Intelligent Fastener Extension 3.0
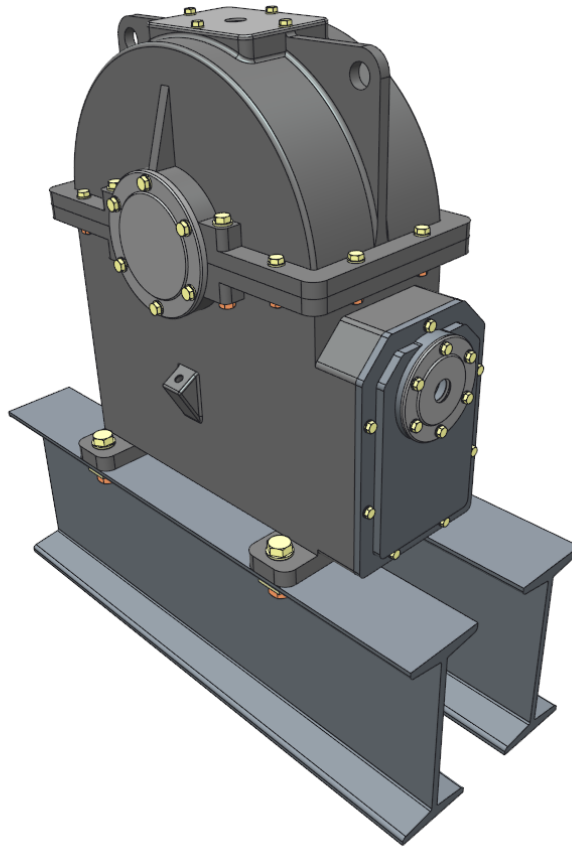

Trainings-Guide

IFX 3.0

Part 3:

Include existing parts & Customizing (Full Version)

Table of Content

1 Introduction

1.1 Objective of this document

The objective of this document is to enable you to create a customized library for the new **Intelligent Fastener Extension (IFX).**

1.2 Conventions

This Training-Guide uses the following conventions:

Assemble by mouse click	An Icon with text shows you, that you will have to select the shown command in the ribbon or in a dialog
Example	Bold font indicates important information
MMB	Middle mouse button
IFX	Intelligent Fastener Extension

2 Include existing Parts into the Library

In **IFX** it is of course possible to customize the library. Not only is it possible to customize the default parts, but also to integrate your own standards.

It is recommended to do an analysis of your existing library. All screws, nuts, washers and pins should be collected and the required information should be stored in a file of your choice (excel, CSV, etc.)

This file should include the following information:

- Filename
- Diameter
- Length
- Units (mm/inch)
- Desired counter bore standard
- Material (8.8; 10.9, etc.)
- Required ID's (important for placement with **IFX**)

   This ID's are:

   • SURFACE (e.g. Screw head surface)
   • AXIS(Rotation Axis of the part)
   • Optional: ORIENT (if the part should have a certain rotation – e.g. lifting eye screw)
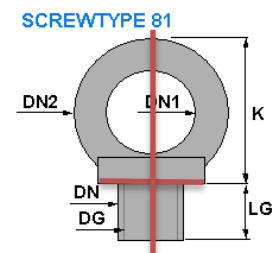
The required ID's can be determined via the IFX functionality:

Intelligent Fastener → Instance creator → Get ID

- Required Dimensions (important for preview):
  You can find the required dimensions in the screw type images. See 2.1 for further explanation.

2.1 Integrating existing parts (single files)

In this section the integration of "single" part files of existing standard parts will be described.

First of all you must validate if the standard you are about to integrate is already available in the **IFX** standard library or you will need a new standard.

#### 2.1.1 To Integrate single parts into existing IFX standards

To integrate single parts into existing **IFX** standards you first of all need to understand the structure of the **IFX** library. All standards are localized in the installation directory:

   • PARTS/SCREWS_AND_PINS/…

In the SCREWS_AND_PINS folder you will find various subfolders that contain the different types (screws, nuts, washers and pins). They are also grouped into mm and inch files.

In this case we want to add the following customer screw into the Library:

- Filename: ISO4762_M8X16_88.prt
- Standard: ISO 4762
- Diameter: 8
- Length: 16
- Pitch: 1.25
- Units: mm
- Counter bore: DIN974-1 R1
- Material: 8.8
- ID's: AXIS 498; SURFACE 465
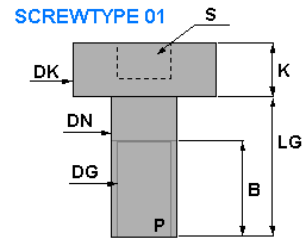
To integrate the Screw into the library follow the next steps:

1. Open the desired *.dat File → parts\screws_and_pins\screws\mm\ iso4762-8_8.dat
2. Add the required ID's in the header of the dat file.

```
 1   !-------------------------------------
 2   ! →DIN EN ISO 4762 - 8.8
 3   !
 4   ! →Hexagon socket head cap screws
 5   ! →Zylinderschrauben mit Innensechkant
 6   !-------------------------------------
 7
 8   SCREWTYPE →1
 9   UNIT →MM
10
11   SURFACE→28 →465
12   AXIS →71 →498
13   CBSCR →DIN974-1 R1
14   INFO →DIN EN ISO 4762 - 8.8
```

3. Locate the correct Size: M8x16

```
ISO4762-M8x12-8_8 →M8 →8 →12 →12 →6 →13 →8 →6.8 →1.25 →headcapscrew →ISO 4762 →M8 x 12 - 8.8
ISO4762-M8x14-8_8 →M8 →8 →14 →14 →6 →13 →8 →6.8 →1.25 →headcapscrew →ISO 4762 →M8 x 14 - 8.8
ISO4762-M8x16-8_8 →M8 →8 →16 →16 →6 →13 →8 →6.8 →1.25 →headcapscrew →ISO 4762 →M8 x 16 - 8.8
ISO4762-M8x18-8_8 →M8 →8 →18 →18 →6 →13 →8 →6.8 →1.25 →headcapscrew →ISO 4762 →M8 x 18 - 8.8
ISO4762-M8x20-8_8 →M8 →8 →20 →20 →6 →13 →8 →6.8 →1.25 →headcapscrew →ISO 4762 →M8 x 20 - 8.8
```

4. Now all you have to do in this case is to change the INSTANCE name (without extension) to the name of your: ISO_4762_M8X16_88.PRT

```
ISO4762-M8x12-8_8 →M8 →8 →12 →12 →6 →13 →8 →6.8 →1.25 →headcapscrew →ISO 4762 →M8 x 12 - 8.8
ISO4762-M8x14-8_8 →M8 →8 →14 →14 →6 →13 →8 →6.8 →1.25 →headcapscrew →ISO 4762 →M8 x 14 - 8.8
ISO4762_M8X16_88 →M8 →8 →16 →16 →6 →13 →8 →6.8 →1.25 →headcapscrew →ISO 4762 →M8 x 16 - 8.8
ISO4762-M8x18-8_8 →M8 →8 →18 →18 →6 →13 →8 →6.8 →1.25 →headcapscrew →ISO 4762 →M8 x 18 - 8.8
ISO4762-M8x20-8_8 →M8 →8 →20 →20 →6 →13 →8 →6.8 →1.25 →headcapscrew →ISO 4762 →M8 x 20 - 8.8
```

The screw is now integrated in the library and will be used by **IFX**. If you don't have a Database like PTC Windchill ensure that you have a search.pro that includes the path of the integrated screw.

Also you should check the parameters of the screw. **IFX** screws have preconfigured parameters that can also be modified. For more information about this check chapter 3.

2.1.2   To integrate single parts into IFX without existing standards

If the standard part you want to integrate does not exist you will have to do a more complex procedure than in 2.1.1.

To create a new standard there are templates of screws, nuts, washers and pins in the **IFX** installation path. They can be found in:
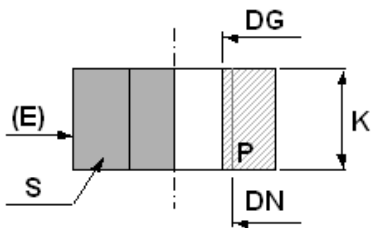
- CONFIGURATION\TYPES\...

In the TYPES folder you will find subfolders for screws, nuts, washers and pins. After choosing one folder (for the new standard) you will find certain types. E.g. screw_01. It is required to know which type is needed for your new standard.
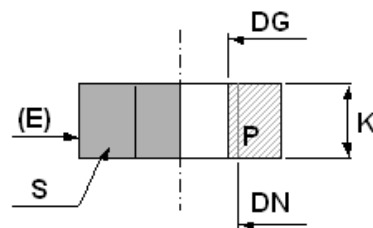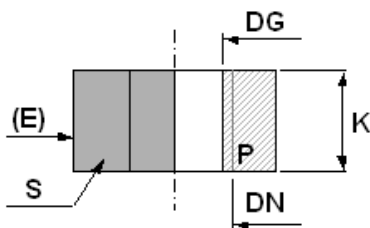
The following types are available:
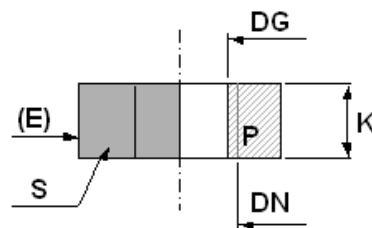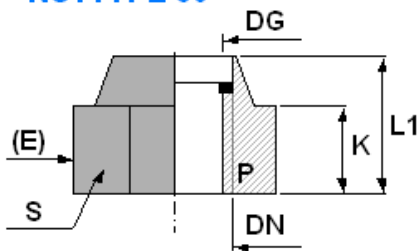
NUTS:

NUTTYPE 52

NUTTYPE 60

NUTTYPE 62

NUTTYPE 80

NUTTYPE 99

PINS:

PINTYPE 01

PINTYPE 02

SCREWS:

SCREWTYPE 01

S, DK, K, DN, LG, DG, B, P

SCREWTYPE 02

S, DK, K, DN, LG, DG, B, P

SCREWTYPE 03

S, L1, DK, K, DN, LG, DG, B, P

SCREWTYPE 20

S, (E), K, DN, LG, DG, B, P

SCREWTYPE 21

S, (E), K, DN, LG, DG, P

SCREWTYPE 40

S, (E), K, DN, LG, DG, B, P

SCREWTYPE 41

S, (E), K, DN, LG, DG, P

SCREWTYPE 60

S, DK, K, DN, LG, DG, B, P
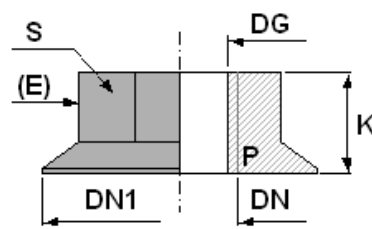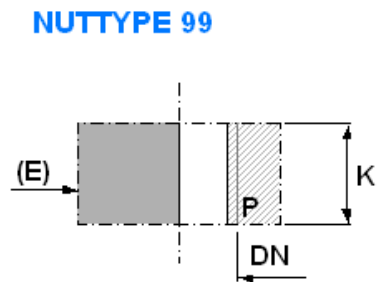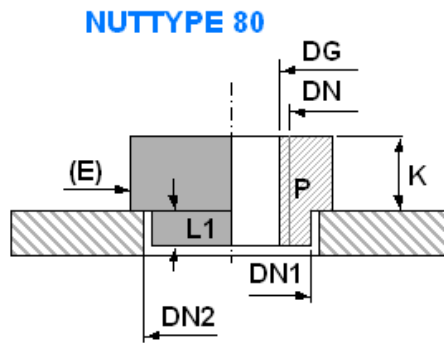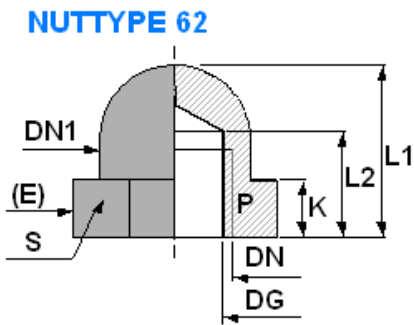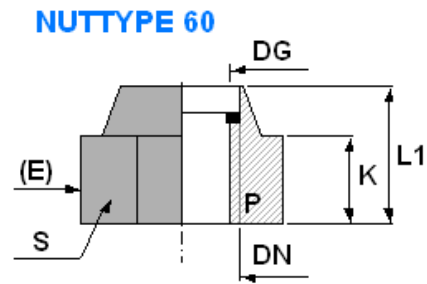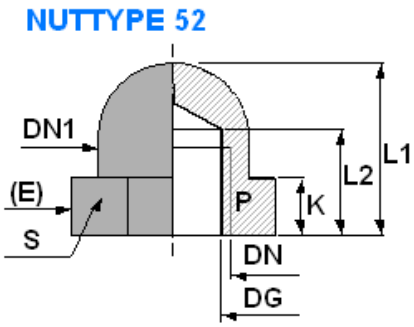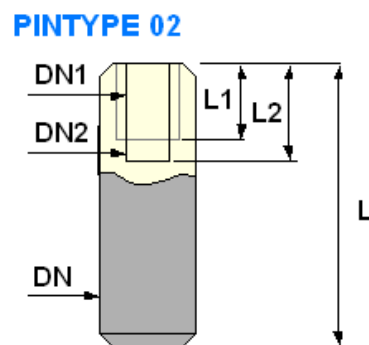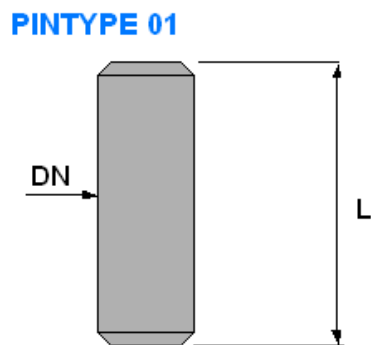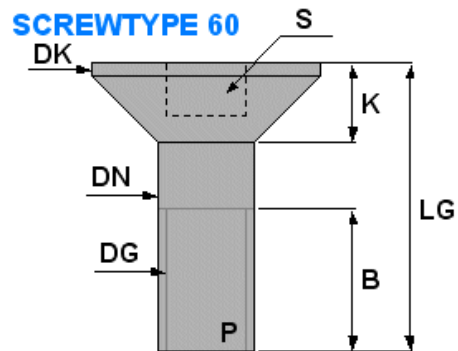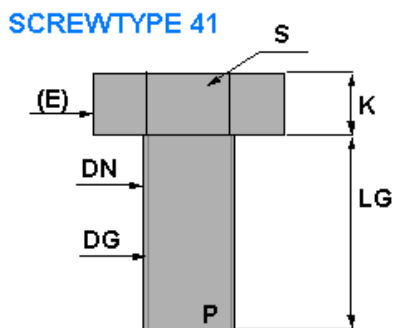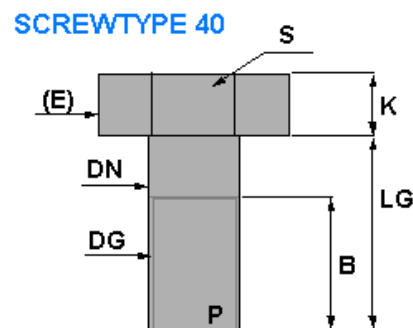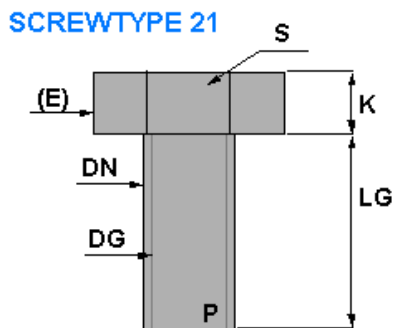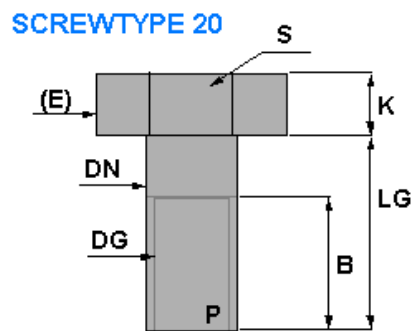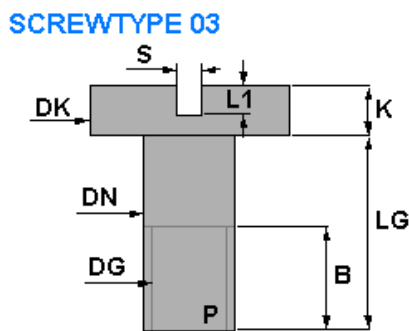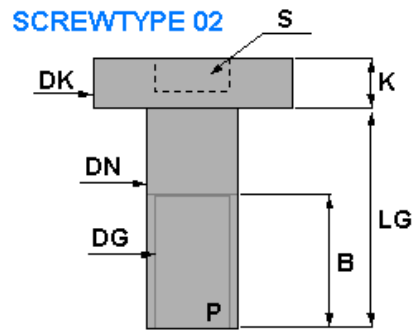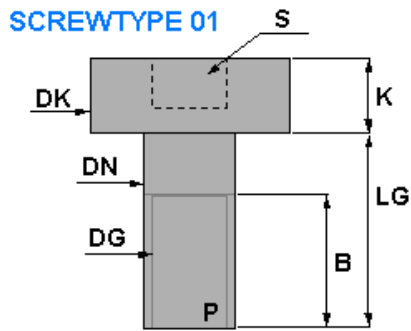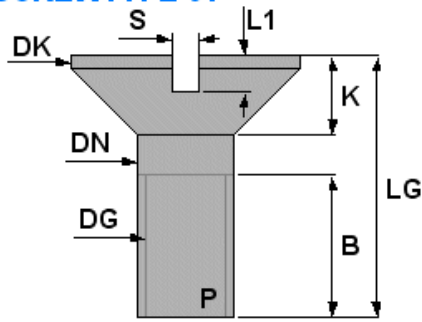
SCREWTYPE 61

SCREWTYPE 81
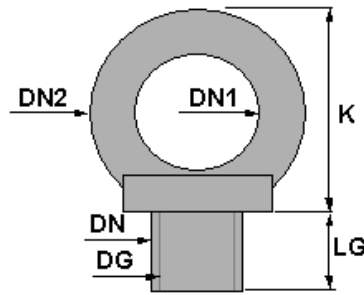
SCREWTYPE 82
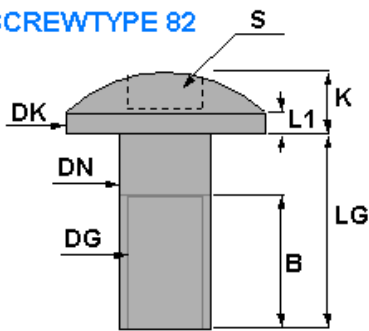
SCREWTYPE 99
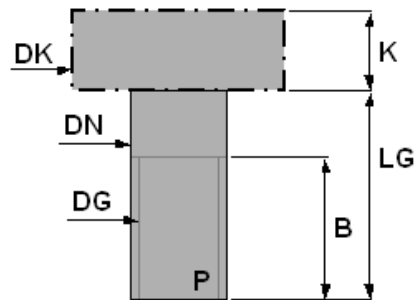
WASHERS:

WASHERTYPE 01
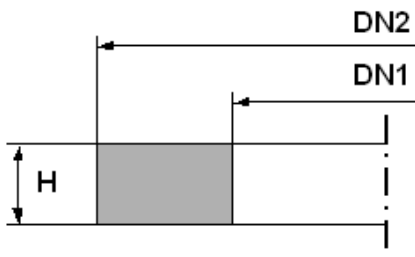
WASHERTYPE 02
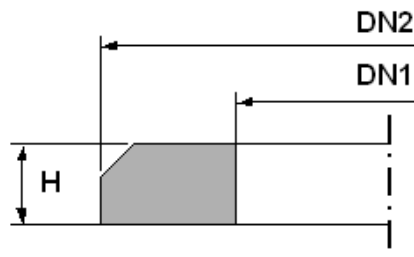
WASHERTYPE 03

WASHERTYPE 04
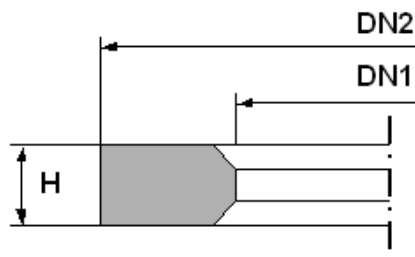
WASHERTYPE 20

WASHERTYPE 40
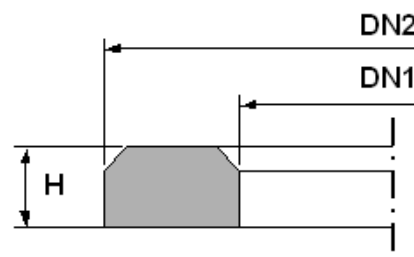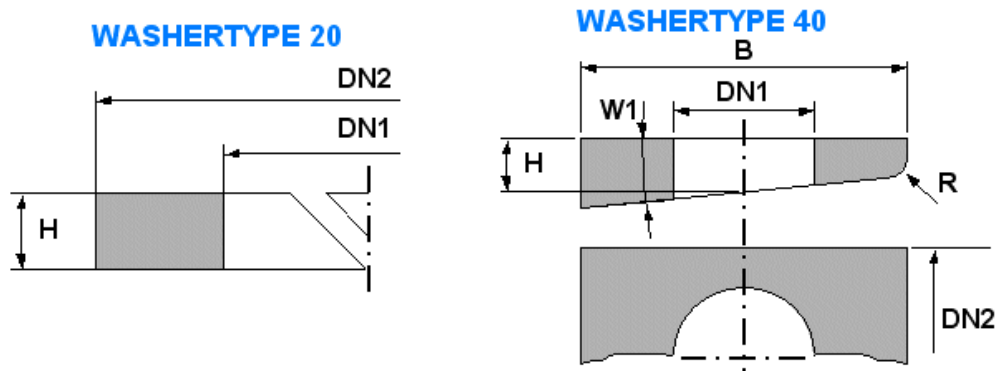
In this example we will create a DEMO standard with screw type 01. As we want to use that part as a company custom part we will put it in a new catalog. Proceed with the following steps:

1. Create a new folder for our catalog in: **parts\screws_and_pins\screws\custom**
2. Copy the files from the **configuration\types\screw\screw_01** into the custom folder
3. Rename the files to **my_std_001**. Keep the **_detail** and **_icon** after filename.

| my_std_001.dat | my_std_001.gif | my_std_001.prt | my_std_001_detail.gif | my_std_001_icon.gif |
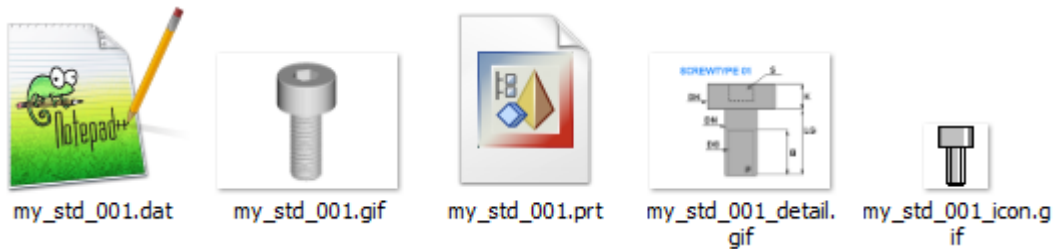
4. To make the customer folder available for **IFX** edit the **screws.mnu** file in **parts\screws_and_pins\screws** folder:

```
 1    SCREWS
 2    #
 3    #
 4    /mm
 5    Screws and Bolts
 6    Schrauben
 7    /inch
 8    Screws and Bolts
 9    Schrauben
10    /custom
11    Custom
12    Custom
```

5. Then switch to the custom folder and create a new custom.mnu file here.
6. Add this entries to the custom.mnu file:

```
 1    CUSTOM
 2    #
 3    #
 4    my_std_001.prt
 5    Custom standard 001
 6    Custom standard 001
```

The new standard is now ready to use, but has currently no instances.

The next steps will show the integration of instances:

- Open the my_std_001.dat file. You will see the following:

```
1   !-----------------------------------------------
2   ! →Zylinderschraube mit Innensechskant
3   ! →Hexagon socket head cap screw
4   !-----------------------------------------------
5
6   SCREWTYPE →1
7   UNIT ——→MM
8   SURFACE›28
9   AXIS ——→71
10  CBSCR——→DIN974-1 R1
11  INFO ——→<YOUR SCREW1>
12
13  SYMBOL · ·——→STRING →DN →LG →B ——→S ——→DK →K ——→DG →P
14  INSTANCE ——→STRING →DN →LG →B ——→S ——→DK →K ——→DG →P
```

- Edit *INFO* and change it to My Standard 001

We now want to add the instances. There are two types that can be added. One possibility is that the part we want to add does already exist. In this case you must analyze the part at first and gather the required information such as in 2.1.1. Remember to insert the ID's of surface and axis.

If you want to create a new part with *IFX* you must do a similar task, but the ID's should be already correct, because the template from the configuration folder has been used.

This is how the dat file should look like after integrating two parts:

```
1   !-----------------------------------------------
2   ! →Zylinderschraube mit Innensechskant
3   ! →Hexagon socket head cap screw
4   !-----------------------------------------------
5
6   SCREWTYPE →1
7   UNIT ——→MM
8   SURFACE›28
9   AXIS ——→71
10  CBSCR——→DIN974-1 R1
11  INFO ——→My Standard 001
12
13  SYMBOL · ·——→STRING →DN →LG →B ——→S ——→DK →K ——→DG →P
14  INSTANCE ——→STRING →DN →LG →B ——→S ——→DK →K ——→DG →P
15  MyStd001_M4x6 →M4 →4 →6 ——→6 ——→3 ——→7 ——→4 ——→3.3›0.7
16  MyStd001_M4x7 →M4 →4 →7 ——→7 ——→3 ——→7 ——→4 ——→3.3›0.7
```

You should now be able to select the new created screw type in the dialog:
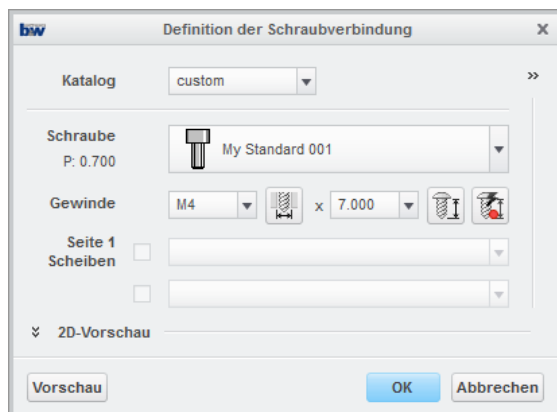
2.2 Integrate existing parts from Family tables

This section will show you how to integrate screws, nuts, washers and pins into the library of **IFX**.

2.2.1 Select type and copy into Library

First of all the correct type has to be determined. As explained in 2.1.2 select and copy the template you think is correct. In this example we will take a look at screwtype01.

Copy the files from the template folder into the library. In this example we will not rename the files. It is also necessary to edit the screws.mnu file in the folder to make the new screwtype available in the dialog.

Open the screw_01.gif

You can see all the required dimensions for this type of screw. In the next step we will transfer the dimensions into the screw_01.dat file. So open the file it should look like this:
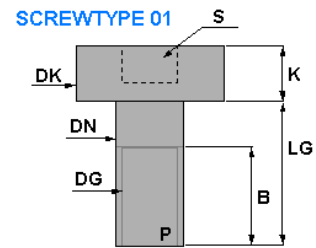
```
!------------------------------------------------------
!      Zylinderschraube mit Innensechskant
!      Hexagon socket head cap screw
!------------------------------------------------------

SCREWTYPE      1
UNIT           MM
SURFACE        28
AXIS           71
CBSCR          DIN974-1 R1
INFO           <YOUR SCREW1>

SYMBOL         STRING  DN     LG     B      S      DK     K      DG     P
INSTANCE       STRING  DN     LG     B      S      DK     K      DG     P
```

Now we have to collect the required dimensions and insert them into the dat-file.

2.2.2 Modify dat-file to work with family tables

In this subsection we will transfer the dimensions from the family table into the dat file and declare the name of the generic part.

The important part about copying the dimensions is that you have to take the Creo dimension names and not the renamed dimensions.

```
!-------------------------------------------------------
!      Zylinderschraube mit Innensechskant
!      Hexagon socket head cap screw
!-------------------------------------------------------


SCREWTYPE      1
UNIT           MM
SURFACE        28
AXIS           71
CBSCR          DIN974-1 R1
INFO           <YOUR SCREW1>


SYMBOL         STRING DN     LG     B      S      DK     K      DG     P
INSTANCE       STRING DN     LG     B      S      DK     K      DG     P
#FAMTAB        M<DN>  d5     d3     d4     d8     d12    d7     d6     pitch
```

The column STRING represents the name of the diameter in the selection dialog. It is a combination of the text "M" and the dimension of the DN column.

The next step is to declare the generic part of the table.

```
!-------------------------------------------------------
!      Zylinderschraube mit Innensechskant
!      Hexagon socket head cap screw
!-------------------------------------------------------


SCREWTYPE      1
UNIT           MM
SURFACE        28
AXIS           71
CBSCR          DIN974-1 R1
INFO           <YOUR SCREW1>


!Enter the name of the Family Table Part
!-----------------------------------
FAMPRT din912


SYMBOL         STRING DN     LG     B      S      DK     K      DG     P
INSTANCE       STRING DN     LG     B      S      DK     K      DG     P
#FAMTAB        M<DN>  d5     d3     d4     d8     d12    d7     d6     #
```

If you don't use a database like PTC Windchill make sure, that you have a search.pro that includes the defined generic part.

2.2.3 Filter actions in the family table

If you have a large family table you might want to filter and split the family table in multiple dat files. In this example we will exclude certain diameters and filter the table via **MATERIAL** and **NORM**.

```
!------------------------------------------------------
!       Zylinderschraube mit Innensechskant
!       Hexagon socket head cap screw
!------------------------------------------------------

SCREWTYPE       1
UNIT            MM
SURFACE         28
AXIS            71
CBSCR           DIN974-1 R1
INFO            <YOUR SCREW1>


!Enter the name of the Family Table Part
!-----------------------------------
FAMPRT din912

MUST    MATERIAL        8.8
MUST    NORM    DIN912

NOT     DIA     22.0
NOT     DIA     27.0

SYMBOL          STRING DN    LG    B     S     DK    K     DG    P
INSTANCE        STRING DN    LG    B     S     DK    K     DG    P
#FAMTAB         M<DN>  d5    d3    d4    d8    d12   d7    d6    pitch
```

In this example the table will be filtered by:

- **MATERIAL** must be 8.8
- **NORM** must be DIN912

The diameters **22** and **27** will be ignored and will not appear in the selection.

2.2.4 Info and Subinfo

With the entry *INFO* you can define the name that will be shown in the selection dialog box in *IFX*.

The *SUBINFO* gives you the possibility to define a column to make a selection box within *IFX*. It is therefore possible to use the same dimension and length of a screw with different parameters e.g. *MATERIAL*.

```
!--------------------------------------------------------
!      Zylinderschraube mit Innensechskant
!      Hexagon socket head cap screw
!--------------------------------------------------------

SCREWTYPE      1
UNIT           MM
SURFACE        28
AXIS           71
CBSCR          DIN974-1 R1
INFO           DIN912 8.8
SUBINFO        SPECIAL


!Enter the name of the Family Table Part
!-----------------------------------
FAMPRT din912

MUST    MATERIAL      8.8
MUST    NORM    DIN912

NOT     DIA     22.0
NOT     DIA     27.0

SYMBOL         STRING DN    LG    B     S     DK    K     DG    P
INSTANCE       STRING DN    LG    B     S     DK    K     DG    P
#FAMTAB        M<DN>  d5    d3    d4    d8    d12   d7    d6    pitch
```
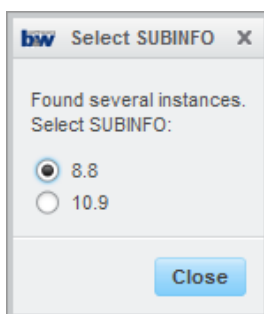
In this case a dialog will pop up if there are two parts with identical diameter and length but different value of the parameter *SPECIAL*.

This is an example of the dialog:

3 Customize Parts

In this chapter the customization of **IFX** parts will be described. It is possible to create parameters directly in the dat-file or you can add relations to new created parts.

3.1 Customizing with param_relations.txt

The easiest way to customize parts is via the **param_relations.txt.** With this file you can define relations to all new created **IFX** standard parts. There is a separate relations file in every **IFX** library subfolder (screws/mm; screws/inch; etc.).

Example:

```
NAMING = BUW_NAME

DESIGNATION = BUW_TYPE + " - " + BUW_SIZE
```

Now every new part will have a Parameter NAMING with the value of BUW_NAME and a Parameter DESIGNATION with the combined values of BUW_TYPE a " - " and the parameter BUW_SIZE.

It is also possible to do more complex relations. See Creo Help center for more information.

3.2 Customizing with dat-files

Besides the param_relations.txt there is also another way to customize parts by modifying the dat files. This is a more complex way of customizing parts, because you will have to edit all the dat-files.

Basic structure of a dat-file is:

```
!-------------------------------------------------------
!      Zylinderschraube mit Innensechskant
!      Hexagon socket head cap screw
!-------------------------------------------------------

SCREWTYPE       1
UNIT            MM
SURFACE         28
AXIS            71
CBSCR           DIN974-1 R1
INFO            ISO4762


SYMBOL          STRING DN    LG    B     S     DK    K     DG    P     TEST
INSTANCE        STRING DN    LG    B     S     DK    K     DG    P     TEST
ISO4762_8x20    M8     8     20    20    6     13    8     6.8   1.25  My Parameter
```

Block 1:

This block describes the basic information about the component. In the table you will find a list of all possible commands.

Name	Description
SCREWTYPE NUTTYPE WASHERTYPE PINTYPE	Enter the type of the standard part. See also 2.1.2.
UNIT	The unit of the standard part. MM or INCH
SURFACE	The feature ID of the reference surface used for assemble
AXIS	The feature ID of the reference axis used for assemble.
CBSCR	Insert the column name from the sl_data.cfg file, used for screws and washers (optional).
CBNUT	Insert the column name from the sl_data.cfg file, used for nuts and washers (optional).
INFO	Inset the value you want to show in the pull down for this standard part (optional).
SUBINFO	Allows a selection box if multiple instances with same diameter and length should be used (optional).

Block 2:

This block is used for columns with detailed parameter or dimension information of the components and can be compared to a family table. There are some specific columns that must exist to use a component.

The following entries are required:

Name	Description
SYMBOL INSTANCE	This column is used for the resulting Creo parametric filename.
STRING STRING	This column represents the Name in the option menu of the *IFX* dialog box

Besides these required entries - there can also be dimension names in the table. The names must exist in the template model you want to use. These dimensions are renamed.

If you add more columns to the dat file with specific parameters (in this case *TEST*), *IFX* will create a *STRING* parameter to the models with the given value.

Existing parameters will be modified by *IFX* if they are in the dat file. If you want to modify parameters with this technique make sure that the data type of the parameter fits with the value in the dat file. When creating and modifying parameters like this also remember to designate the parameters if this is required, because parameters that will be created by *IFX* can't be designated automatically.

Block 3:

This block represents the resulting instances. Make sure that all columns are tab delimited and the values fit the requirements of the column data type.

4 Impressum

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