variable Number Type

**2. String/Point/Vector Variable**

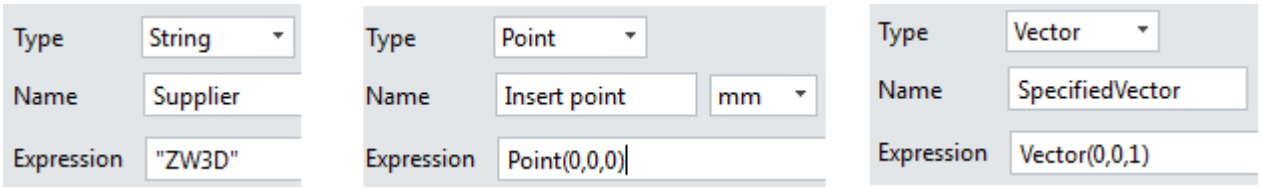



Figure12 String/Point/Vector Variable

All variables will be listed in the equation manager.

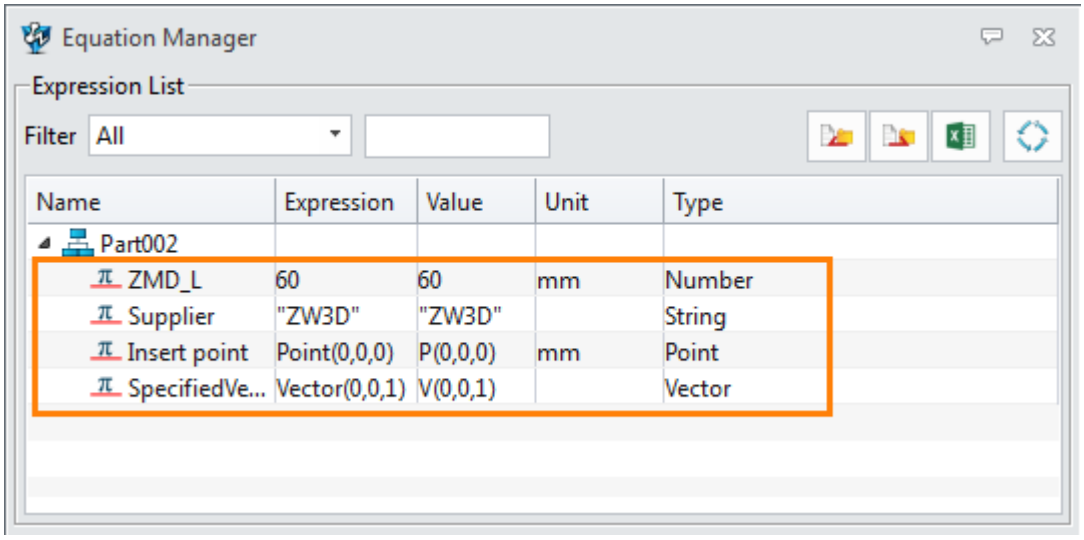



Figure13 Examples of Variable Types

**Rules of Equations**

**1. Common Operators**

"+"(Plus), "-"(Minus), "*"(Multiply), "/"(Divide), "^" (Power)

E.g. A = -3 + 30 B =A/2

**2. Common Functions**

cos(), sin(), tan() ,abs(), sqrt(), ln(), log()

E.g. C = 3*sin(30)

**3. Logical Operation**

"!"(logical negation), "&"(logical conjunction), "|"(logical disjunction)

E.g. D=(!(C&1)=0) then 0 else 1

**4. Conditional Operators**

"<"(less than), ">"(greater than), "="(equal to)

E = (D>0) then 15 else 5

**5. Conditional Statement**

(condition expression) then (expression1) else (expression2)

E.g. F = ((C=1) & (D=1)) then 50 else 100

**6. Others**

"( )"(bracket), used to change the calculation order.

Equation in bracket will be run first.

E.g. G=3, H=2,

Formula1: I= G+H*2, Result: I=7

Formula2: I= (G+H)*2, Result: I=10

## 2.2.3 Parametric Modeling

During parametric design, we need to ensure that sketches are well-defined and all dimensions are driven by the variables.

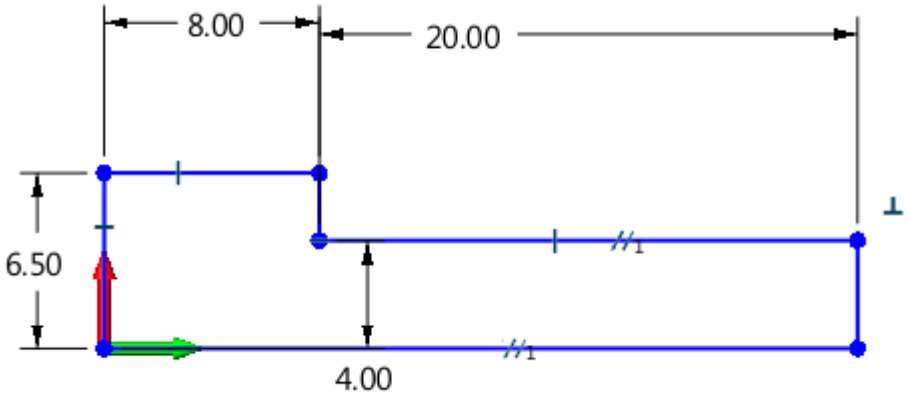



Figure14 Well-defined Sketch

Refer to the followin g image to call variables in Sketch Level.

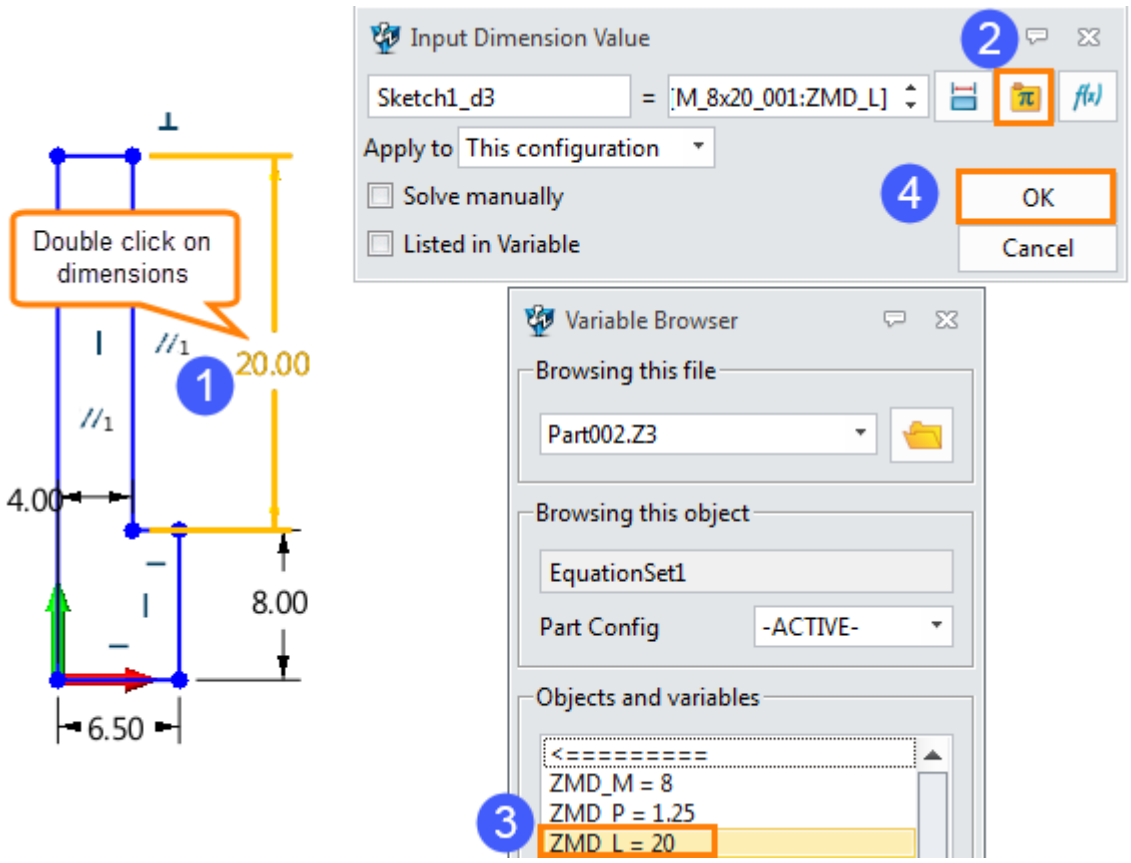



Figure15 Call Variables in Sketch Level

How to call variables in part level, as shown in the image below.

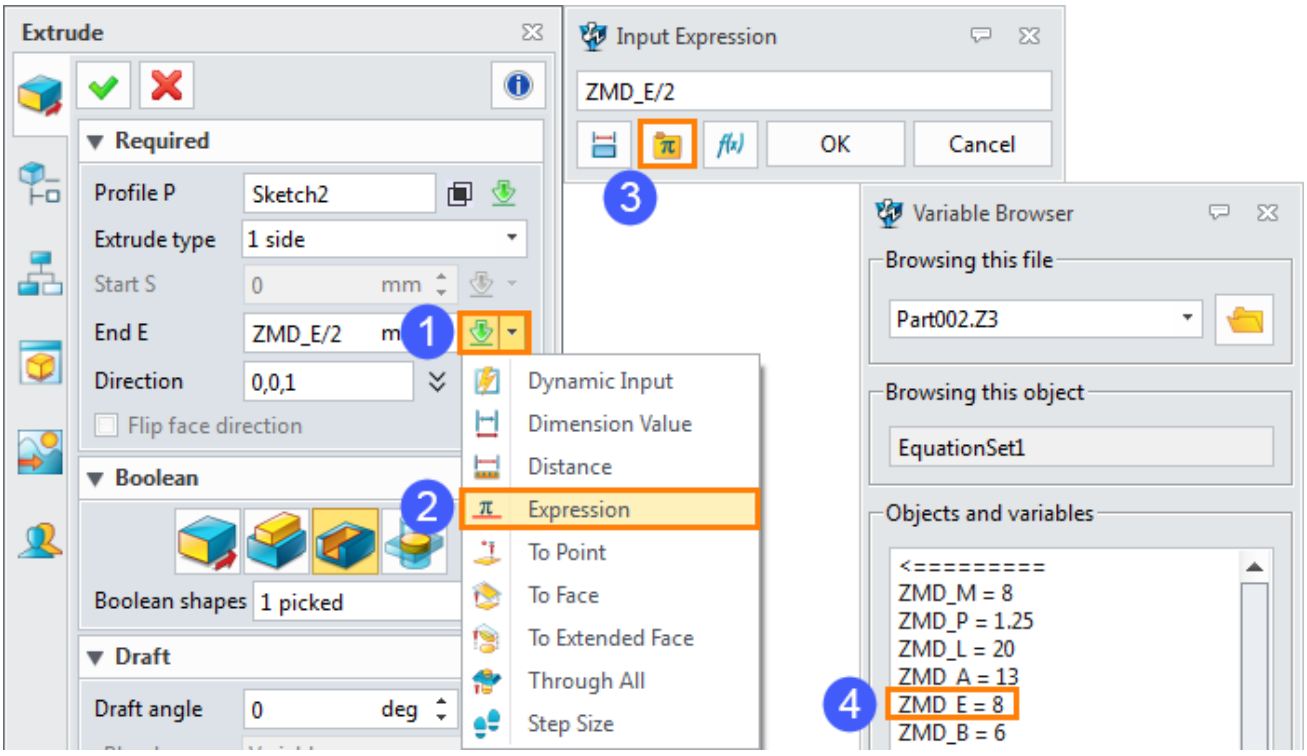



Figure16 Call Variables in Part Level

Generally, the final part includes two solid shapes. One is the standard part model. Another is named “pocket”, which is used for creating a pocket in intersected entities when inserting the standard part into an assembly.

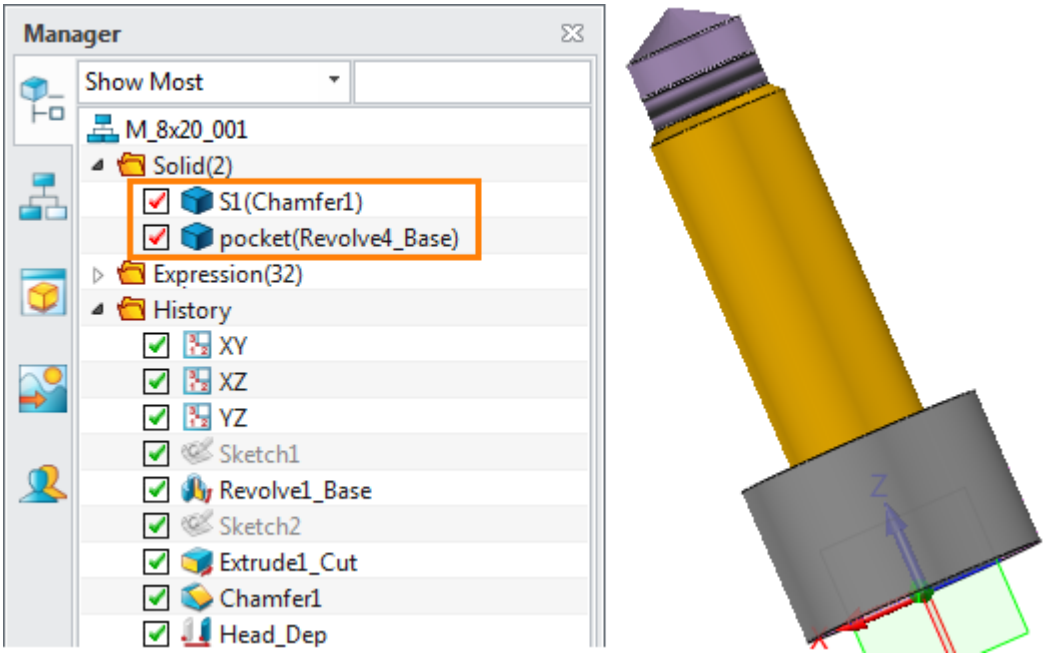



Figure17 Final Modeling Result

**Conditional Suppress**

Sometimes, models are a little bit different even among standard parts of the same series.

Take the position locking block as an example, if the length is changed, the number of the thread holes will be changed. So how to achieve these different status in the same model?

We can use “Conditional Suppress” to manage some features. Firstly,define an expression for the specified features. When the expression is true, the specified features will be suppressed. Otherwise, features are not suppressed.

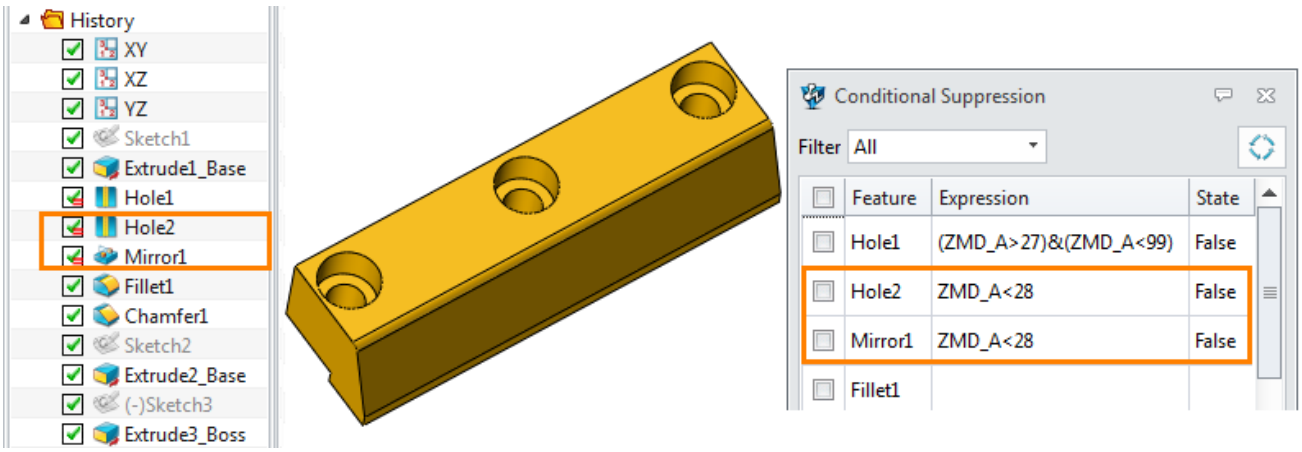



Figure18 Define Conditional Suppress

When the variable value (ZMd_A) is 26, the model result as shown in the image below.

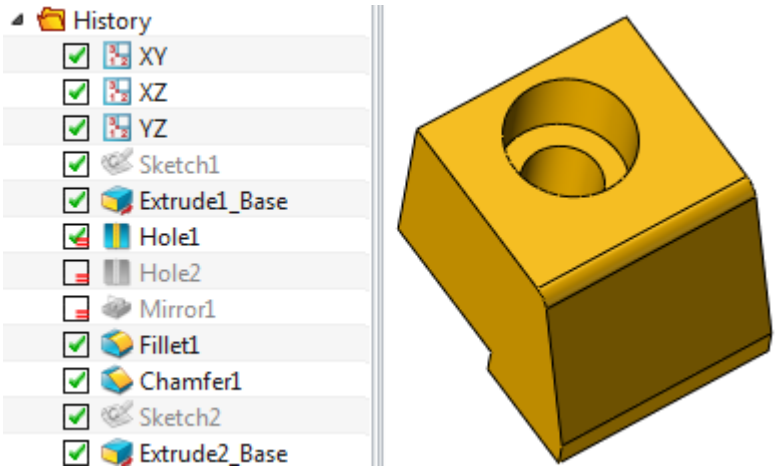



Figure19 Suppressed Status

**Skip To**

"Skip to" also is used to suppress features. Users can skip continuous features to suppress them. Take this screw model as an example, we could use "Skip to" command to suppress the continuous features from "Sketch2" to "Chamfer1" by a conditional expression such as A=1. Once the condition is achieved, the defined features will be suppressed, as shown in the right image.

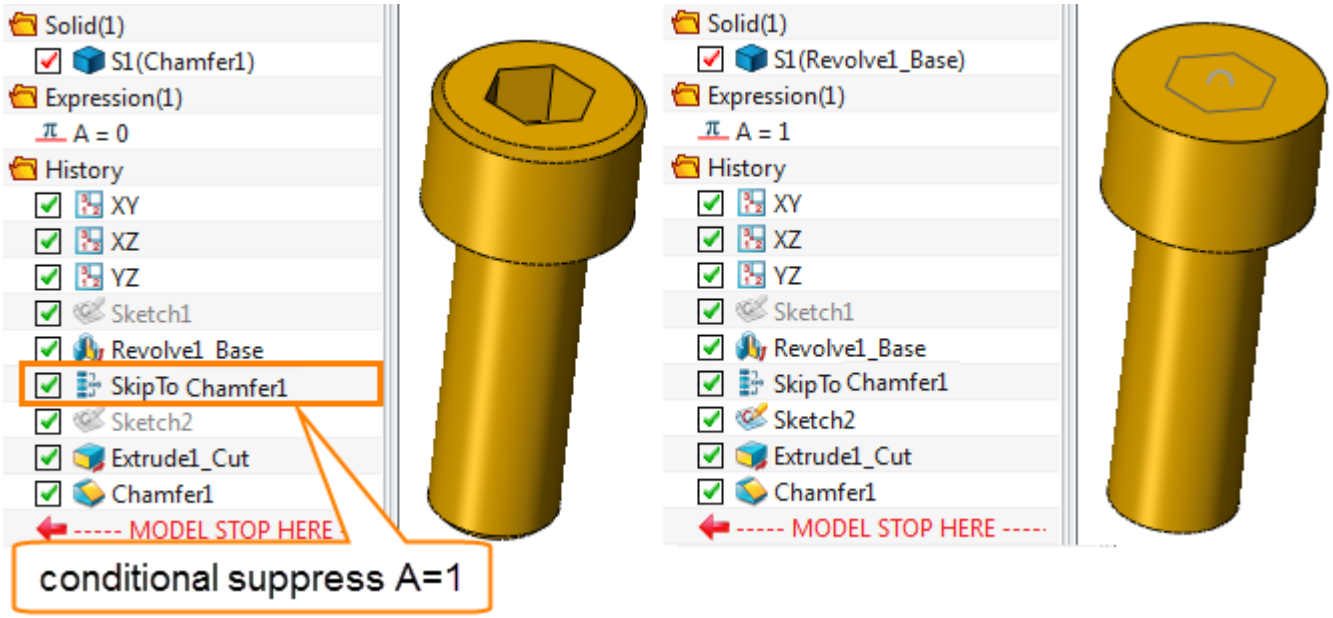



Figure20 Skip to Function

## 2.2.4 Input data

After finishing parametric design, users need to create a par file to record data for the standard part. The *.par file can be opened in notepad.

**Step1： Create Par File**

Launch ZW3D then create a new file. Click on “Customize” command in mold module. It will pop up a “Data Input” dialog. The folder path should keep the same as the files’ location folder (Please refer to chapter 2.1)

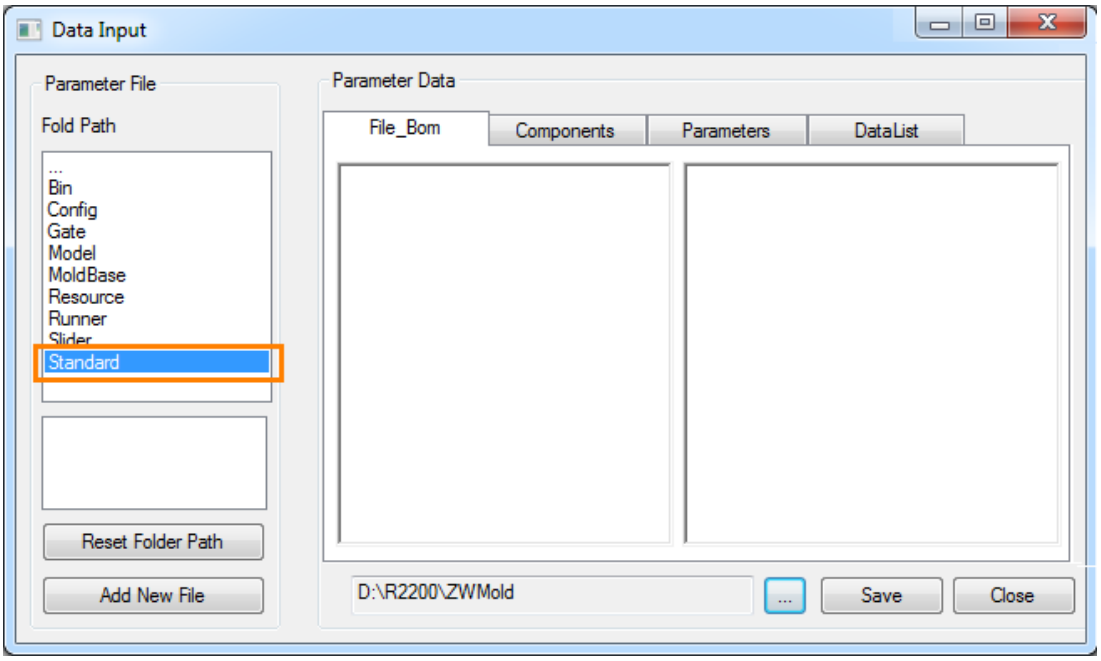



Figure21 Data Input Interface

Double click on “Standard” listed in Folder path, then choose unit, supplier and type step by step. The whole path will be shown at the bottom of the window.

Click “Add new file” button, then a dialog will pop up for creating a new file.

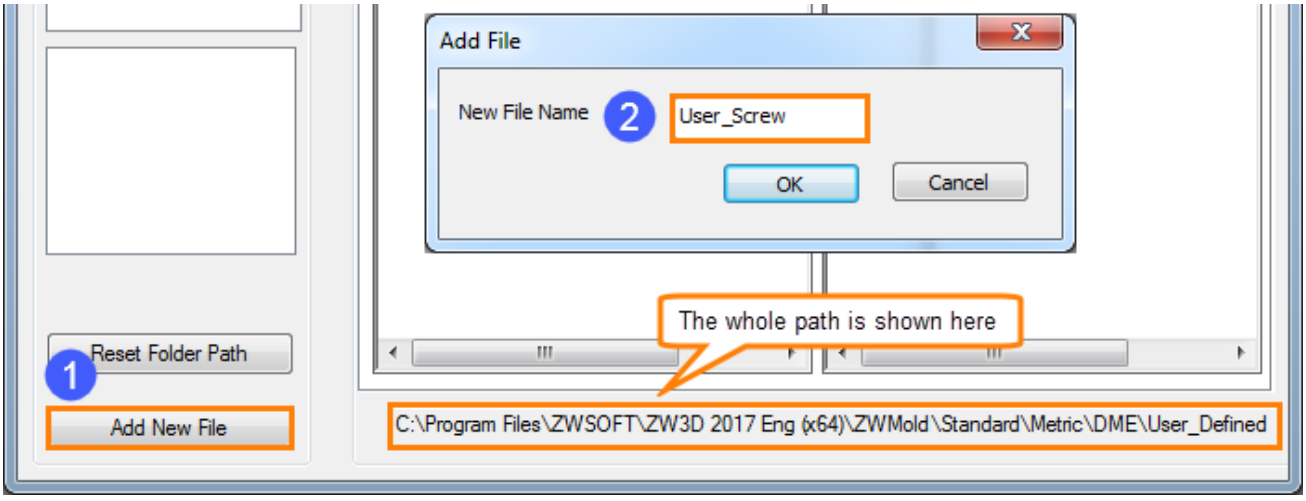



Figure22 Create a New Par File

Click OK. A *.par file will be created in the specified folder.

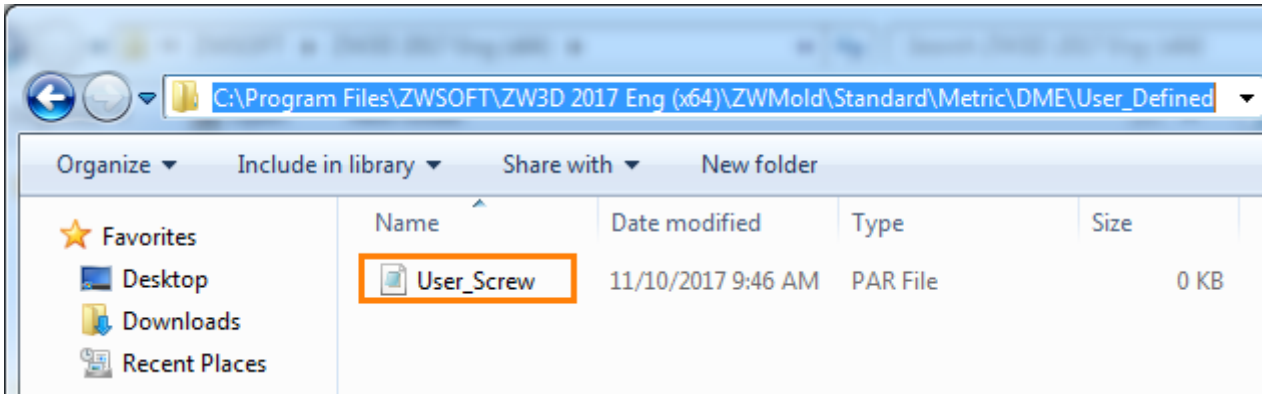



Figure23 New Par File

**Step2: Define Parameter Date**

Here are four tabs in the data input dialog.

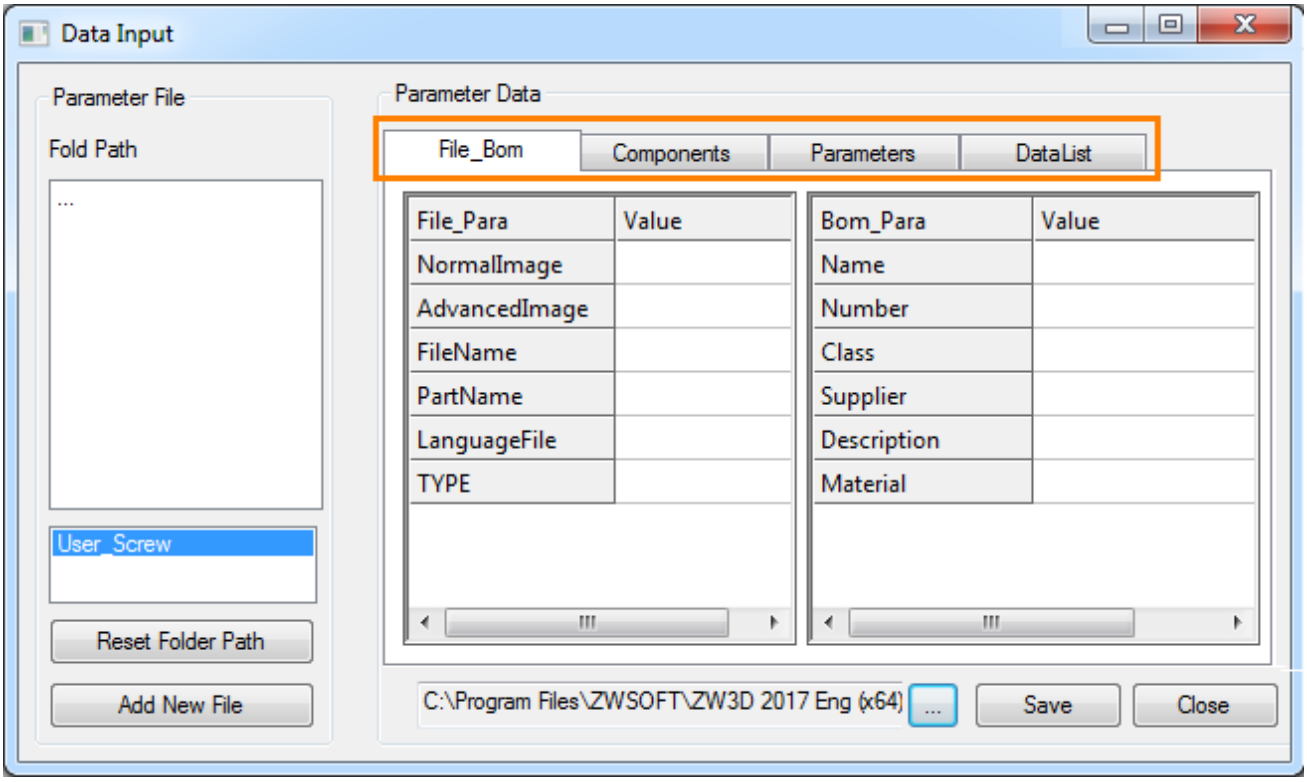



Figure24 Parameter Data Tab

**1) File_Bom**

**A. File Parameters**

This tab records part attribute likes file path, part name, standard type and so on.

Manually input file parameters in the specified format, as shown in the following image.

File_Bom | Components | Parameters | DataList

| File_Para | Value |
|---|---|
| NormalImage | Image\M.png |
| AdvancedImage | Image\M.png |
| FileName | ..\..\..\..\Model\ZWMScrew.Z3 |
| PartName | CB |
| LanguageFile | |
| TYPE | STD_Screw |

| Bom_Para | Value |
|---|---|
| Name | M_<ZMD_M>x<ZMD_L> |
| Number | M<ZMD_M>x<ZMD_L> |
| Class | |
| Supplier | DME |
| Description | |
| Material | DIN 912-12.9 |

Figure25 File & Bom Parameters

**Normal Image:**

This image will be shown in the normal tab when inserting the part.

It supports short path and its whole path, please refer to the figure 6.

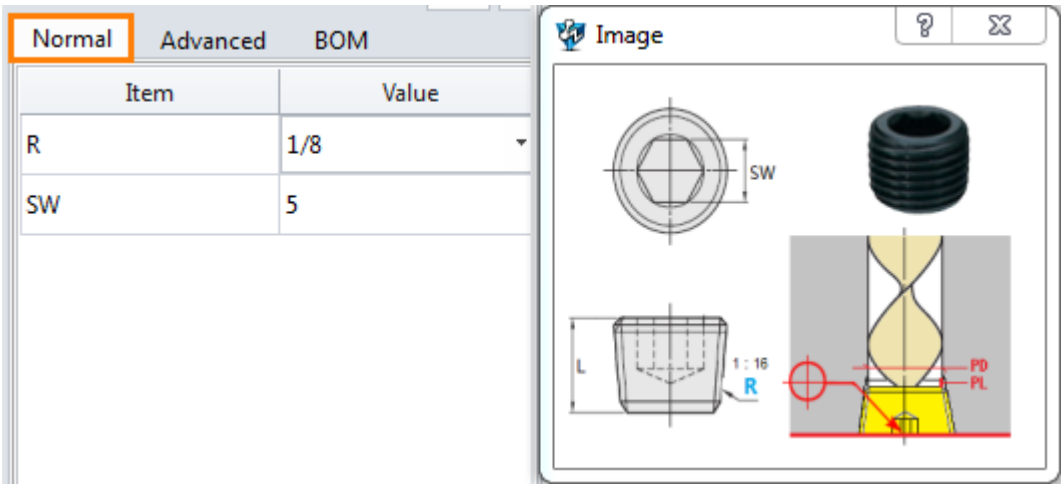



Figure26 Normal Image

**Advanced Image:** It could be the same as the normal image.

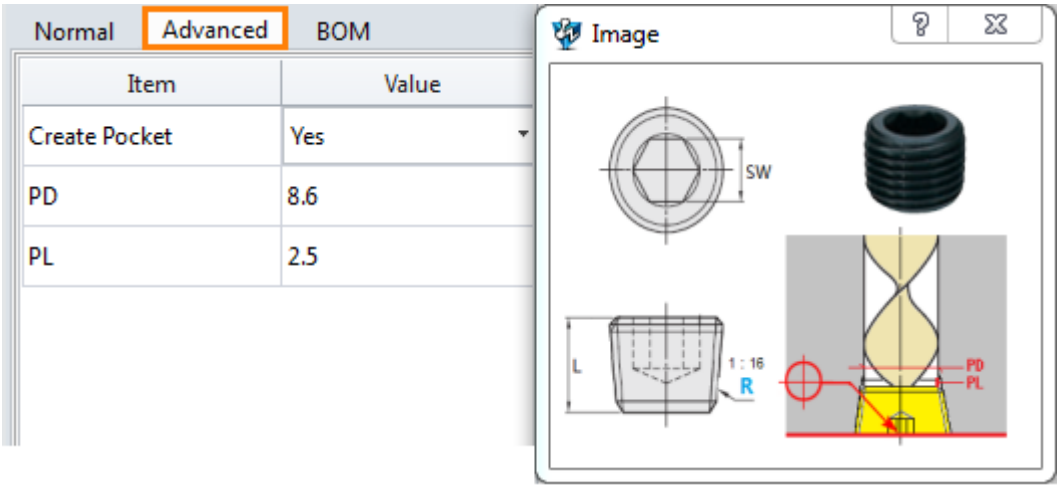



Figure27 Advanced Image

**File name：** z3 file name

Z3 file should be stored in“Model” folder. (Please refer to chapter 2.1.) It supports short path.

**Part name:** standard part name

In ZW3D, the part name could be different with the file name.

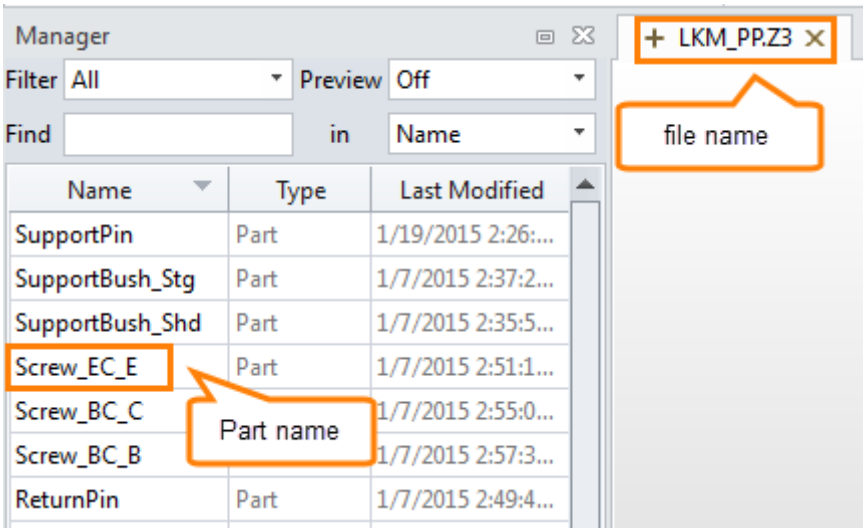



Figure28 File Name and Part Name

**Language File :**

Support the short path, use the way “%ID” to specify string of the “ID” from the language file. You can set them with “config” command.

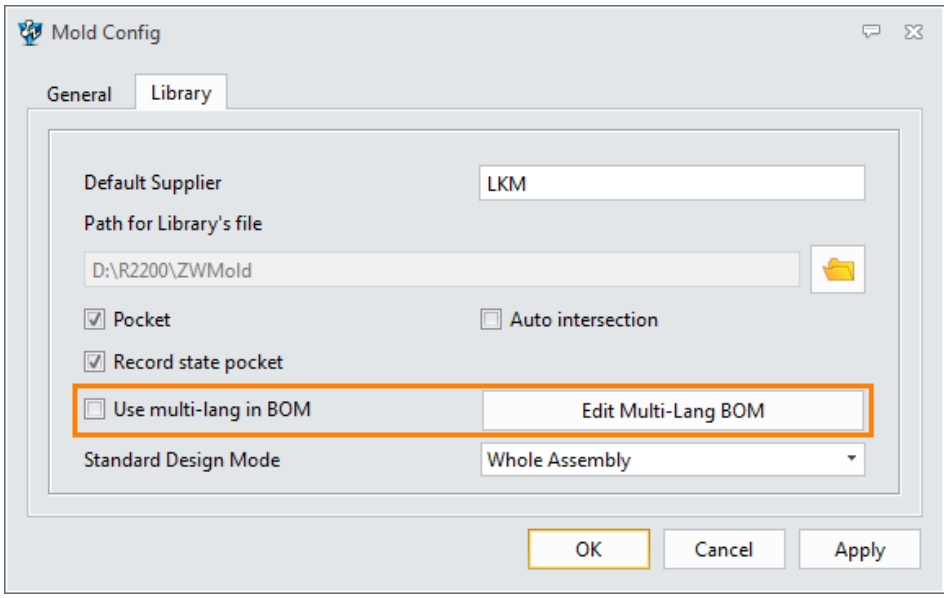



Figure29 Multi-language in BOM

**Type:** standard part type in ZW3D

Such as: there are 16 types of Misumi standard part.

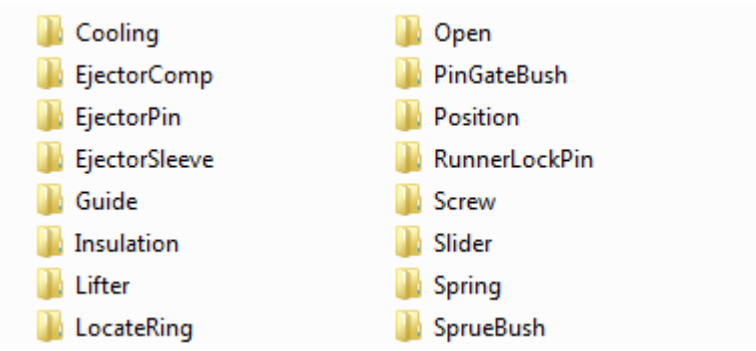



Figure30 Standard Part Types

To distinguish customized standard part from others, you could add the prefix "STD_" for type name. Such as: STD_Ejector/ STD_Guide/STD_Screw/ STD_EjectorPin/ STD_Cooling / STD_Sprue/ STD_Open/STD_Slide/STD_Lift

It easier to hide or show components based on this kind of type name. You can use the visibility command to decide which type should be hidden or shown.

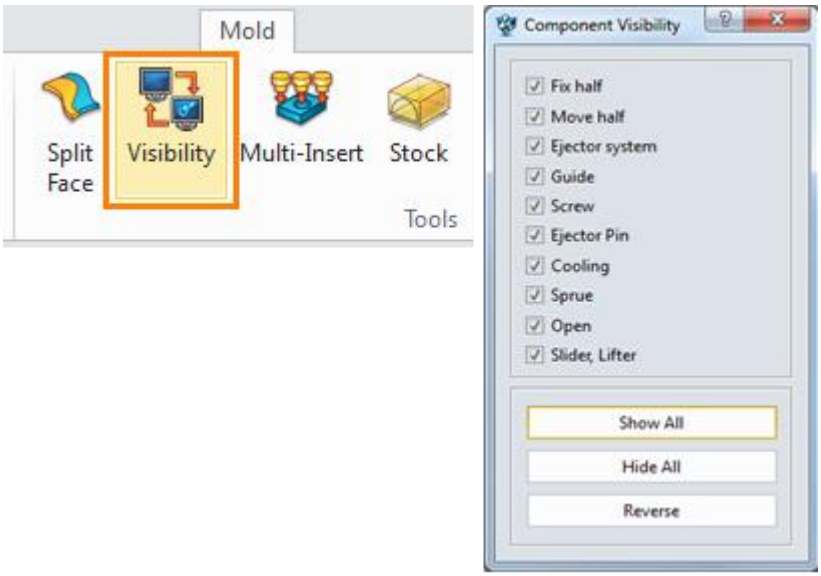



Figure31 Component Visibility

**B. BOM Parameters**

**Name：** the name of instance

The name consisted of the model number and part size is better. Take the screw for example, name it as M_<ZMD_M>x<ZMD_L>. ZMD_M and ZMD_L are the variables of the screw, when ZMD_M=4, ZMD_L=10, the name is M_4x10.

***Note:*** *The name doesn't support the "space" between the words.*

**Number:** Number of order.

**Class:** It is Stand-by.

**Supplier:** Supplier of the standard part

**Description:** Description of the standard part

**Material:** Material of the standard part.

### 2) Component

ZWMold library includes standard parts and standard assemblies. The standard components include assembly and part file, assembly data and part data.

Let's take the MoldBase as an example.

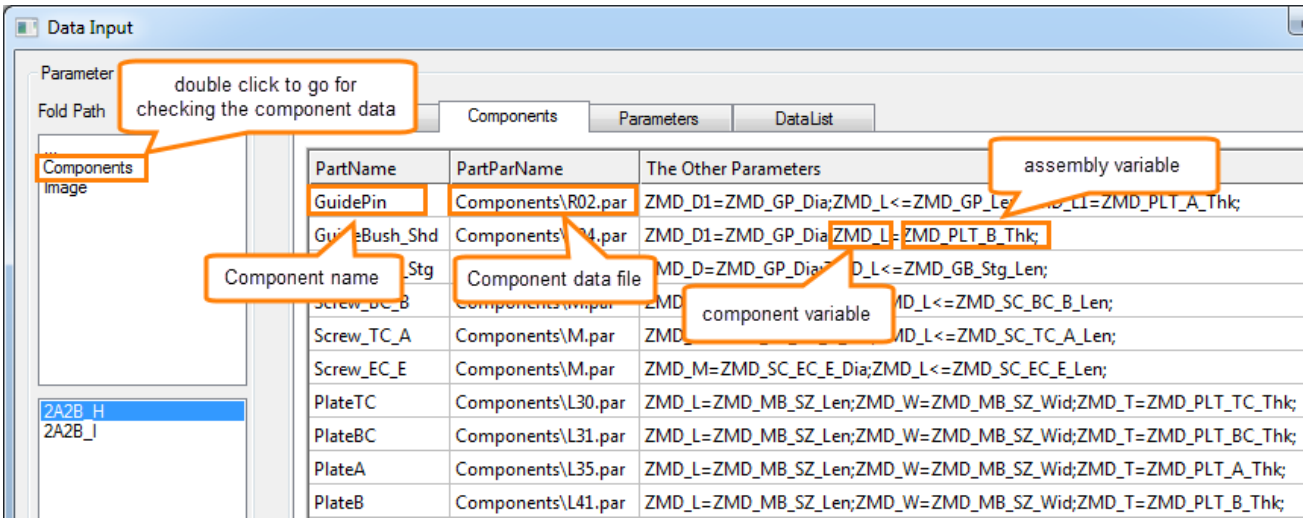



Figure32 Components Tab

***Note:***

*In the field of "The other parameter", there is at least but only one editable parameter on the left side of the equation. For example, "ZMD_L+ZMD_E>=ZMD_SC_EC_E_Len", if "ZMD_L" is an editable variable, "ZMD_E" can only be the "only-read" variable.*

*In this tutorial, the standard component is not the key point, so it is simply introduced here.*

### 3) Parameters

In Z3 file, a lot of parameters created to drive the model. In this parameter tab, we need to create the same variables as those in Z3 file.

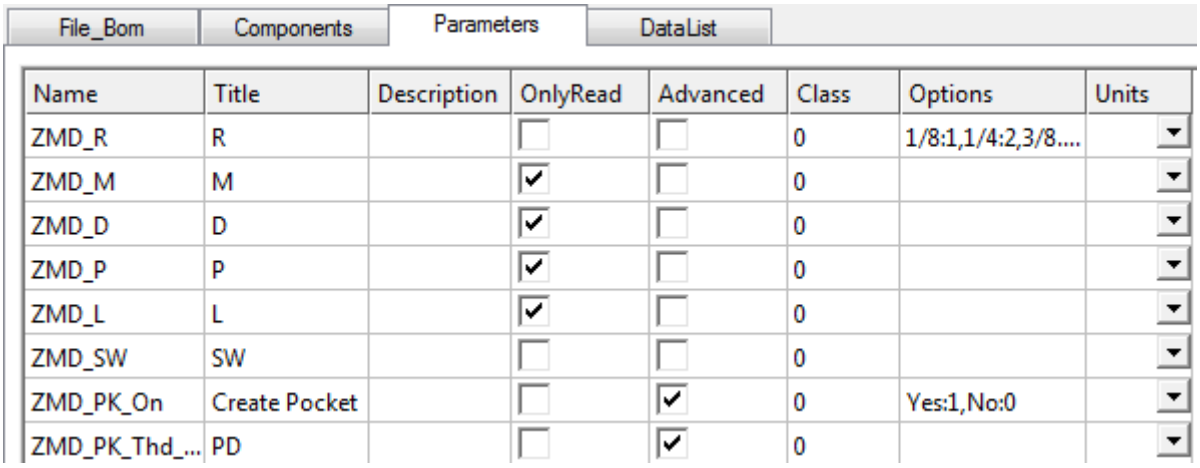



Figure33 Parameters Tab

**Name:** the variable name

**Title:** displayed item name when inserting the part. If it is empty, it will keep the same as the variable name.

**Description:** Description of parameters

**Only Read:** If it is checked, the related parameters will be only read.

**Advanced:** If it is checked, the related parameters will exist in "Advanced" tab.

**Class:** It is Stand-by.

**Options:** You can define a simple "select statement",

For example, "Yes:1, No:0" which means, when inserting the part, if the users use "Yes", the variable equals to 1; on the other hand, if users use "No", the variable equals to 0.

**Unit:** variable unit

If it is empty, the unit is following the default unit, which is decided in system configuration.

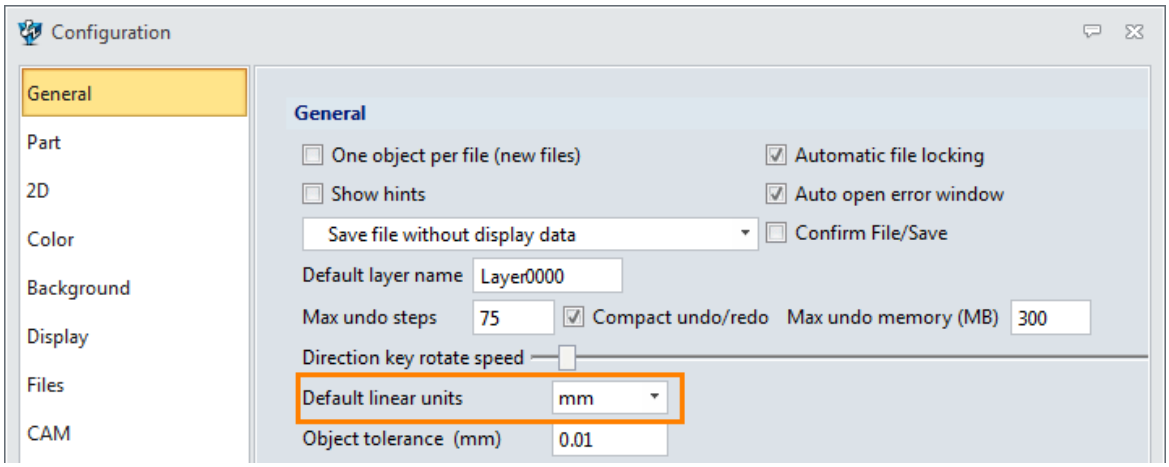
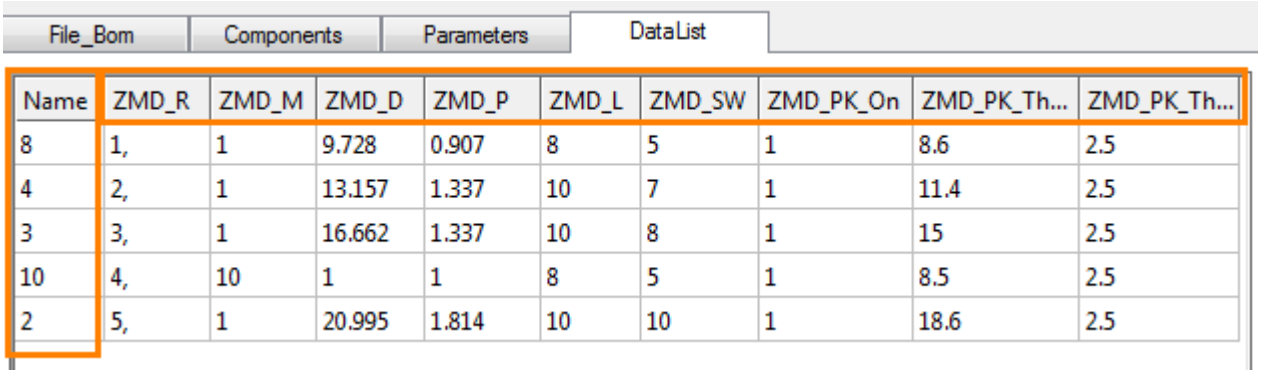



Figure34 Default Units in Configuration

### 4) Data list

The tab shows all detail size values of part shape and pocket shape, as shown in figure 36.

The titles of the data list are inherited from the “parameters” tab, as shown in figure 34.

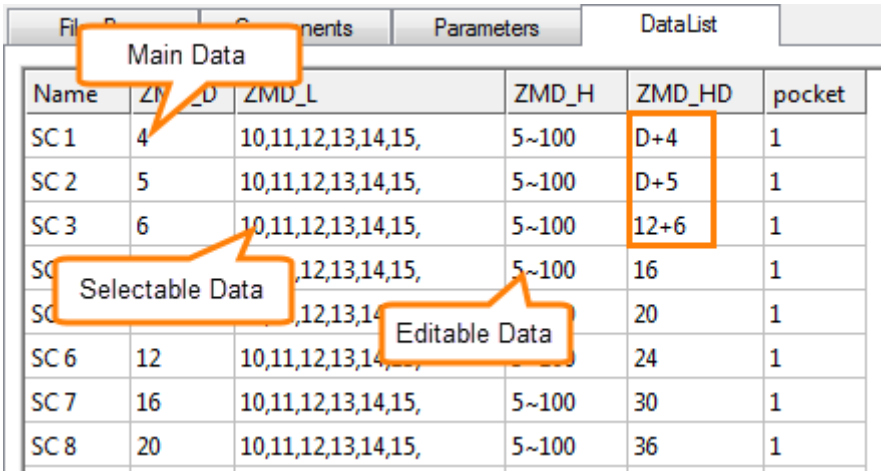



| Name | ZMD_R | ZMD_M | ZMD_D | ZMD_P | ZMD_L | ZMD_SW | ZMD_PK_On | ZMD_PK_Th... | ZMD_PK_Th... |
|---|---|---|---|---|---|---|---|---|---|
| 8 | 1, | 1 | 9.728 | 0.907 | 8 | 5 | 1 | 8.6 | 2.5 |
| 4 | 2, | 1 | 13.157 | 1.337 | 10 | 7 | 1 | 11.4 | 2.5 |
| 3 | 3, | 1 | 16.662 | 1.337 | 10 | 8 | 1 | 15 | 2.5 |
| 10 | 4, | 10 | 1 | 1 | 8 | 5 | 1 | 8.5 | 2.5 |
| 2 | 5, | 1 | 20.995 | 1.814 | 10 | 10 | 1 | 18.6 | 2.5 |

Figure35 Data List

### Rules to data input

- According to different formats, the variables can be classified into five types: main parameter, selectable parameter, editable parameter, “only read” parameter and advanced parameter.




| Name | ZMD_L | ZMD_H | ZMD_HD | pocket |
|---|---|---|---|---|
| SC 1 | 10,11,12,13,14,15, | 5~100 | D+4 | 1 |
| SC 2 | 10,11,12,13,14,15, | 5~100 | D+5 | 1 |
| SC 3 | 10,11,12,13,14,15, | 5~100 | 12+6 | 1 |
| SC | ,12,13,14,15, | 5~100 | 16 | 1 |
| SC | ,12,13,14 | | 20 | 1 |
| SC 6 | 10,11,12,13,14 | | 24 | 1 |
| SC 7 | 10,11,12,13,14,15, | 5~100 | 30 | 1 |
| SC 8 | 10,11,12,13,14,15, | 5~100 | 36 | 1 |

Figure36 Main/Selectable/Editable Paramater

### Main parameter:

Select the different main parameter value to get the different standard part. So normally, there is only one parameter as main parameter.

### Selectable parameter:

Use comma to separate the values. All available values are listed in the drop-down box.

### Editable parameter:

Users can directly edit the value when inserting the standard part. In the data table, you can

use “~” to define a range of the input data. For example, if you define the ZMD_N ( “40~140”), the input value should be between 40 and 140. Otherwise it will hint that the value is invalid.

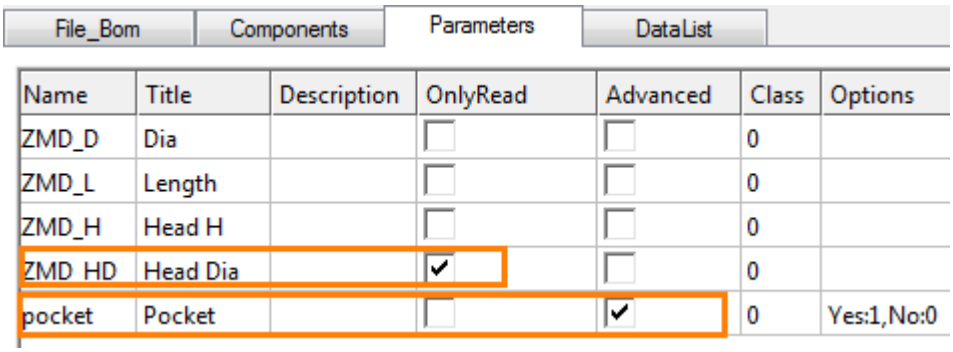



Figure37 “Only Read” and “Advanced”

**“Only read” parameter:**

The “only read” parameter allows us to use equation to replace the single value.

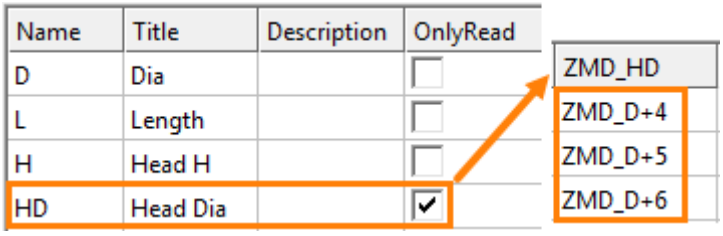



Figure38 “Only read” Parameter

**Advanced Parameter:**

The default value of the advanced parameters could be the same.

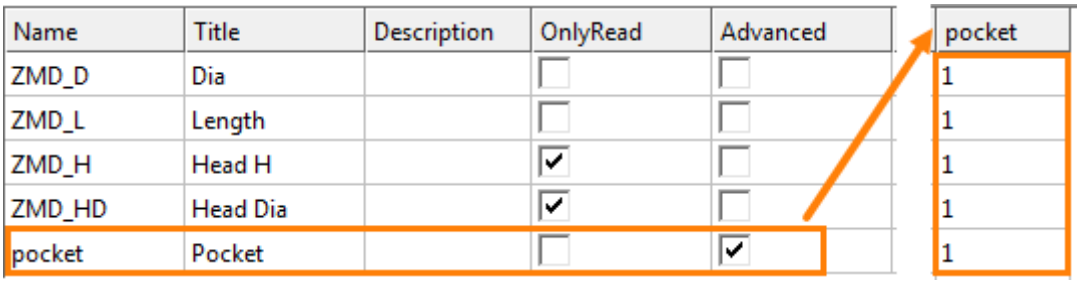



Figure39 Advanced Parameter

## 2.2.5 Verify

Finally, we should check if all inputted data are correct.

The normal way to verify data is to insert the standard part in different sizes for checking.

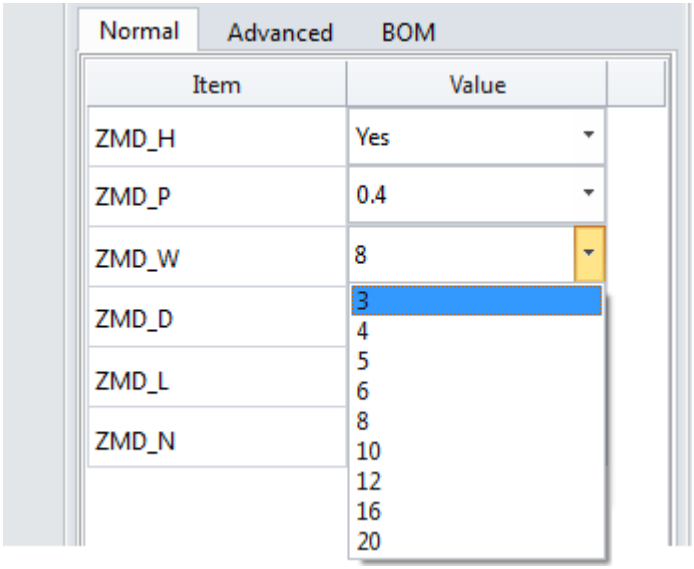



Figure40 Verify Data

Check if other options like “pocket” and “embed” work or not.

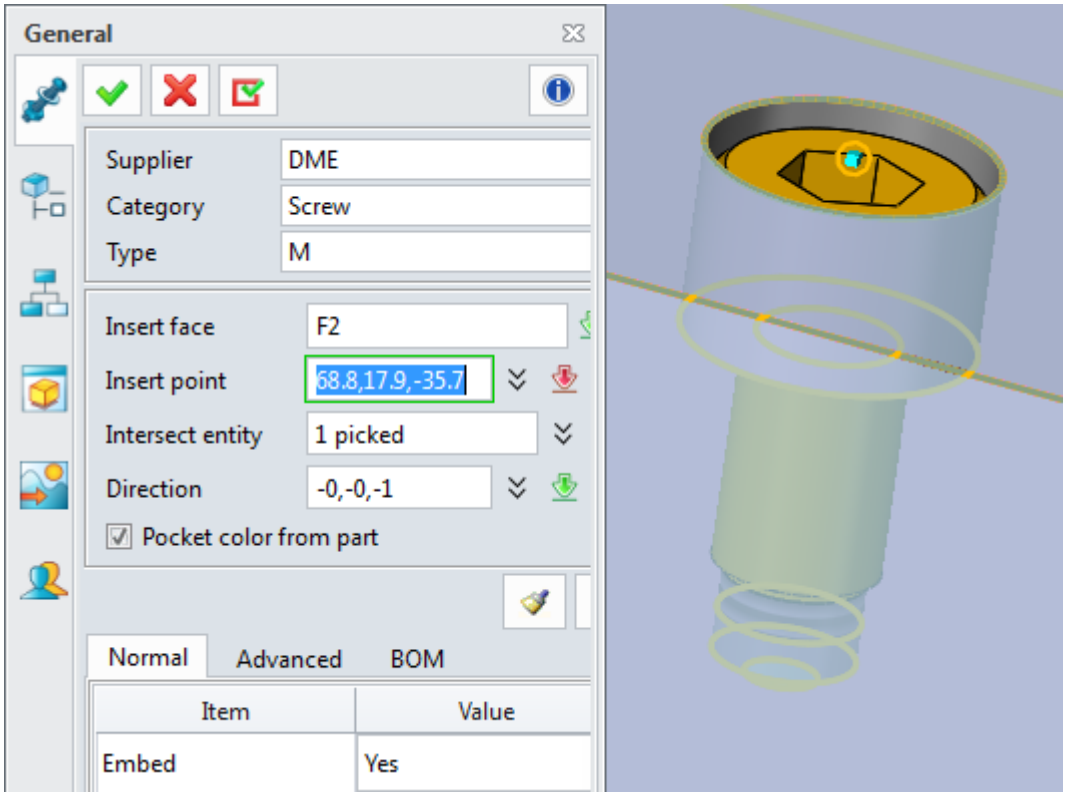



Figure41 Check Special Options

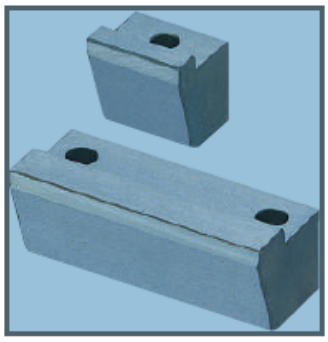
# 3 Case

Next, we will learn how to customize a standard part from the position locking block “LBCS” of MISUMI.

Here are legends for the position locking block.

| Part Number | | M | H |
|---|---|---|---|
| Inlay part 4mm | Inlay part 8 - 10mm | | |
| LBCS | LBCSH | SKS3 | 53~56HRC |
| LBCM | LBCMH | HPM2T equivalent | 37~41HRC |
| LBCD | — | SKD61 | 50~55HRC |

RoHS



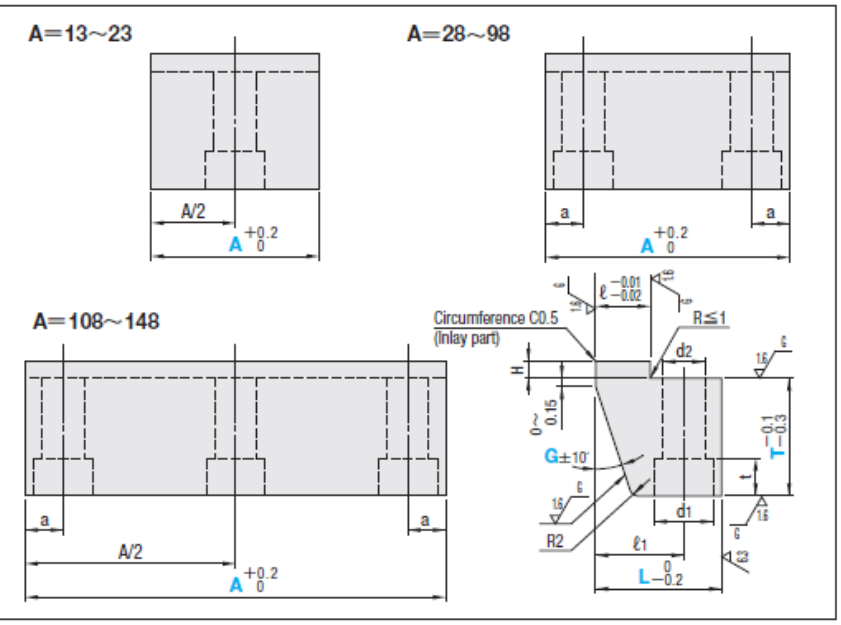



Figure42 Legend for the Position Locking Block

And its standard parameters

■Inlay part H=4mm

| H | a | ℓ | ℓ1 | d1 | d2 | t | Part Number Type | L | T | A | G° 1° increments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 6 | 6 | 13 | 9.5 | 5.5 | 6 | LBCS | 20 | 10 | 13 15 18 23 28 33 38 48 | 5~33 |
| | | | | | | | | | 15 | 13 15 18 23 28 33 38 48 58 | 5~24 |
| | | | | | | | | | 20 | | 5~18 |
| | 7 | 10 | 17 | 11 | 6.5 | 7 | | 25 | 10 | 18 23 28 33 38 48 58 68 78 88 98 | 5~33 |
| | | | | | | | | | 15 | 18 23 28 33 38 48 58 68 78 88 98 108 | 5~33 |
| | | | | | | | | | 20 | 23 28 33 38 48 58 68 78 88 98 108 | 5~26 |
| | | | | | | | | | 25 | | 5~21 |
| | 8 | 13 | 21 | 14 | 9 | 9 | | 30 | 15 | 33 38 48 58 68 78 88 98 108 118 128 | 5~33 |
| | | | | | | | | | 20 | | 5~31 |
| | | | | | | | | | 25 | | 5~26 |
| | | | | | | | | | 30 | | 5~22 |
| | 10 | 15 | 24 | 17 | 11 | 11 | | 35 | 25 | 38 48 58 68 78 88 98 108 118 128 | 5~28 |
| | | | | | | | | | 30 | | 5~24 |
| | | | | | | | | | 35 | 48 58 68 78 88 98 108 118 128 | 5~21 |
| | | | | | | | | | 40 | | 5~18 |
| | 13 | 17 | 27 | 19 | 14 | 13 | | 40 | 30 | 58 68 78 88 98 108 118 128 138 | 5~26 |
| | | | | | | | | | 35 | | 5~24 |
| | | | | | | | | | 40 | 68 78 88 98 108 118 128 138 | 5~21 |
| | | | | | | | | | 45 | | 5~19 |
| | 16 | 23 | 33 | 25 | 18 | 16 | | 50 | 30 | 78 88 98 108 118 128 138 148 | 5~28 |
| | | | | | | | | | 35 | | 5~24 |
| | | | | | | | | | 40 | | 5~21 |
| | | | | | | | | | 45 | | 5~19 |

Figure43 Standard Parameters

## 3.1 Analyze the Standard Part

Firstly, we should analyze the model, how it is assembled with other components. Then set the location face and location point.

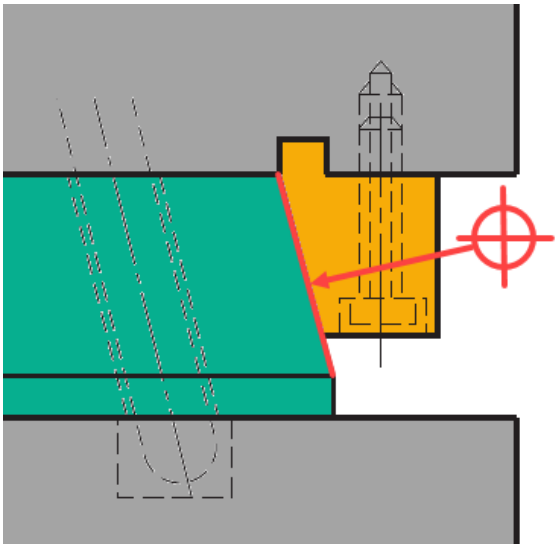


Figure44 Location Face and Point

The Location plane is an inclined plane. So, the plane's negative normal should be the same as the Z axis, and the original point should be the center point of the contact face.

When variable "A" is in different range, the number of threaded holes could be changed. To fulfill this requirement, we need to create a model with maximum number of the screw, then we can easily switch it to another mode by using "Conditional Suppress".

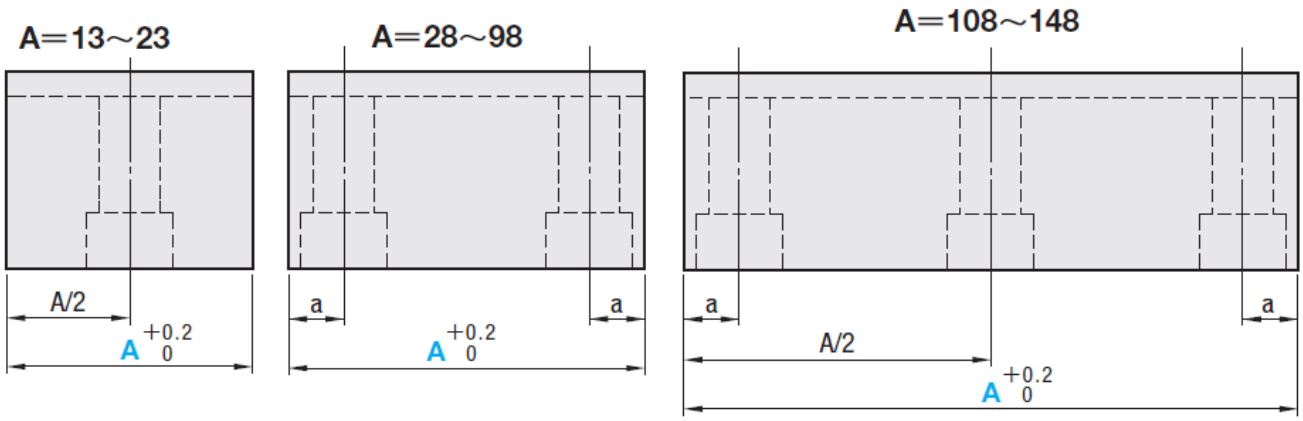



Figure45 Number of Threaded Holes

## 3.2 Build up Variables for the Part

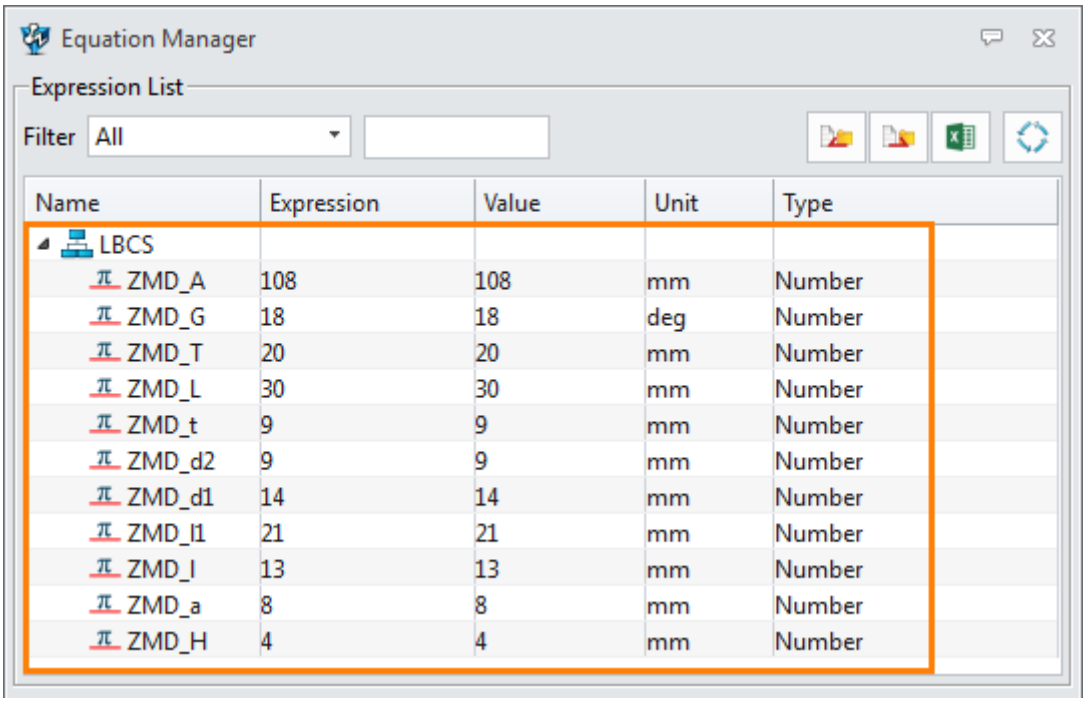
### Step 1. Create a new file

Launch ZW3D, click on "New" command to create a new file named "LBCS".

**Step 2. Create variables**

Tool ribbon tab -> Equation Manager

According to the “LBCS” parameter list, we should create corresponding variables. The results are listed below. After finishing defining variables, click “OK” to close the equation manager.




| Name | Expression | Value | Unit | Type |
|---|---|---|---|---|
| LBCS | | | | |
| ZMD_A | 108 | 108 | mm | Number |
| ZMD_G | 18 | 18 | deg | Number |
| ZMD_T | 20 | 20 | mm | Number |
| ZMD_L | 30 | 30 | mm | Number |
| ZMD_t | 9 | 9 | mm | Number |
| ZMD_d2 | 9 | 9 | mm | Number |
| ZMD_d1 | 14 | 14 | mm | Number |
| ZMD_l1 | 21 | 21 | mm | Number |
| ZMD_l | 13 | 13 | mm | Number |
| ZMD_a | 8 | 8 | mm | Number |
| ZMD_H | 4 | 4 | mm | Number |

Figure46 Variable List

## 3.3 Parametric Design

**Step 3. Create the main shape of position locking block**

Use the “Sketch” command to create a sketch. Define negative X axis as the UP direction and set the YZ datum as the plane to align the sketch. The sketch result is shown in the image below.

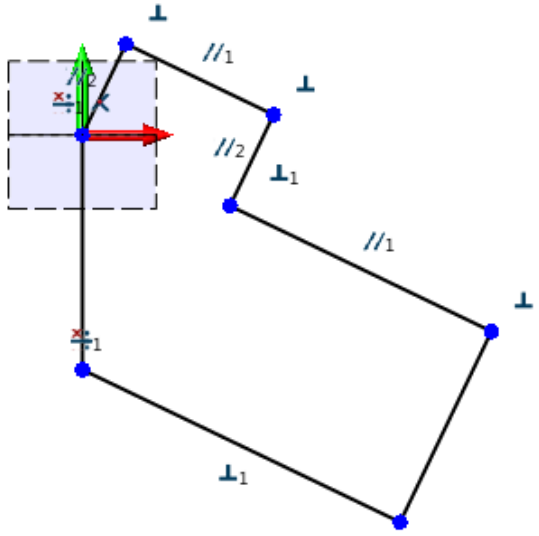


Figure47 Basic Sketch

Add dimensions and constraints to make sure every dimension is driven by the parameter.

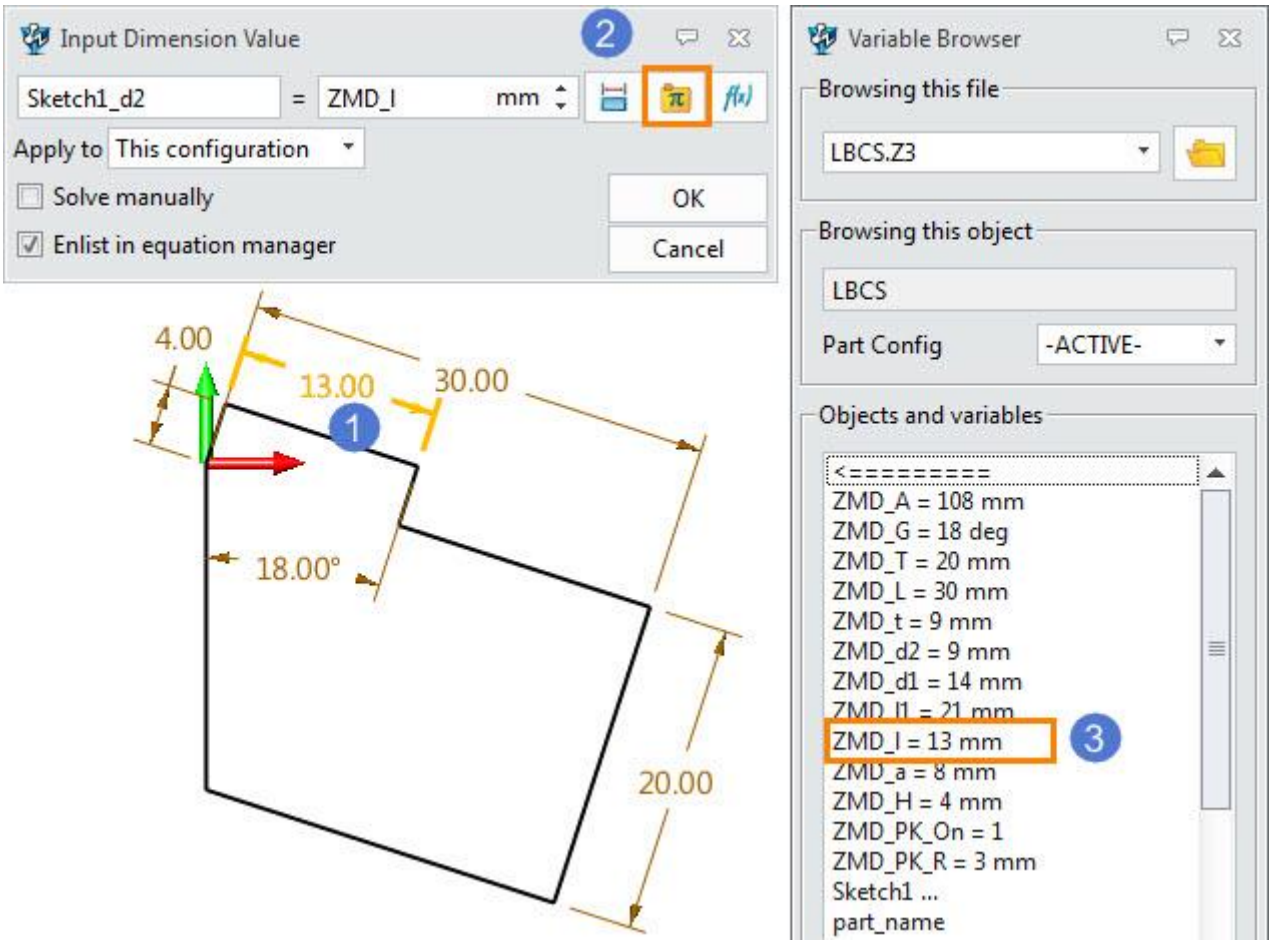



Figure48 Define the Dimension by the Parameter

Use the same way to define other dimensions, the final sketch should be well-defined.

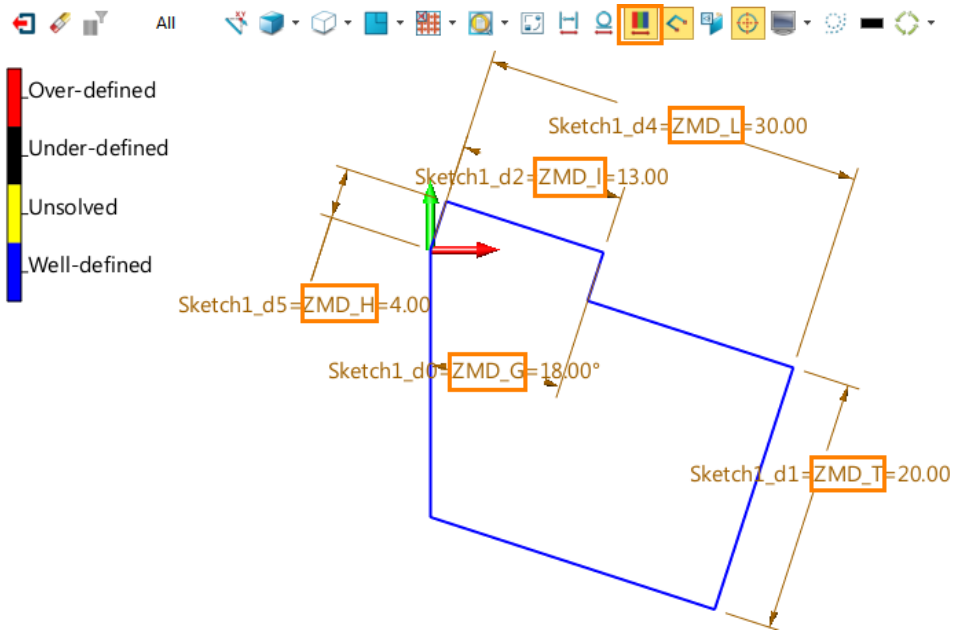



Figure49 Final Sketch

Back to the part level. Open equation manager, then you will find all sketch dimensions are listed in the equation manger.

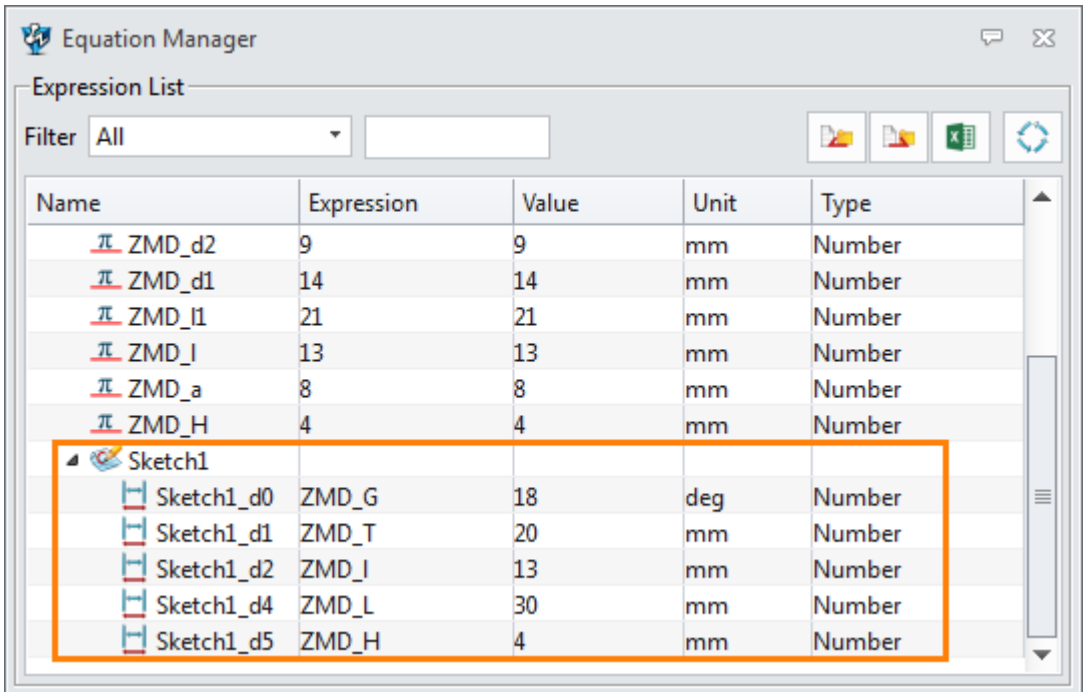



Figure50 Sketch Dimension in Equation Manager

Extrude the sketch to get the main body, set the parameter as shown in the image below.

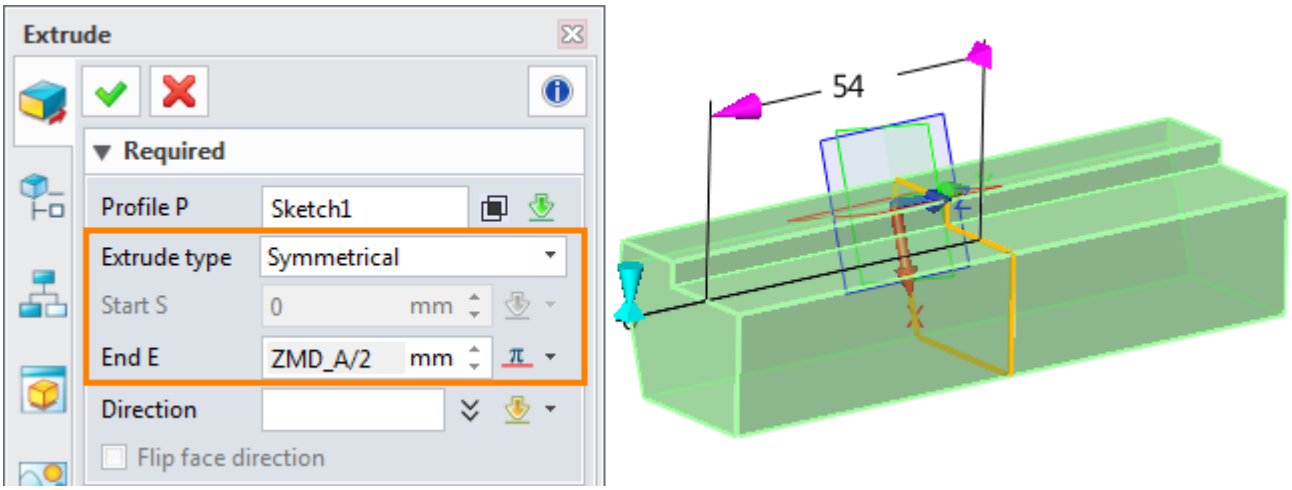



Figure51 Extrude Sketch

**Step 4. Create center hole**

Shape Ribbon Tab->Engineering Feature -> Hole command

Refer to the following image to define this center hole.

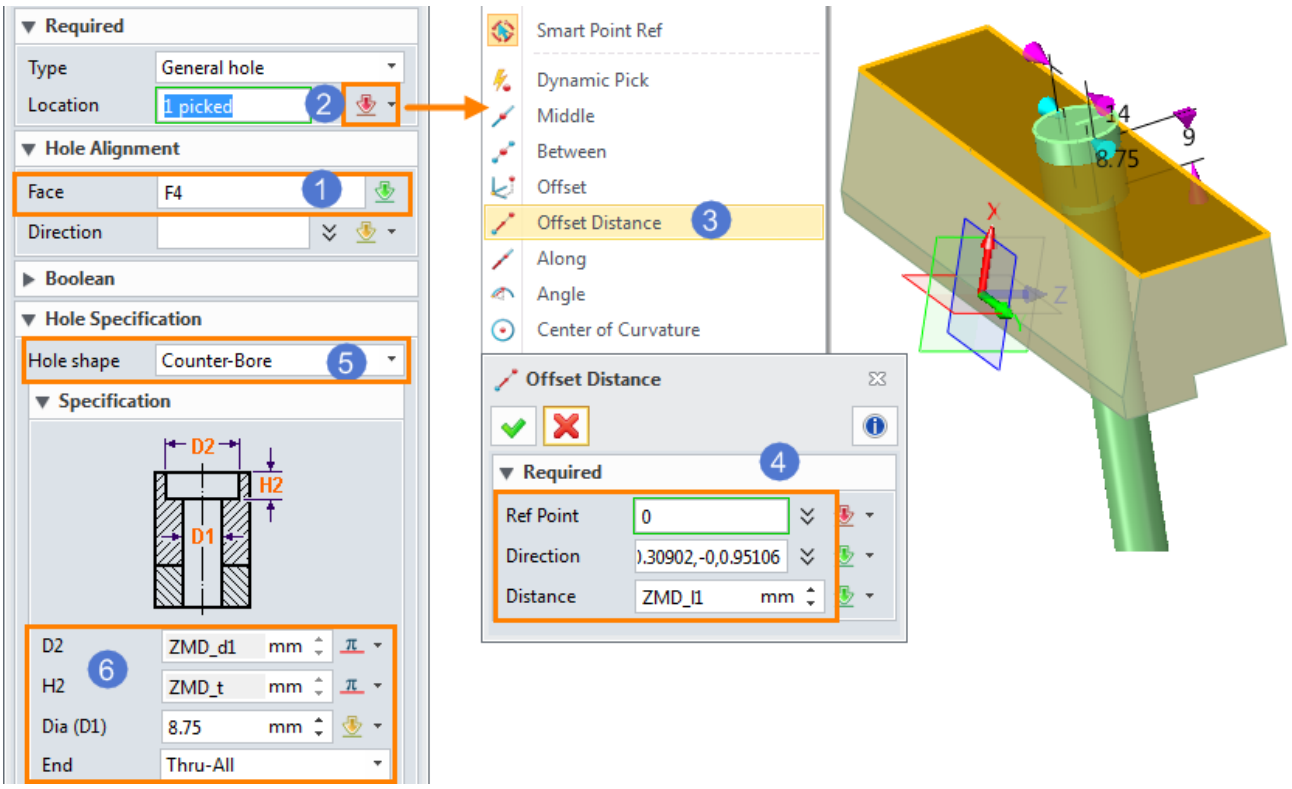



Figure52 Hole Parameters

Firstly, pick the bottom face as the base of hole feature. And then define the location point by "Offset-Distance" method which is driven by the variable (ZMD_l1).

The hole type is Counter-Bore. It is also driven by the variables (ZMD_d1 and ZMD_t).The result is shown in the figure below.

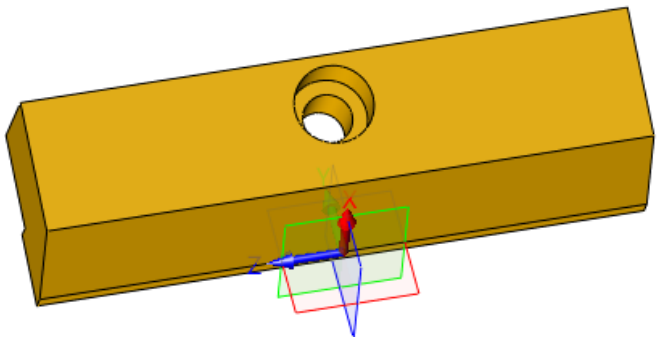


Figure53 Center Hole

**Step 5. Create side holes**

With the similar way to create one side hole. Refer to the image below to set the parameters.

Then mirror the hole feature by XZ datum.

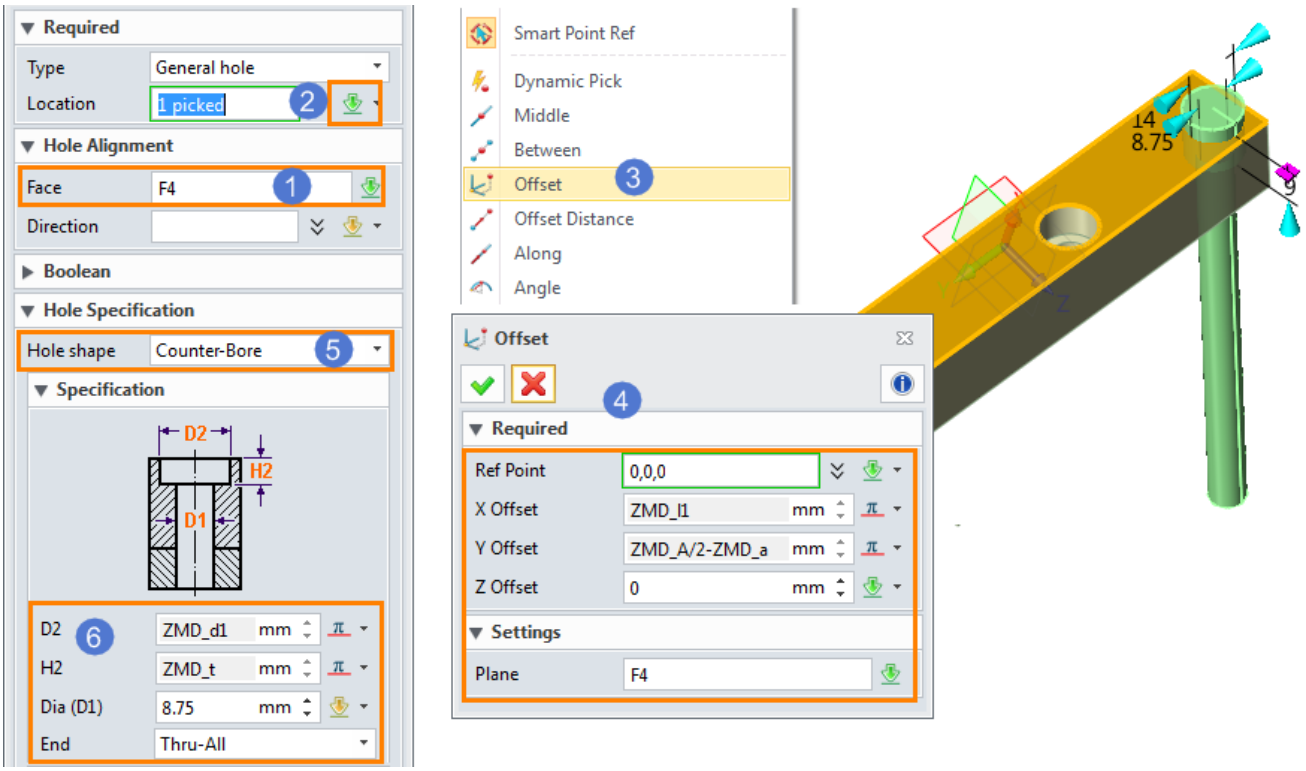



Figure54 Create the Side Hole

The following image shows the result.

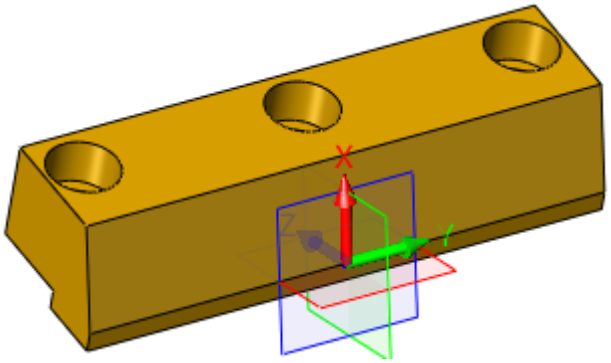


Figure55 Result of the Side Holes

**Step6. Add fillet and chamfer**

Pick one edge to add the fillet (R=2mm), then pick four edges to create the chamfer (C=0.5mm).

The result is shown as the following image.

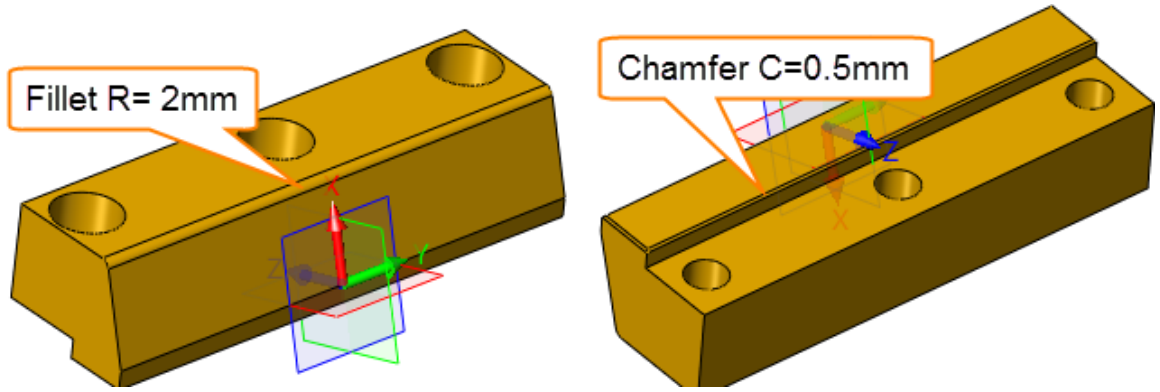



Figure56 Add Fillet and Chamfer

### Step7. Save the file

Save the file into the "Model" folder in "ZWMold" directory. The default path is as below

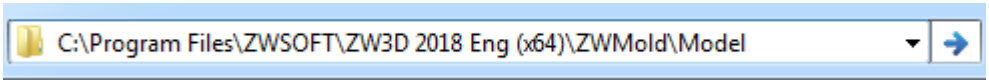



Figure57 Folder Path of Z3 File

### Step 8. Suppress center hole

Firstly, let's review the standard part parameters and find that the model is changed with one variable A. ( variable name is ZMD_A.) It can be achieved by "Conditional Suppress" function.

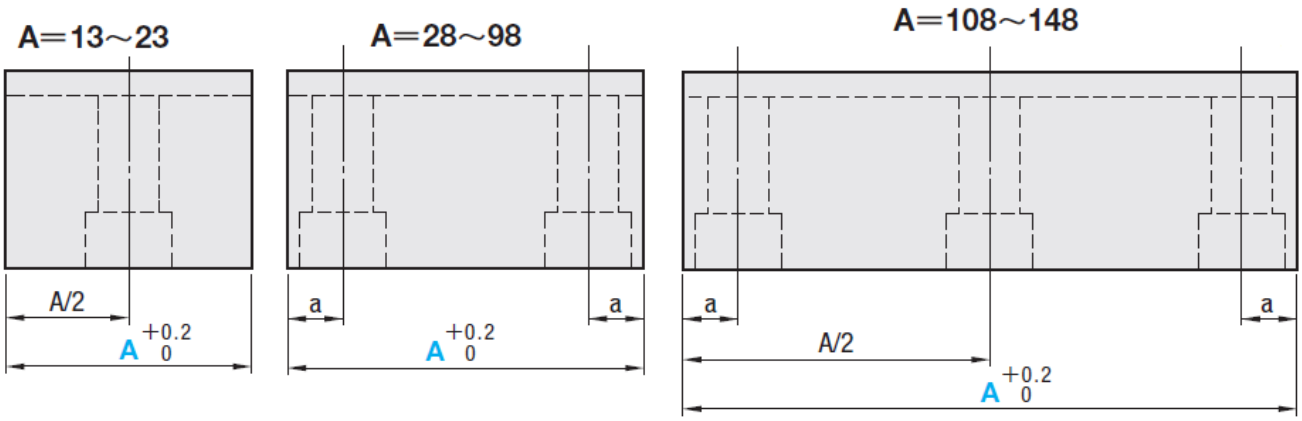



Figure58 Standard Part with Different Status

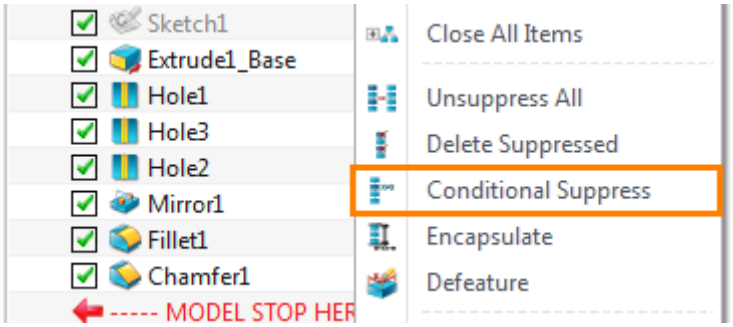



Figure59 Conditional Suppress

Generally, select the feature and then define the expression. When the expression is true, the feature will be suppressed.

Check the hole1, input expression “(ZMD_A>27)&(ZMD_A<99)”, which means that when the value of ZMD_A is from 28 to 98, “Hole1” will be suppressed.

The current value of ZMD_A is 108, so the expression is False, the hole1 is not suppressed.

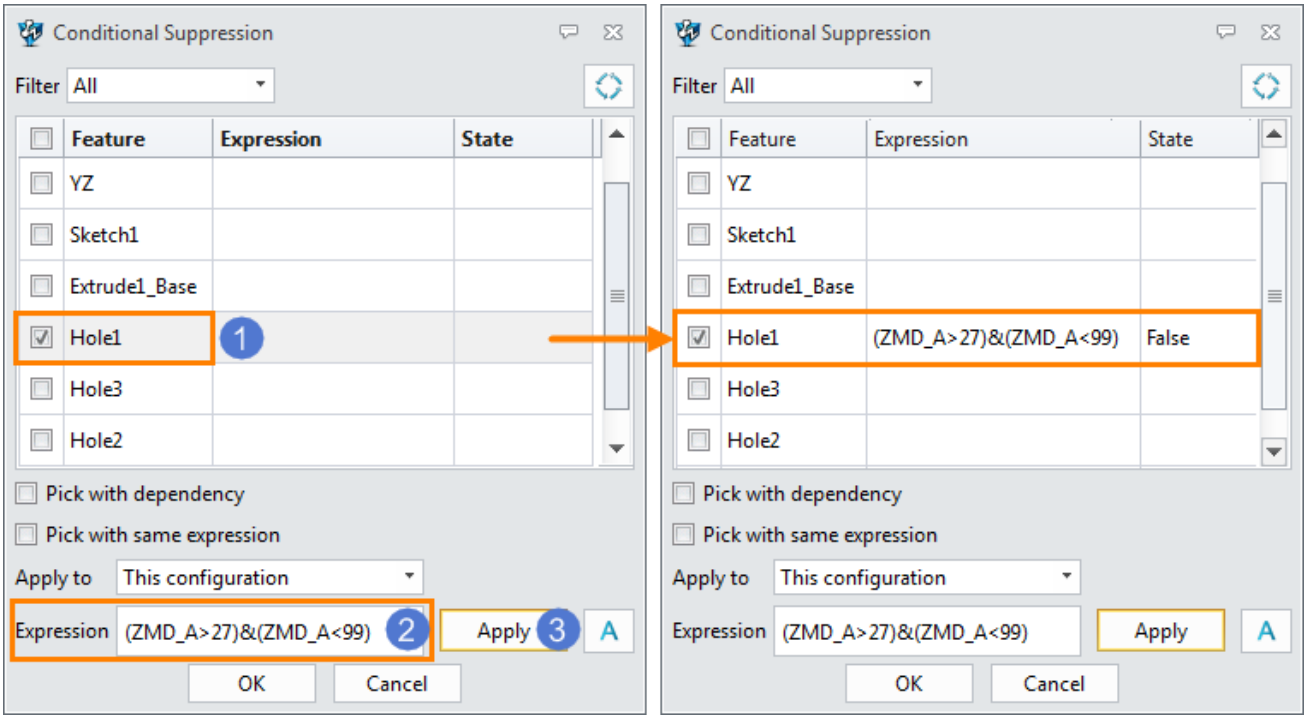



Figure60 Conditional Suppression of Center Hole

Check the history manger. The feature with conditional suppression has the different marker.

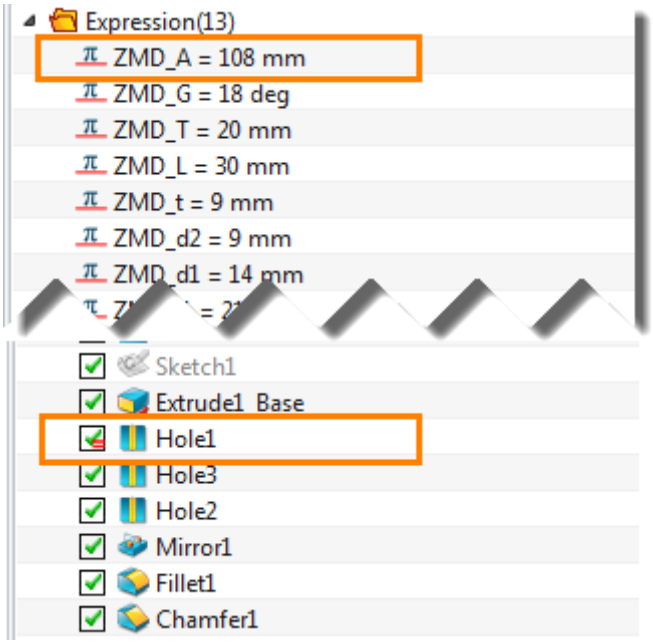



Figure61 Hole1 with Conditional Suppression

### Step 9. Suppress side holes

In the same way, we can quick set “Conditional Suppress” for the “Hole2” and “Mirror1”. The expressions are shown as below.

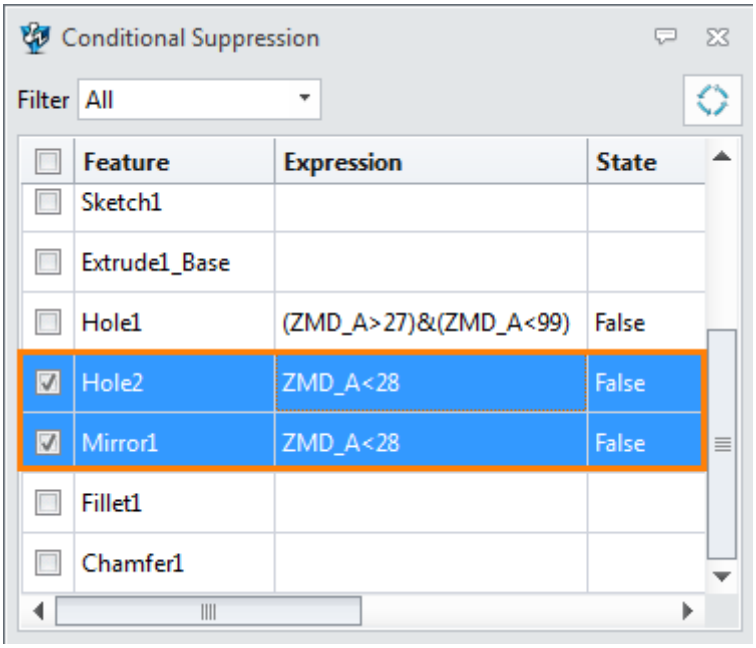



Figure62 Conditional Suppress for Side Holes

The current value of ZMD_A is 108, so the expressions are false. “Hole1”and “Mirroe1” features arebe marked as the “Conditional Suppress” features, but not in the suppress state.

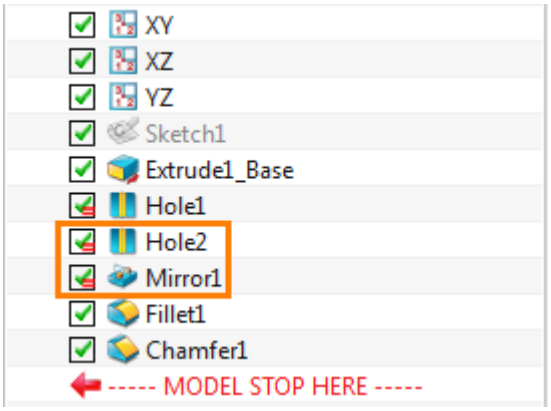



Figure63 Hole2 and Mirror with Conditional Suppression

### Step 10. Check the availability of the “Conditional Suppress”

Double click on “ZMD_A=108” equation and change the value to 60.

Then click “Regen” command  on the top left corner of the software.The “Hold1” is suppressed, and the model has been updated. The “Conditional Suppress” works.

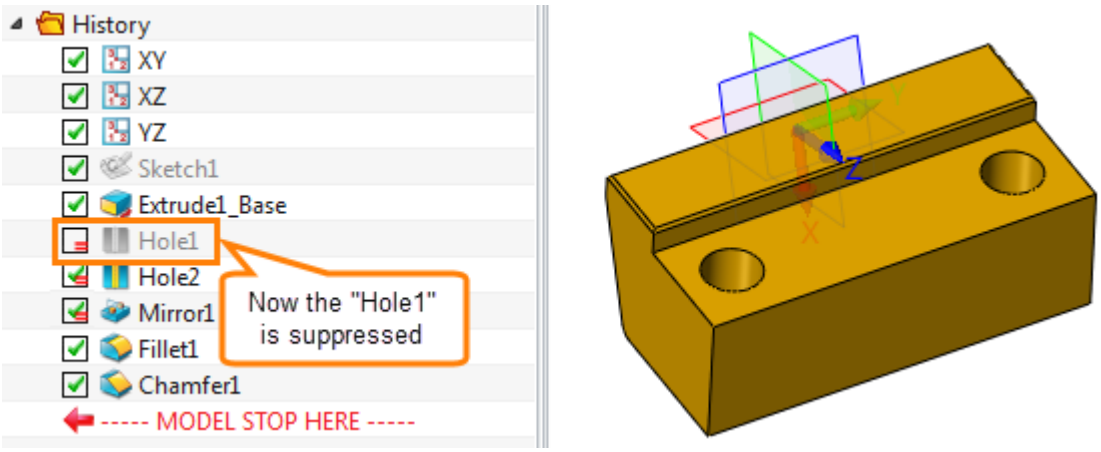



Figure64 Standard Part with ZMD_A=60

In the same way, change the value of ZMD_A to 20, then regen the model.

The “Hold2” and “Mirror1” suppressed. The “Conditional Suppress” works. Save the file.

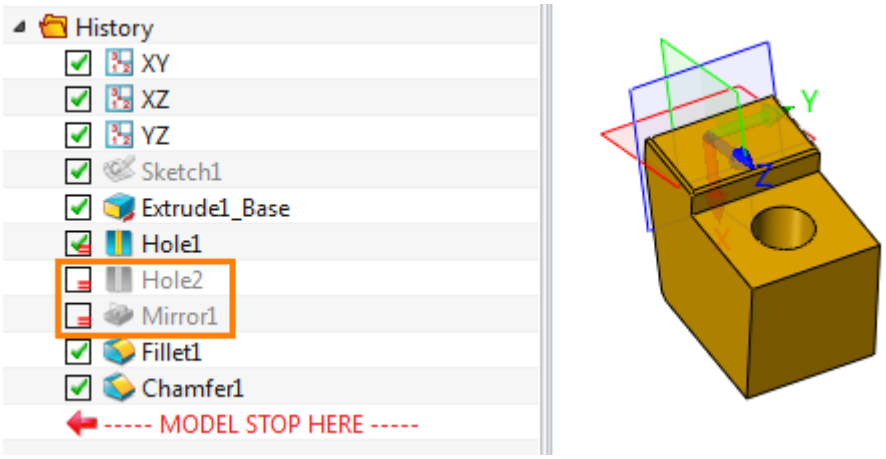



Figure65 Standard Part with ZMD_A=20

**Step 11. Create variables for pocket**

Open “Equation Manager”.

Create a variable of the constant type, named “ZMD_PK_On”, set its value as “1”. Add some description: "1" means pocket is on, "0" means pocket is off”. It is used for switching pocket states.

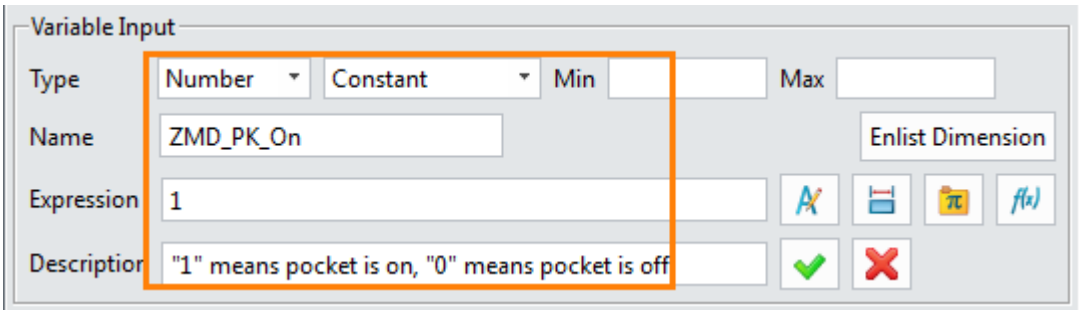



Figure66 Variable ZMD_PK_On

Create a variable “ZMD_PK_R”, set its value as “3”. Describe it as “angle-clearing radius”.

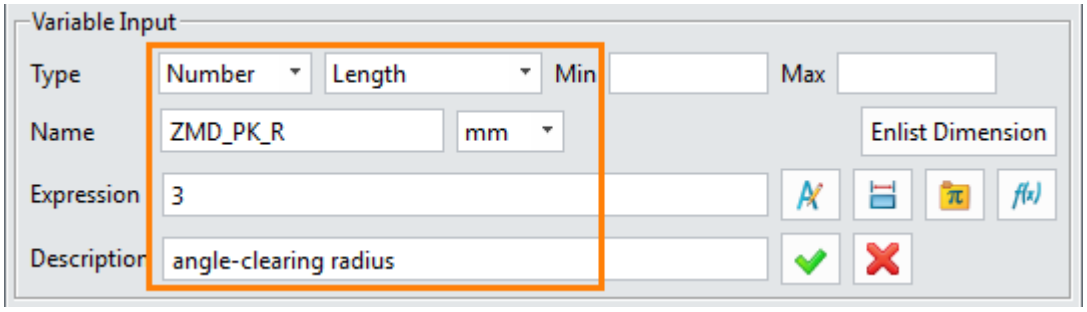



Figure67 Variable ZMD_PK_R

**Step 12. Create the main shape of the pocket**

Draw the sketch2. Select YZ datum to align the sketch and set -X axis as the UP direction.

Refer to the standard part to draw the pocket sketch, as shown in the image below.

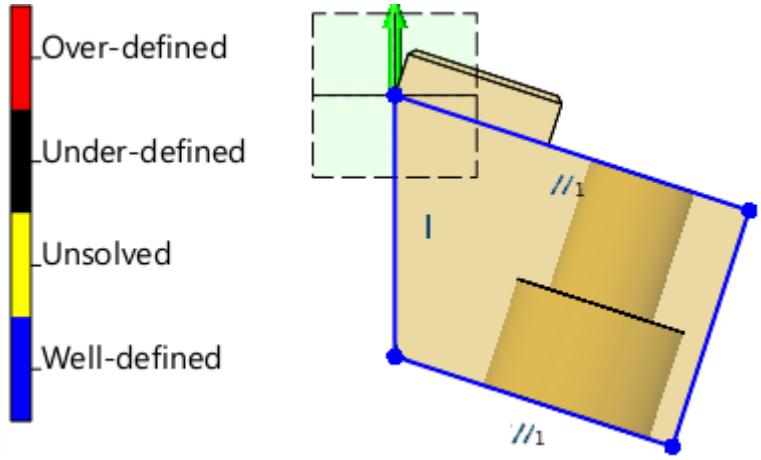



Figure68 Well-defined Sketch for Pocket

Extrude the sketch with symmetrical type. Extruded value is ZMD_A/2+1.5(mm).

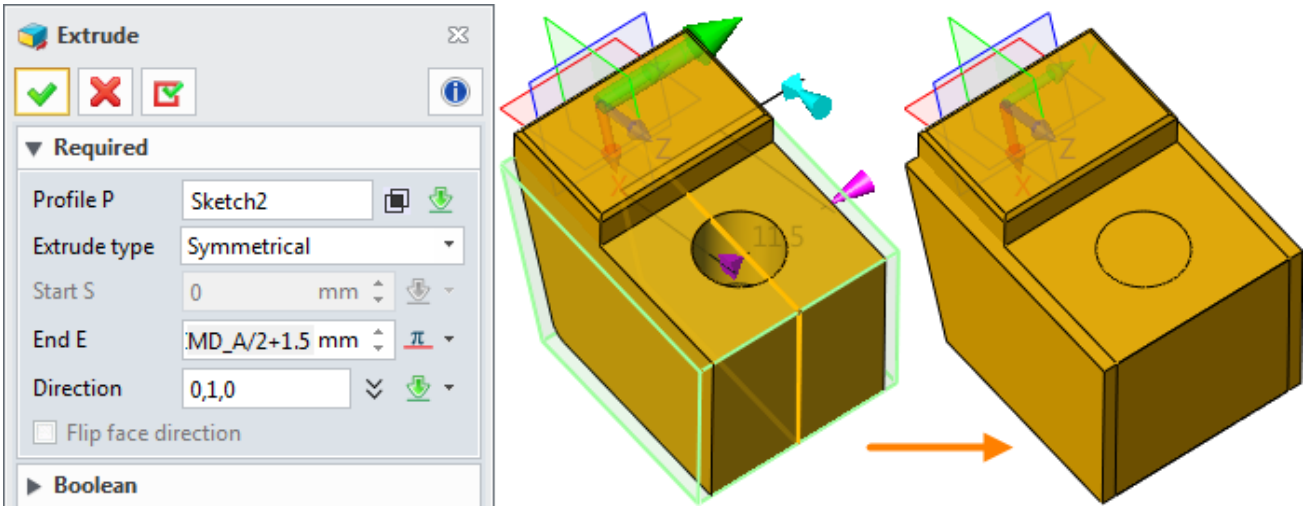



Figure69 Pock Model

**Step 13. Change the display attribute of the pocket**

Right click on the pocket shape then select the “Face Attributes”.

Change face color and transparency.

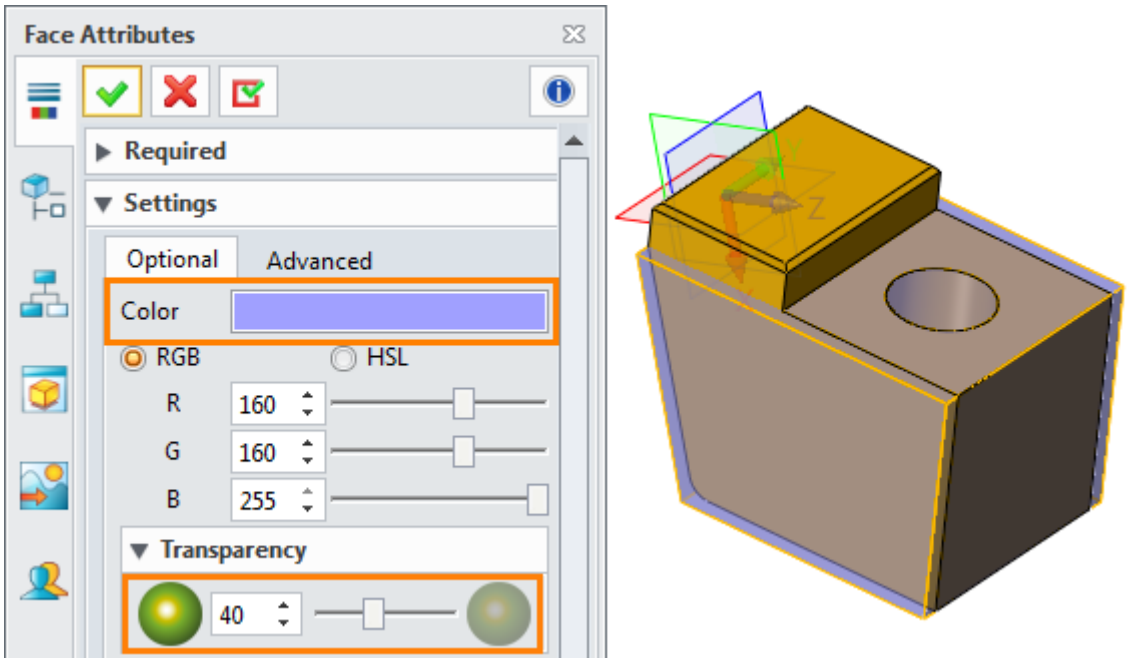



Figure70 Change Face Attribute for the Pocket

**Step 14. Create pocket for insert-portion**

Pick the top face of standard part as the plane of new sketch.

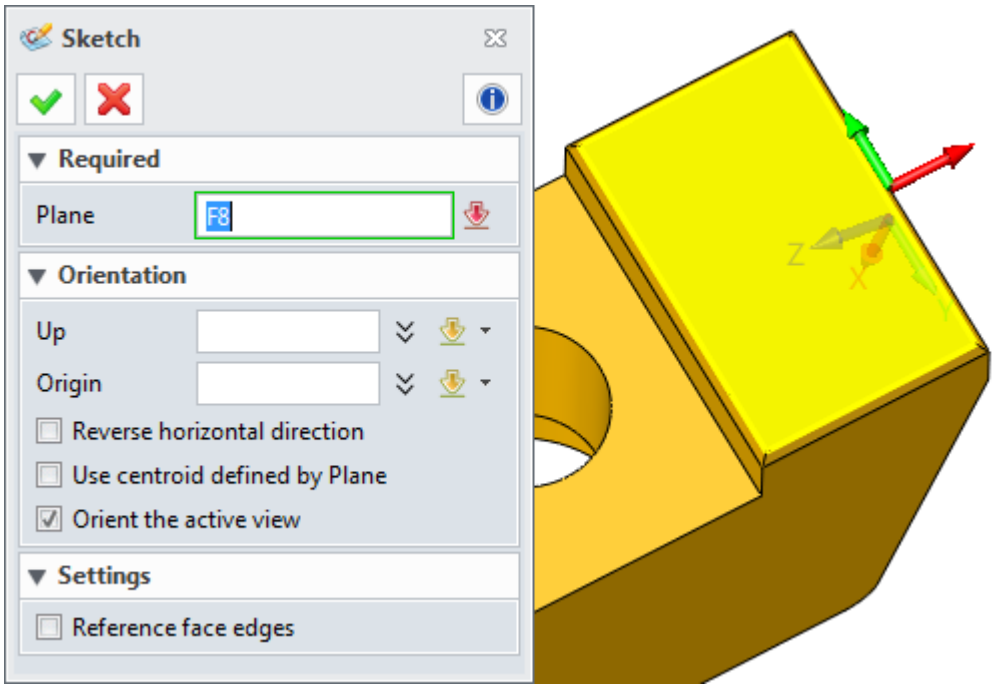



Figure71 New Sketch Plane

Select “Reference” command,  then define the reference curves by picking four edges, as shown in the image below.

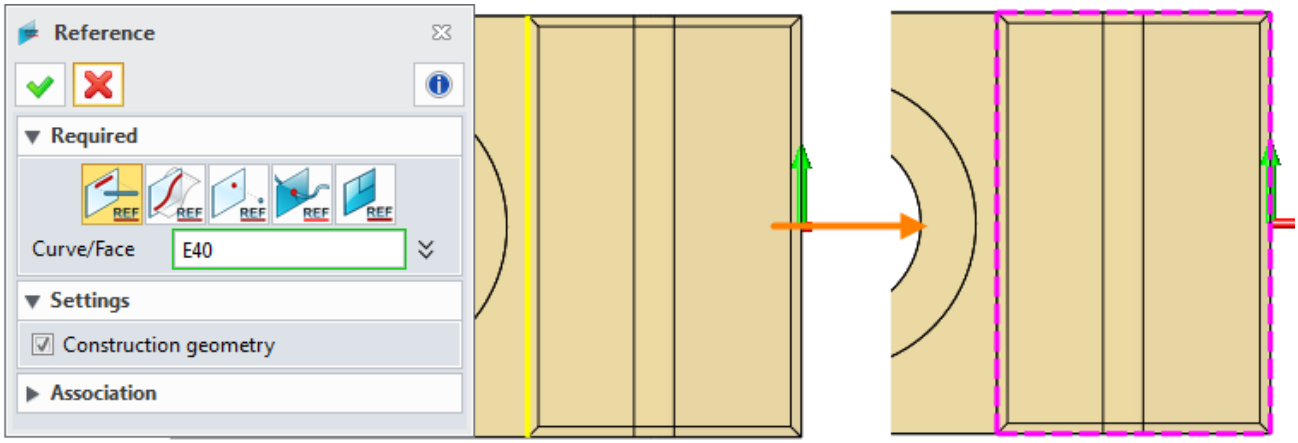



Figure72  Define the Reference Curves

Pick them all, then right click.

Use “Toggle Type” to change the reference curve (construction geometry) to 2D geometry.

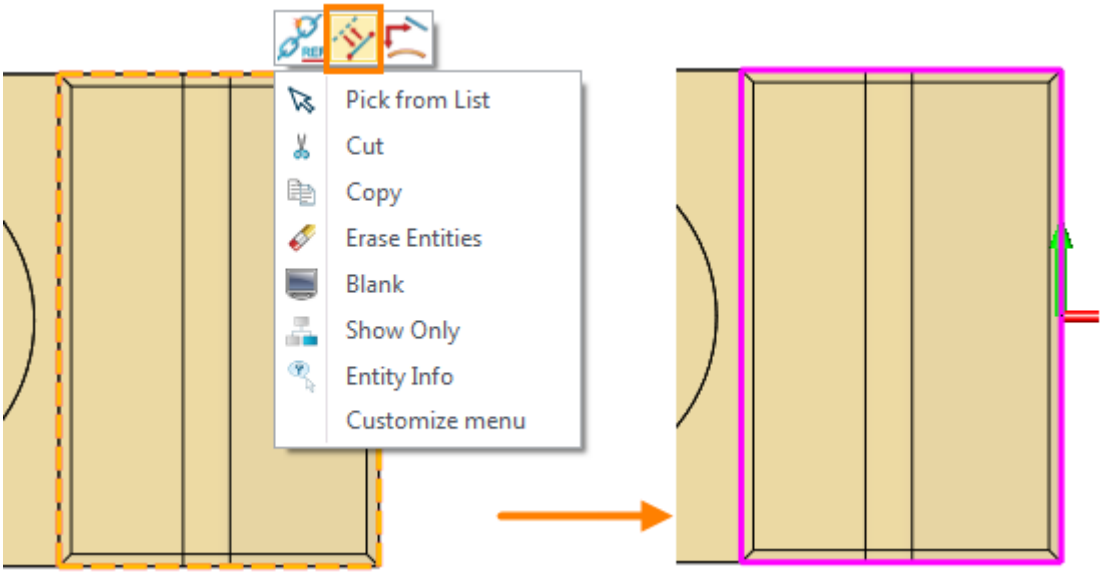



Figure73  Toggle Reference Curve Type

Next, create the clear corners.

Firstly, create two construction lines, as shown in the image below. The angle of horizontal line and construction line is 45°. And length is dirven by the expression (ZMD_PK_R- Gap value ). Generally, Gap value is from 0.5 to 1mm.

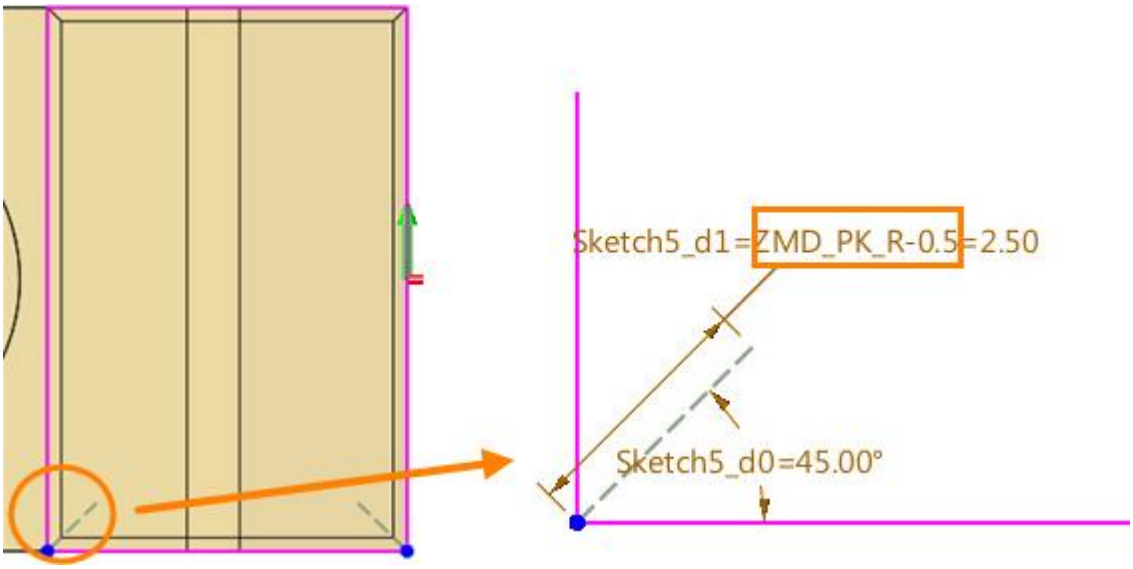



Figure74 Constrction Lines

Create the circles on the end point of the construction lines, which radius both are ZMD_PK_R.

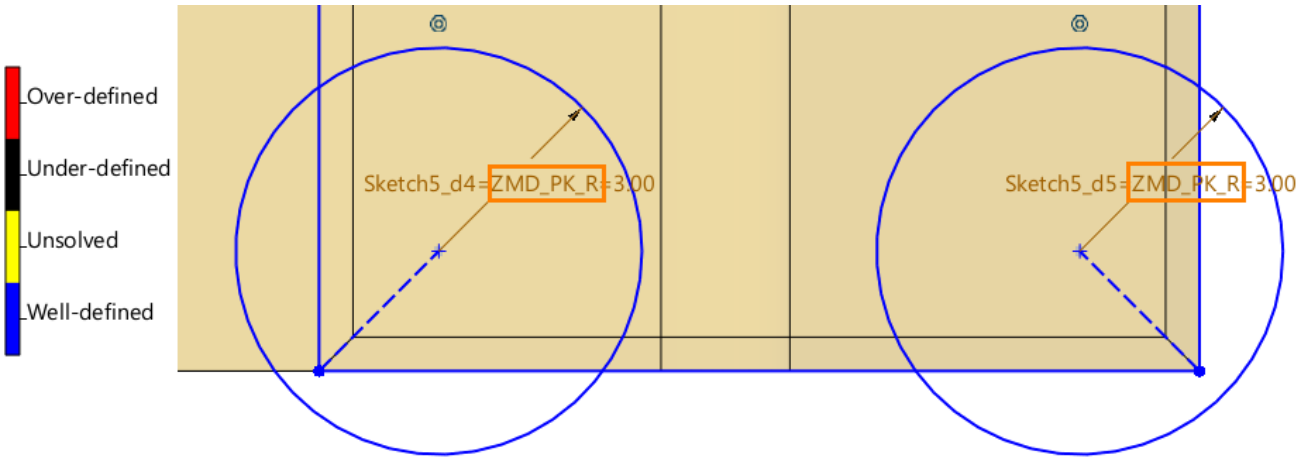



Figure75 Circles

Then, mirror these two circles with X axis. At last, create a trace profile by picking outside geometry with “Trace Profile” command.

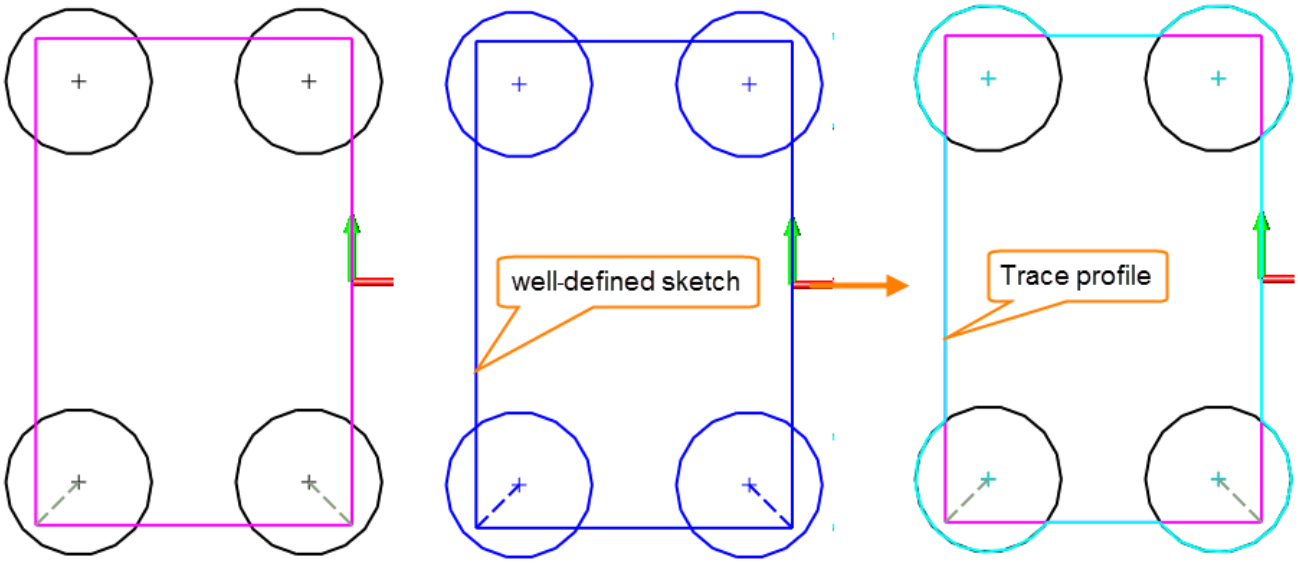



Figure76 Trace Profile

After finishing the sketch, extrude the sketch and combine it with pocket shape. Set parameters as below.

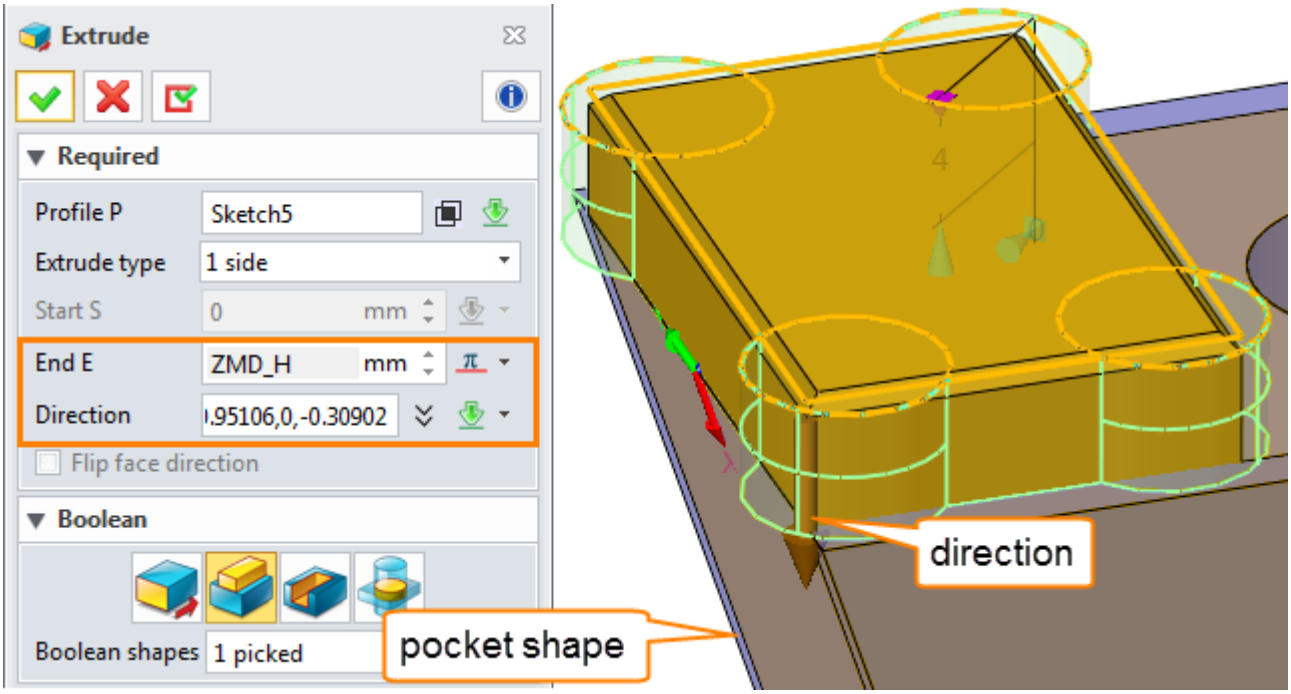



Figure77 Extrude the Sketch and Combine with Main Pocket Shape

**Step 15. Specify the tag for pocket**

Right click on the pocket shape, then click “Attach Name Tag to Entity” command.

Name “Pocket” to created pocket shape.

At last, blank the pocket shape and save the file.

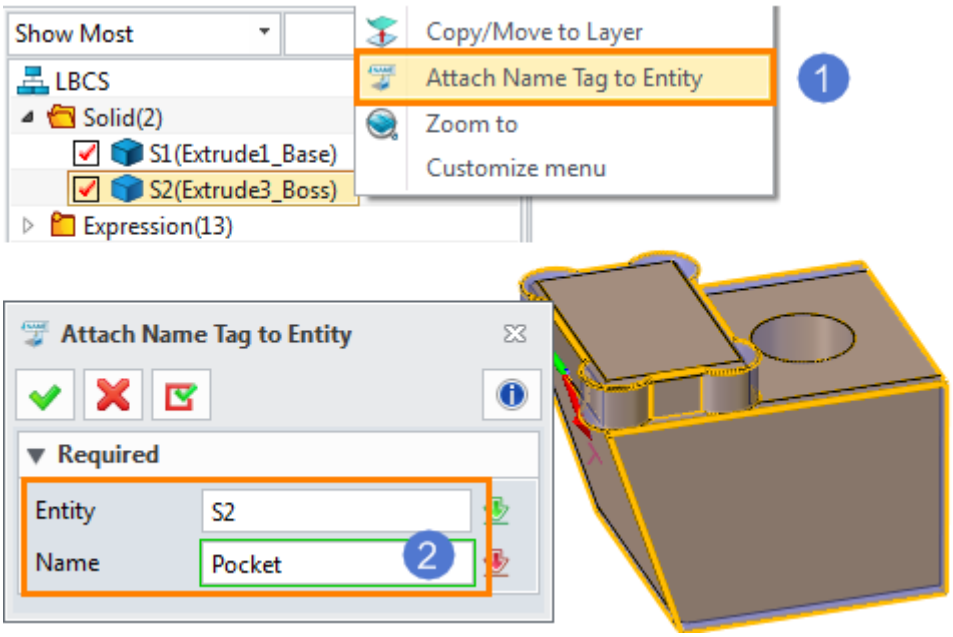



Figure78 Name Pocket to Pocket Solid

## 3.4 Input Data

Before inputting data, we need to create a new folder to save the files.

Review the parameter table.

■Inlay part H=4mm

| H | a | ℓ | ℓ1 | d1 | d2 | t | Part Number Type | Part Number L | T | A | G° 1° increments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | 6 | 6 | 13 | 9.5 | 5.5 | 6 | LBCS | 20 | 10 | 13 15 18 23 28 33 38 48 | 5~33 |
| | | | | | | | | | 15 | 13 15 18 23 28 33 38 48 58 | 5~24 |
| | | | | | | | | | 20 | | 5~18 |
| | 7 | 10 | 17 | 11 | 6.5 | 7 | | 25 | 10 | 18 23 28 33 38 48 58 68 78 88 98 | 5~33 |
| | | | | | | | | | 15 | 18 23 28 33 38 48 58 68 78 88 98 108 | 5~33 |
| | | | | | | | | | 20 | | |
| | | | | | | | | | 25 | | |
| | 8 | 13 | 21 | 14 | 9 | 9 | | 30 | 15 | | |
| | | | | | | | | | 20 | | |
| | | | | | | | | | 25 | | |
| | | | | | | | | | 30 | | |
| | 10 | 15 | 24 | 17 | 11 | 11 | | 35 | 25 | | |
| | | | | | | | | | 30 | | |
| | | | | | | | | | 35 | | |
| | | | | | | | | | 40 | | |
| | 13 | 17 | 27 | 19 | 14 | 13 | | 40 | 30 | | |
| | | | | | | | | | 35 | | |
| | | | | | | | | | 40 | | |
| | | | | | | | | | 45 | | |
| | 16 | 23 | 33 | 25 | 18 | 16 | | 50 | 30 | | |
| | | | | | | | | | 35 | | |
| | | | | | | | | | 40 | | |
| | | | | | | | | | 45 | | |

File_Bom | Components | Parameters | Datalist

| Name | Title | Description | OnlyRead | Advanced | Class |
|---|---|---|---|---|---|
| ZMD_H | H | | ☑ | ☐ | 0 |
| ZMD_a | a | | ☑ | ☐ | 0 |
| ZMD_l | l | | ☑ | ☐ | 0 |
| ZMD_l1 | l1 | | ☑ | ☐ | 0 |
| ZMD_d1 | d1 | | ☑ | ☐ | 0 |
| ZMD_d2 | d2 | | ☑ | ☐ | 0 |
| ZMD_t | t | | ☑ | ☐ | 0 |
| ZMD_L | L | | ☐ | ☐ | 0 |
| ZMD_T | T | | ☐ | ☐ | 0 |
| ZMD_A | A | | ☐ | ☐ | 0 |
| ZMD_G | G | | ☐ | ☐ | 0 |
| ZMD_PK_On | Create Pocket | | ☐ | ☑ | 0 |
| ZMD_PK_R | PR | | ☐ | ☑ | 0 |

Figure79 Parameter Table

"L", "T" and "A" are the selectable parameters, "G" is the editable one, the others are the "only-read" parameters. So, the order of them is as below.

Let's follow the below steps to input data.

**Step 1. Create the whole file path for the component**

Create a folder named "ZW Standard", then create a folder named "Slider" inner it to settle down the par file. Create a folder named "Image" inner the "Slider" to save the image file.

The final path is as below shown.

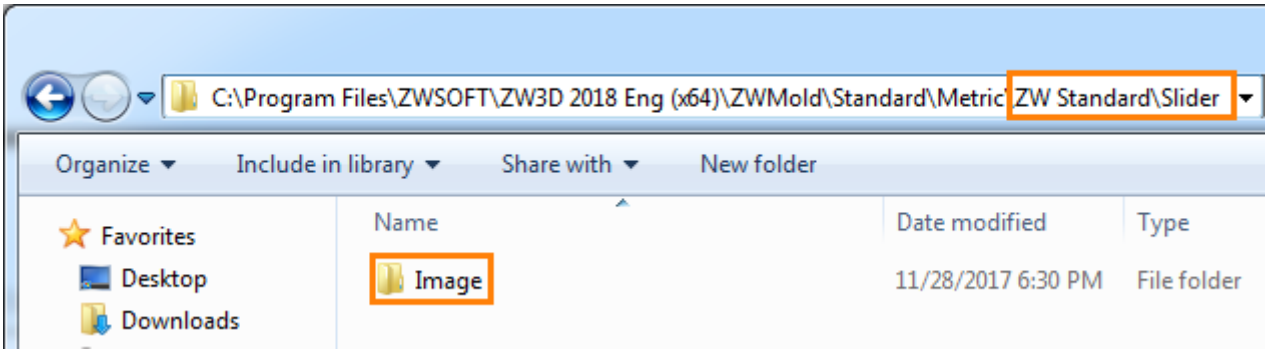



Figure80 Path of Slider and Image

**Step 2. Create a new par file for inputting data**

Launch ZW3D, create a new file. Use "Customize" command Customize in the mold module to input data. Find the "Slider" file path, as shown in the figure below.

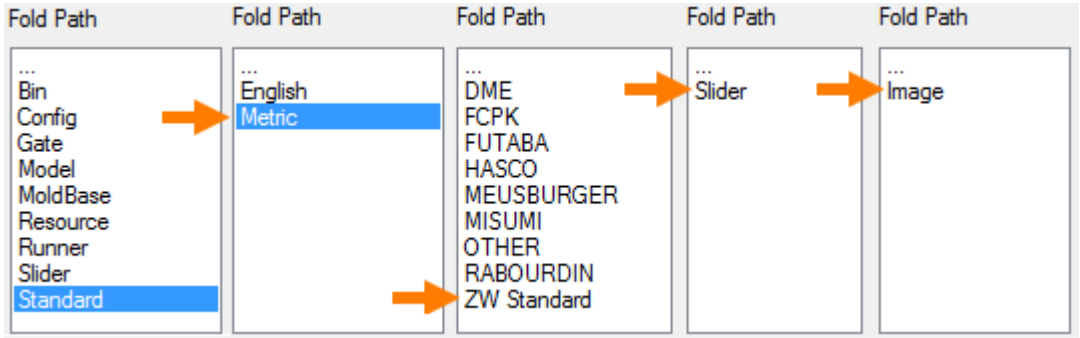



Figure81 Access to Right Folder Path

**Step 3. Click "Add New File" button to create a new file named "LBCS"**

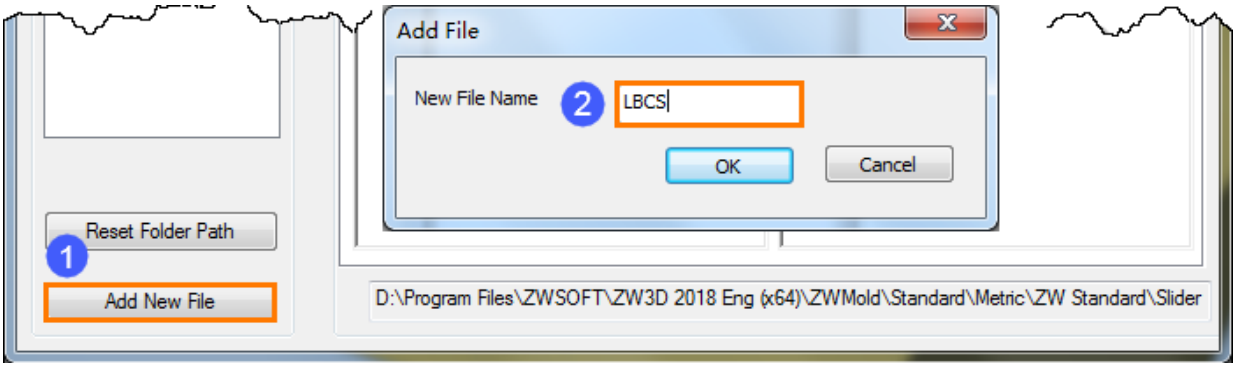



Figure82 Create a New Par File

Click “OK”, the result is as below. And the *.par file has been created in the “Slider” folder.

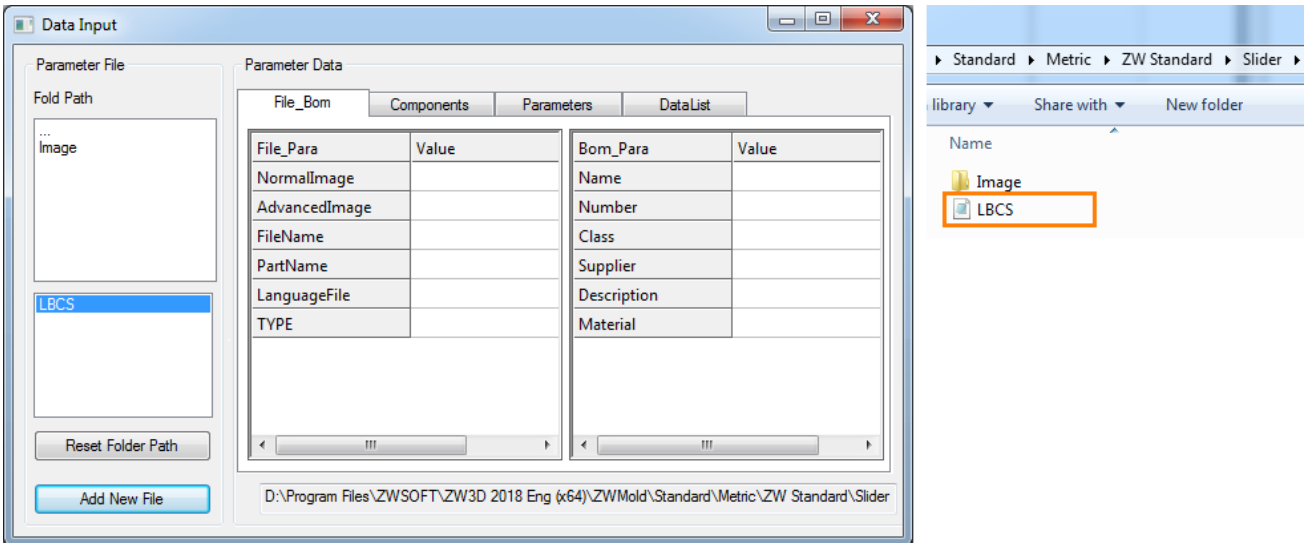



Figure83 Created Par File

**Step 4. Manually input parameter data**

Assign the image, file name and part name, set the type of standard part and fill BOM information, as shown in the figure below.

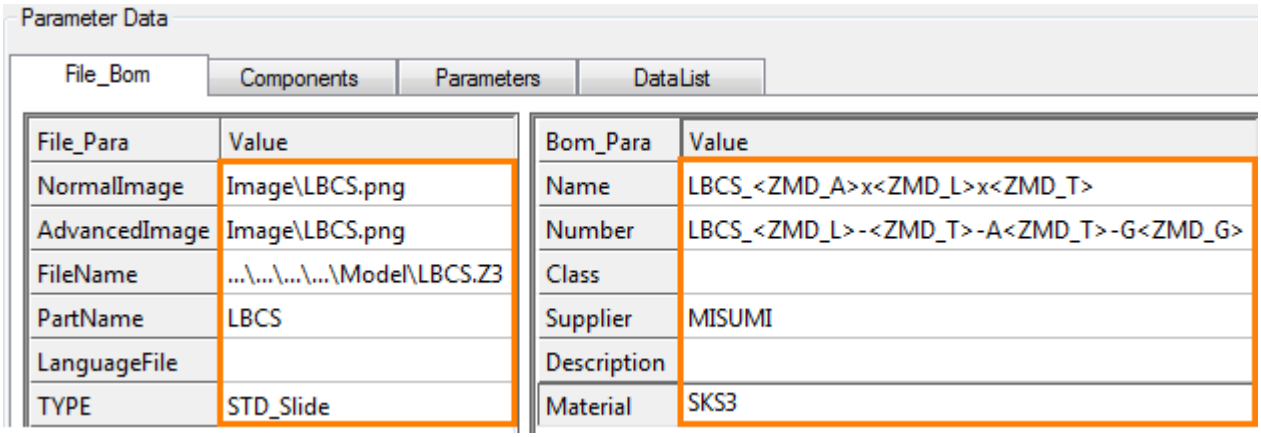



Figure84 Parameter Data

“Name” is the instance name of the part.

“Number” can refer to the booking method of MISUMI, like the below image shown.

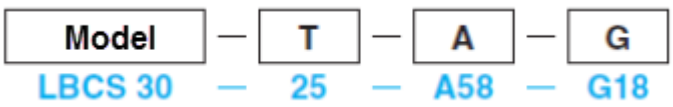



Figure85 Name Format Sample

**Step 5. Create parameters for variables**

In parameter tab, create the same parameters with variable name defined in standard part.

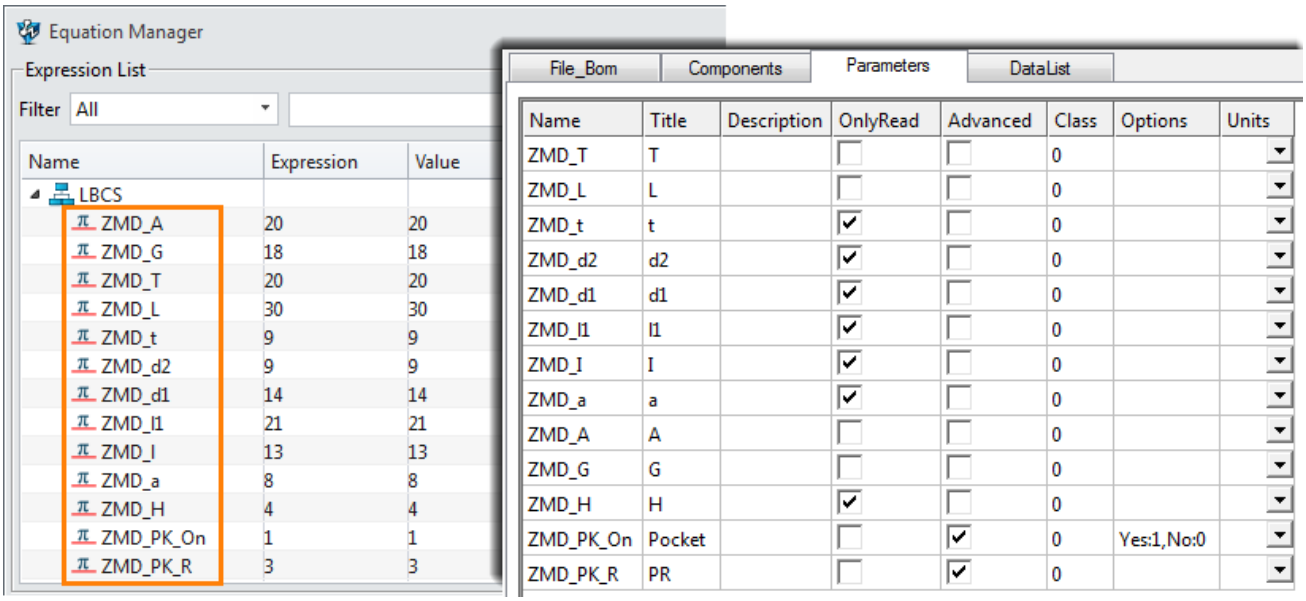



Figure86 Variables VS Parameters

The “ZMD_L”, “ZMD_T”, “ZMD_A” and “ZMD_G” are not the “Only Read” parameters, the “ZMD_PK_On” and “ZMD_PK_R” are the advanced parameters.

### Step 6. Fill the data list

In DataList tab, input parameter value according to the data from MISUMI. Then save it.

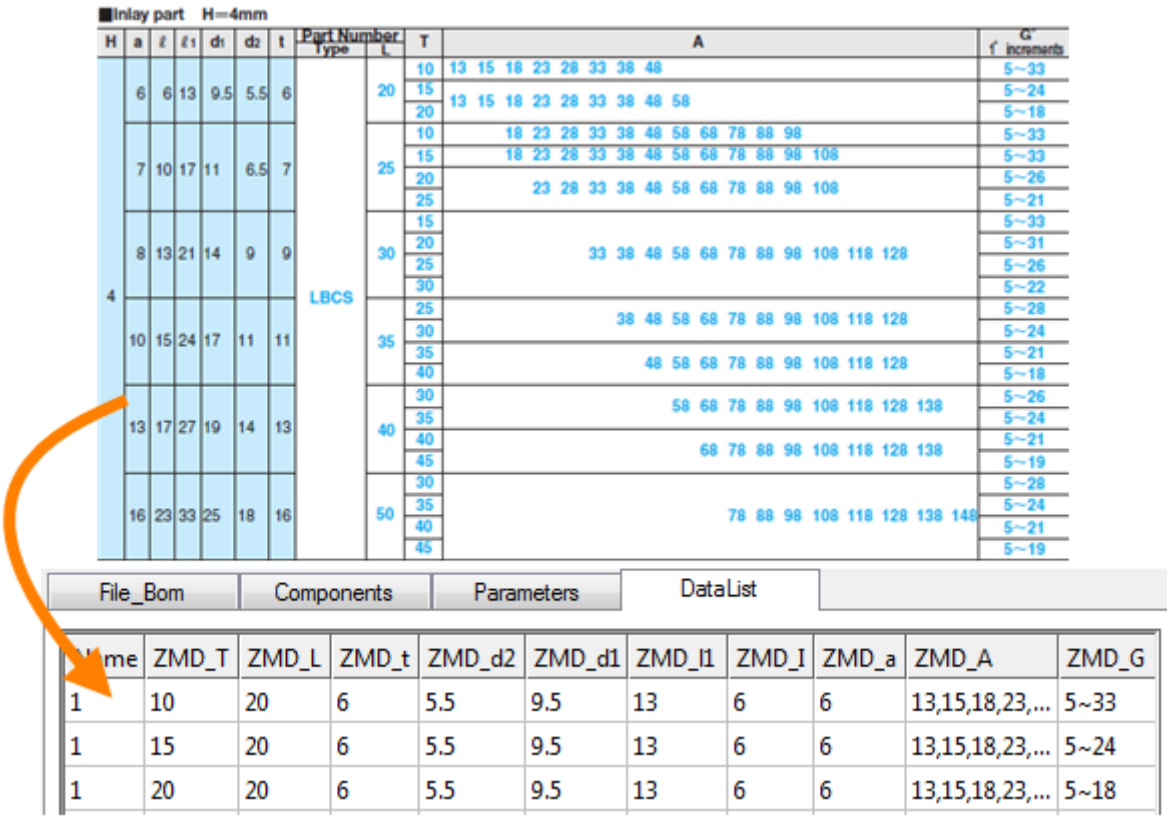



Figure87 Input Parameter Value in Data List

## 3.5 Part Validation

Use “General” command to insert the standard part into the model for checking.

Select “ZW Standard” as the supplier, “Slider” as the category, and “LBCS” as the type. Then, define the insertion face & insertion point and other parameters.

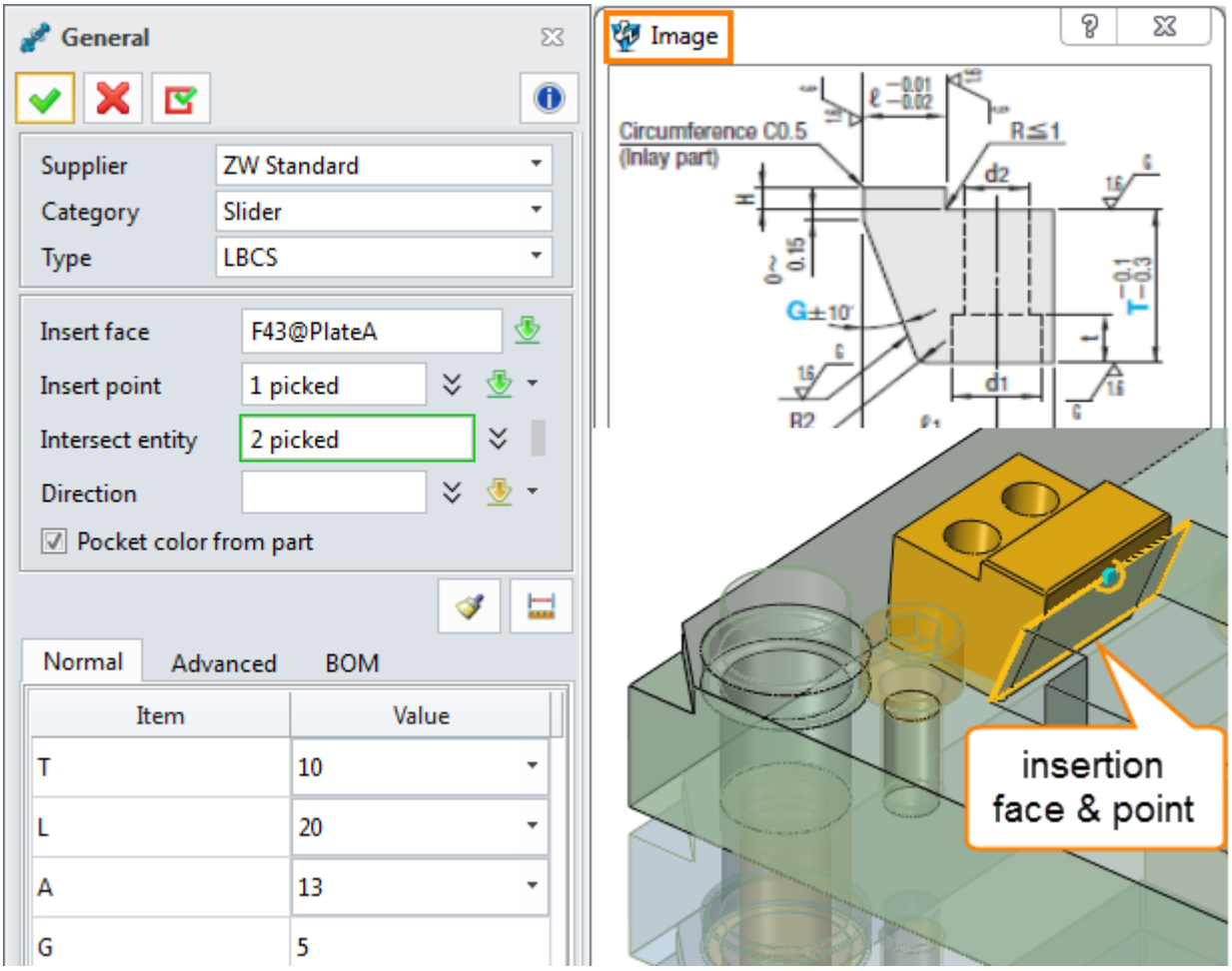



Figure88 Insert the Slider

Define the normal parameters and advanced parameters.

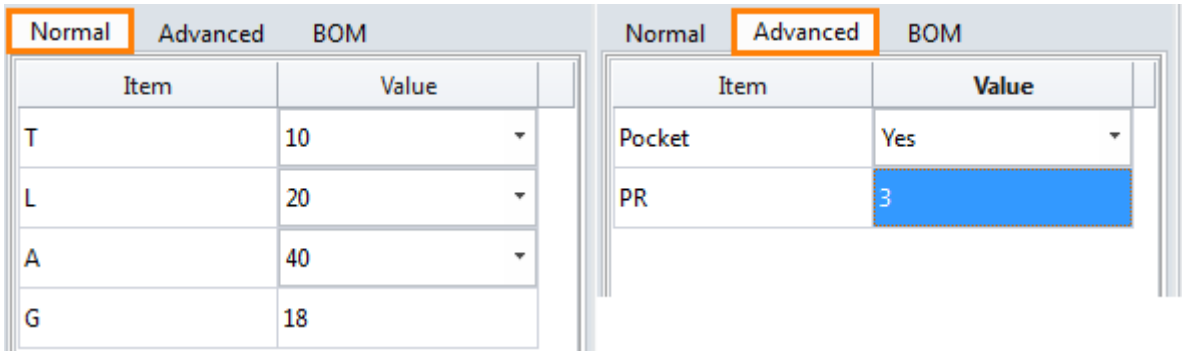



Figure89 Parameters

Click ok to get the result, as shown in the figure below. The pocket is automatically created.

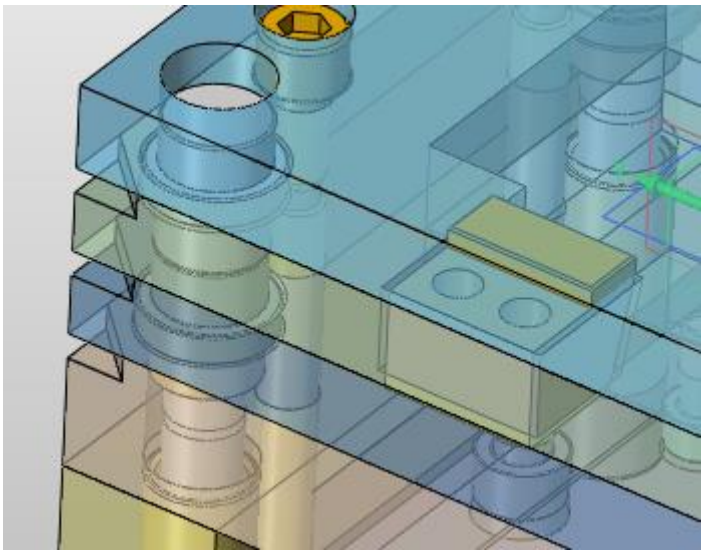


Figure90 Result of the Insertion

**Summary:**

Through this detailed case, detail process of mold standard part customization is introduced. File management, model design and data input are three key parts. By this tutorial, more standard parts can be customized to meet different demands and speed up the mold design.