



HOME

User Manual

DELMIA Process Engineer®

Project Library – Application



Foreword

This manual provides an introduction to the basic project library operations and functions.

While developing these functions we have made every effort to create a clearly organized, easy-to-understand program structure.

A user-friendly interface as well as a clear menu guide will enable you to quickly learn how to operate the program and to get familiar with its functions so that you can carry out your planning tasks in a quick and reliable way.

Nevertheless, there will certainly be some things that we could do even better. If you have any suggestions for improving our software, please be sure to let us know.

We look forward to receiving your constructive feedback. It helps us to make it even easier for you to work with the Process Engineer functions.

The same holds true for the manual that you are now reading. If, at any point when using these instructions, you feel you are not being provided with the clear, unambiguous, and proper guidance necessary to work with this application, please be sure to let us know. We look forward to receiving your comments and tips.

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1. Introduction

This manual explains how to use the Process Engineer project library for your planning purposes.

1.1 How to Use this Manual

This manual enables you to get familiar with the operation and functions of the project library. This manual briefly describes:

- The definitions relating to product, process and resource components as well as further planning details and general conditions
- How to use the different project library functions



Note

When handling the basic project library functions, please remember that there is a general introduction to the Process Engineer in the Basic Manual.



Click [General Introduction](#) to access the manual.

1.2 Documentation Conventions and Symbols

The symbols used in this manual are intended to provide you with keys to the contents in an immediately understandable manner.



This symbol is used to introduce key concepts that are covered in the sections immediately following this symbol. As a result, this symbol most frequently appears at the beginning of chapters or sections.



Note

*This symbol is used to mark notes, which provide you with additional information you need to have for further work. You will either find the Note sign at the beginning of a chapter or in a particular text passage in the chapter. Texts bearing this sign are additionally marked with **Note**. The text is always in italics.*







Caution

*This symbol indicates that the text that follows describes particular circumstances that you must avoid to avoid potential errors with the operation of the program or harm to data. You will either find the Caution sign at the beginning of a chapter or near a particular text passage in the chapter. Texts that are introduced by this sign are additionally marked with **Caution**. The text is always in italics.*

Example

This symbol marks examples which serve to illustrate a certain situation.

-  This symbol marks the individual operational steps involved in a particular operating instruction. Operating instructions describe operational steps, for example, how to open a menu or execute a function.
-  This symbol marks listed subjects. The symbol for listed subjects can be either used to structure a continuous text or to list main subject keywords.
-  This symbol marks list inside a bulleted or numbered list.
-  This symbol marks cross reference information that is available in another manual.

1.3 New Functions in Project Library

No new functionality has been added for this release.

2. Starting the Project Library

- 1) Create an new project or open an existing one.
- 2) Click **Project Library**.

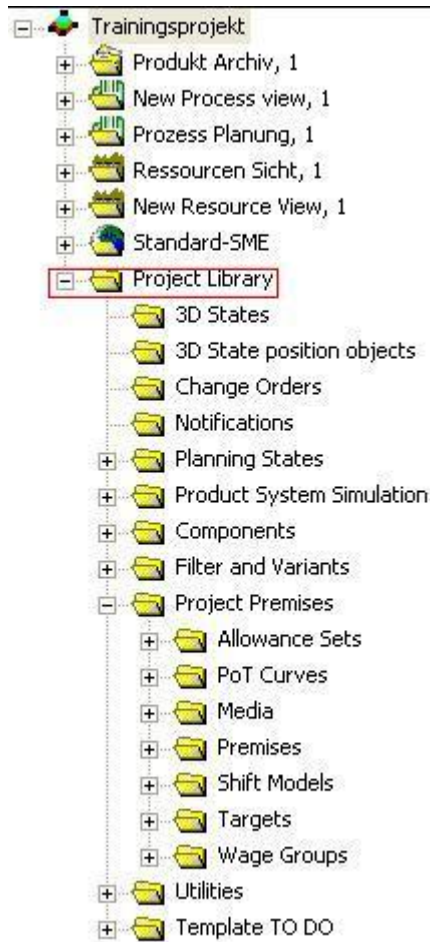


Figure 1: Opening Project Library

3. Allowance Sets

Allowances are certain amounts (percentage supplements), by which a process, product, resource object, or more generally, a time calculation, a price, or a salary is extended, if one does not want to take into consideration the percentages that are not directly calculable into the total..

Allowance sets are generally accounting keys of costs for a main cost center so that the costs can be set off against the products.

3.1 Creating Allowance Sets

- 1) Open the project in which you want to use the allowance sets.
- 2) Open the structure tree **allowance sets** in the project library.
- 3) Open one of the three directories: allowance set process, product, or resource and create a new **allowance set**.
 - Right-click on the object node allowance set process, product, or resource and select the option **New**.

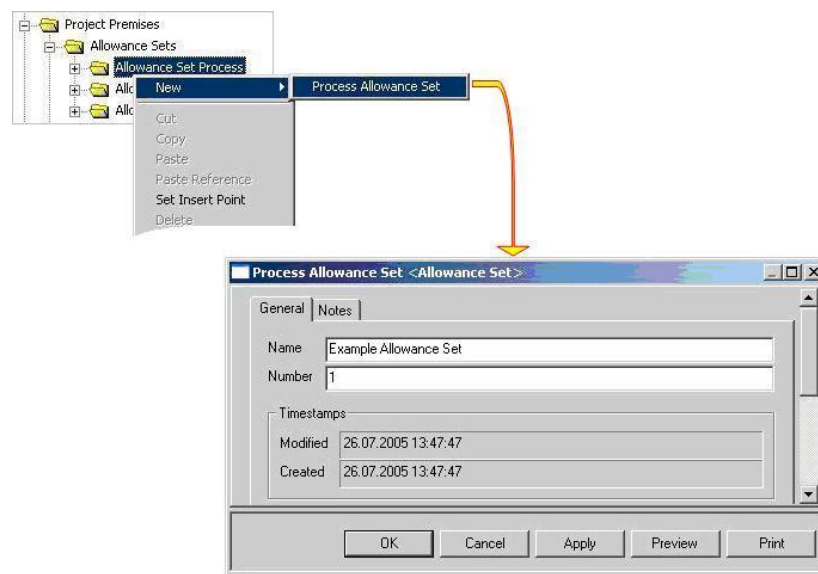


Figure 2: Structure Tree "Allowance Sets"

- 4) Enter the name and number into the corresponding text fields and confirm by left-clicking **OK**.

The created allowance set is shown in the structure tree.



Note

In order to be able to create sensible allowance sets, you must already be familiar with the data model of the DELMIA Process Engineer and you must have previously worked with the Configuration Manager.

3.1.1 Assigning Allowances

As long as you have not created any allowances in the project library, you can not assign any allowances.

Figure 3: Properties of a Process without Allowances in the Project Library

If you have created allowances in the project library, you can assign objects to these allowances. *Please refer to the [Figure 4](#).*

Figure 4: Properties of a Process with Allowances in the Project Library

- 1) Select the allowance and activate the checkbox **Calculate Allowances**. The allowance is then added to the defined attribute.



Note

*If the attribute for **allowance sets** and **calculated allowances** is not displayed, you must have the attribute **Allowance Set** (allowanceset) displayed in your plantype set or in your configuration for the allowance set and **Calculate Allowances** (calculateallowances) for **Calculate Allowances**. You can read how to show attributes in the [Administration Manual](#).*

The individual fields of a allowance set are explained in the next section.

Further aspects of the topic are expounded upon in an **example** of creating and using allowance sets.

3.2 Properties Dialog

The **Properties** dialog consists of an allowance from the categories description, condition, and calculation. *Please refer to the [Figure 5](#).*

The screenshot shows a software window titled "Process Allowance <Allowance>". It has two tabs: "General" and "Notes". The "General" tab is selected and contains several input fields organized into sections. The "Description" section includes fields for Number (0), Name (Allowance), Shortname, Unit, and Value (0,00). The "Condition" section has fields for "Depends on Attribute", "Dependency Operator" (a dropdown menu), and "Value of dependent attribute". The "Calculation" section includes fields for "Calculation Attribute 1", "Operator" (a dropdown menu), "Calculation Attribute 2", and "Attribute Allowance". Below these is a "Multiply Definable" checkbox which is unchecked. The "Timestamps" section shows "Modified" and "Created" dates as "26.07.2005 13:55:00". At the bottom of the window are five buttons: "OK", "Cancel", "Apply", "Preview", and "Print".

Figure 5: Properties of an Allowance Set

3.2.1 Input Fields

■ Description Fields

Table 1: Description Fields

Fields	Description
Number	Number of the allowance set. The number of the allowance set determines the sequence in which the individual sets are executed. It must be filled out if there are several consecutive allowances.
Name	Name of the allowance set. The name is for description purposes only.
Short name	Short name of the allowance set. The short name is for description purposes only.
Unit	Unit of the allowance set. Only for description.

■ Condition Fields

Fill out these input fields only if the allowance assignment is dependent on pre-defined values of an attribute.

Table 2: Condition Fields

Fields	Description
Depending on the attribute	The attribute name.
Dependency Operator	Operator with which the attribute is compared.

Fields	Description
Value of dependent attribute	The attribute name or a number.

■ Calculation Fields

Fill out these input fields if an allowance is to be created for a certain attribute. The calculation fields do not involve any prerequisite conditions.

Table 3: Calculation Fields

Fields	Description
Calculation Attribute	Enter the attribute name or number here.
Operator	Select the operator with which the attributes are to be linked.
Calculation Attribute 2	Enter the attribute name or number here.
Attribute Allowance	Enter the attribute name here.

■ Checkbox "Multiply Definable"

For time being the number of an allowance set can still be assigned more than once. **This option should NOT be used!**

3.2.2 Setting up an Allowance Set

General Information

1. Whenever you want to create an allowance, you must first know the attribute (internal name) to which this allowance is to be assigned or added.
2. First, edit the description fields.
3. If a condition is to apply to the allowance, define the condition in the section Conditions. Otherwise leave this section blank. Here you must also know the condition attribute and its internal name.
4. In the last step the actual allowance is defined in the calculation fields.
5. If several allowances are to be added to the same attribute, you must create multiple allowances. In this case the number in the description fields is important, since it determines the sequence in which the individual allowances are processed.

3.2.2.1 Condition

The condition has the following format:

if...then;

The **if** condition must be entered. The condition is a true/false expression.

- If the condition is fulfilled, **then** the command or command sequence is executed and the allowance is activated.
- If the condition is not fulfilled, **then** the command or command sequence is skipped and the allowance is not displayed.

Syntax

IF <depending on the attribute>

<operator>

<value of the dependent attribute>

THEN <execute calculation or do not execute calculation>

Comparison Operations

The following comparison operations are supported:

- =, <=, >=
- <, >, < >

Table 4: Examples of Comparisons

Depending on the attribute	Operator	Value of the Dependent Attribute
<Attribute name A >	<operator>	<Attribute name B >
<Attribute name A >	<operator>	<Number>
<Attribute name A >	<operator>	<String constant >

Prerequisites

- Attribute A and attribute B must be of the same type.
- String constants and numbers must be marked with **single quotation marks** ('STRING')

3.2.2.2 Calculation Fields

The calculation fields represent the following rules:

<Resulting attribute> = **<Attribute 1>** **<Operator>** **<Attribute 2>**

The rule looks like this in its short form:

<EA> = **<AT1>** **<Op>** **<AT2>**

Calculation Operators

The calculation fields support the following operations:

- +
- -
- *
- /
- %
- %+
- %-
- String

Whereby **%+** and **%-** execute the following calculation rules:

$$\begin{aligned} \text{EA} &= \text{AT1} + (\text{AT2} \times \text{AT1} / 100) & \text{thus } \text{AT1} + \text{AT2}\% \\ \text{EA} &= \text{AT1} - (\text{AT2} \times \text{AT1} / 100) & \text{AT1} - \text{AT2}\% \end{aligned}$$

3.2.2.3 Attributes

- **AT1** and **AT2** can either be a number or the name of an attribute.
- **EA** is always the name of an attribute.
- Numbers are marked with simple quotation marks ('number').

Example of Calculations

SUMMENEU = SUMME + 10

$$\text{SUMMENEU} = 100 - \text{SUMMEALT}$$
$$\text{SUMMENEU} = \text{SUMME} + \text{MWST}$$

3.3 Examples of Allowance Sets

3.3.1 General Information

You should consider the following questions before creating the allowances.

1. Which attributes are to be used?
2. Are they visible attributes?
3. Should the attributes be editable?
4. Are the attributes available or do they need to be created or overwritten?

Special attributes for the allowance calculation are available as of DPE version 5.15.

- m_dblallowancetemp_1 to 3
- m_dblallowancevalue_1 to 8
- m_dblallowancetime_1 to 8

New attributes were created in order to generalize the example. These attributes are visible on the interface, but they cannot be edited.

Shows the properties of a process. The allowances **personal distribution time**, **actual distribution time**, **allowanced TTU**, or the **processing time allowance** are often used in the time control. Setup time allowances (TR) are not taken into consideration in the example.

The sum of all times with allowances is the TE.

General	Time	Balancing	Simulation	Analysis Lines	Notes	Version Information
Estimated Time (TG)		0,0000 min				
Estimated Setup Time (TRG)		0,00 min				
Valid Time		estimated				
Calculated Analysed Times		0,0000 min				
MTM Analysis						
Time Analysis						
Manual Time (ttb)		0,0000 min				
Process Time (ttu)		0,0000 min				
Waiting Time (tw)		0,0000 min				
Set-Up Time (trg)		0,0000 min				
Calculated Time		0,0000 min				
Time Structure						
Valid TG		0,00 min				
Valid TRG		0,00 min				
Standard Time (te)		0,0000 min				
Set-Up Time (tr)		0,0000 min				

Figure 6: Properties of a Process, Tab Time

3.3.2 Objective, Initial Position

3.3.2.1 Definition of Terms

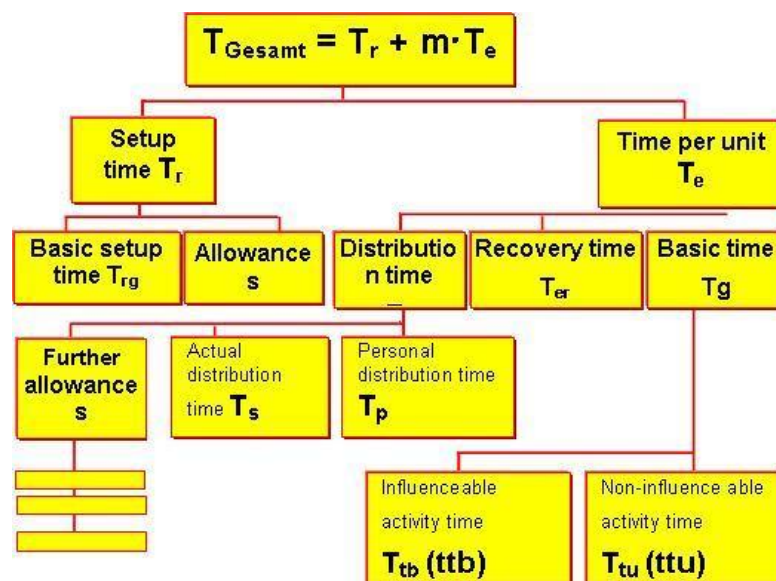


Figure 7: Time Structure for Default Times (T_{Gesamt})

What is done here?

- All allowances are added on a 100% basis – this is expressed by the operator '+'
- Personal distribution time and Actual distribution time** are added to the TG, i.e. the same percentages TTB and TTU (for an allowances of 5% to the TG, the allowance consists of 5% of TTB and 5% of TTU).
- Further allowances are not possible. Example: recovery time allowance, main time allowances, allowance to MTM times, and setup time allowance.

Required Attributes

Table 5: Required Attributes

Attribute	Prompt	Name (Internal)
Calculated time	Calculated Time	calctime
Calculated time (TG)	Calculated Time (TG)	calctime_tg
Calculated time (TRG)	Calculated Time (TRG)	calctime_trg
Calculated time (TTB)	Calculated Time (TTB)	calctime_ttb
Calculated time (TTU)	Calculated Time (TTU)	calctime_ttu

3.3.2.2 Preliminary Work Defining and Displaying Attributes

Table 6: Attributed Required for Calculation

Attribute	Prompt	Name (internal) only used in the example
Personal distribution time	Calculated Time	dbl_attribute_2
Actual distribution time	Calculated Time (tg)	dbl_attribute_3
Processing time allowance	Calculated Time (trg)	dbl_attribute_4
Intermediate result	Calculated Time (ttb)	dbl_attribute_5
Intermediate result	Calculated Time (ttu)	dbl_attribute_6
Subtotal		dbl_attribute_7

3.3.2.3 Target Result in DPE5

Correct filling in of the identified attributes, i.e. both the allowance time percentages and the TRG as a total value

TG **0.1800 min** (= TRG 0.1800 min)

TTB = 0.06

TTU = 0.12

Table 7: Personal Distribution Time

Time Allow- ances for	Op	Value	Calculation	Result
Basis TTB	+	5%	$0.06 / 100 * 5$	0,003
Basis TTU	+	5%	$0.12 / 100 * 5$	0,006
Personal time percentages				0,0090 min

Table 8: Actual Distribution Time

Time Allow- ances for	Op	Value	Calculation	Result
Basis TTB	+	11%	$0.06 / 100 * 11$	0,0066
Basis TTU	+	11%	$0.12 / 100 * 11$	0,0132
Actual time allowance				0,01980 min

Table 9: Allowance PTU

Time Allow- ances for	Op	Value	Calculation	Result
Basis TTU	+	8%	$0.12 / 100 * 8$	0,0096

Time Allowances for	Op	Value	Calculation	Result
Time percentage allowance PTU				0,0096 min

Result TE = 0.0090 + 0.01980 + 0.0096 + 0.1800 = **0.2184 min**

Result TR corresponds to the TRG, since no TR allowances are defined: 0.1800 min. Calculate sum in a time analysis.

Now the following allowances are created:

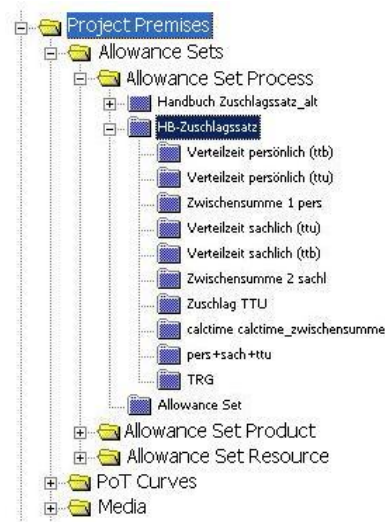


Figure 8: Allowances

These are:

1

Calculation

Calculation Attribute 1

caltime_ttb

Operator

*

Calculation Attribute 2

'0.05'

Attribute Allowance

dbl_attribute_5

2

Calculation

Calculation Attribute 1

caltime_ttu

Operator

*

Calculation Attribute 2

'0.05'

Attribute Allowance

dbl_attribute_6

3

Calculation

Calculation Attribute 1

dbl_attribute_5

Operator

+

Calculation Attribute 2

dbl_attribute_6

Attribute Allowance

dbl_attribute_2

Figure 9: Creating Allowances

4. Premises

Premises are default values and restrictions that apply to the planning process.

Information such as defaults relating to time or restrictions relating to location must be provided to keep the planning process transparent for specifying, displaying, and evaluating data.

The premises are created in the project library in the PPR Navigator. In addition to location premises, specific premises such as PoT curves or wage groups are needed for a project for planning purposes.



In this chapter you learn about the Properties dialog for entering location premises, creating shift models, and how media are determined, such as electricity and water, which are essential for operating machinery or assembly stations.

You can also learn:

- How to determine technical planned numbers (PoT curves). Technical planned numbers are used to determine the quantities of products.
- How you can define wage groups.



To edit the individual input fields in the dialogs, most of the input fields have a right mouse click function to get to context functions, with which you can determine the respective parameters for the input field.

Overview of Premises Discussed in this Chapter:

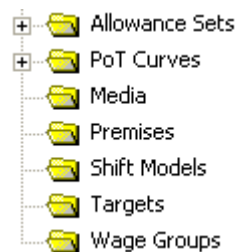


Figure 10: Overview of the Different Types of Premises

4.1 Creating Location Premises

In order to supply steam to the steam locomotive, the stoker has to shovel coal into the oven. This is a premise for the mobile location of a train, to always keep enough coal on hand in the tender. If you transfer this same logic to a modern production location, for example, you can see that planning and operation cannot be properly carried out if only one element is known. The data relevant for location is specified in this Premises Properties dialog, .

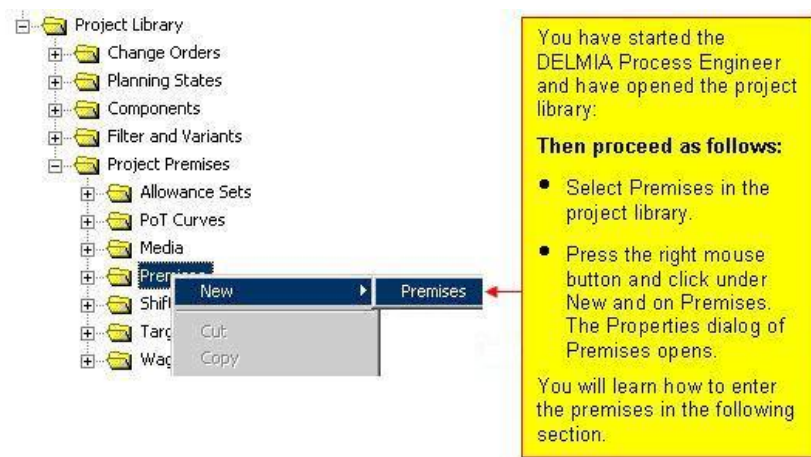


Figure 11: Creating Premises - Location

4.1.1 Editing Premises



Location premises are generated in the project library under the Premises node.

Several location premises can be defined for a project. Context functions are available for editing the input fields.

Figure 12: Entering Premises - Location

4.1.2 Editing Input Fields

4.1.2.1 Specifying Room Dimensions

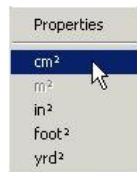
By entering the information for **room dimensions**, you are describing the building facilities planned for the project. Most of the data is simply for information purposes and is not used again for editing a project. An exception to this rule is the data for the Area Costs Multiplier.

- 1) To open a context menu, left click in the respective input field and then press the right mouse button.

Editing Fields – using the Context Functions

You will find various functions in the context menu for the input fields under **Room dimensions**.

With the exception of the **Area Costs Multiplier** field, you can change the unit of measure for all of the other input fields using the context menu.



Selecting the Area Costs Multiplier

The Area Costs Multiplier refers to the multiplier used to multiply the space for a machine to determine additional space needed. The Area Costs Multiplier must be determined at the beginning of the project. It can also be changed at a later time. It subsequently affects every determination of space.

- 2) You can change the unit of measurement by opening the context menu and selecting a new unit of measurement from the context menu.

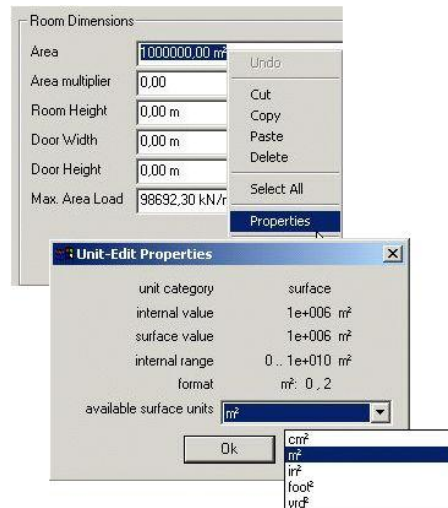


Figure 13: Editing Premises – Context Menu – Right Mouse Button



Note

You can see from the text which function of the right mouse button is active. A deactivated function always has a grey background. When a function is activated, the text is always black.



Figure 14: Example of a Context Menu for Room Dimensions

Undo

With this menu item: you can correct an entry that has just been made. You can only use this function during input. To make or change an entry, click input field, write the new text or change the current text and then press the right mouse button. A dialog box opens. Click **Undo**. The previous state appears again in the input field.

Cutting

Use this menu item to cut a block of text from an input field. You can insert the text right back in again. The text remains [on the clipboard] until a new block of text is copied or cut. Proceed as follows: Click input field, mark the text and paste it back in or leave it on the clipboard. Press the right mouse button each time for the individual functions.

Pasting

Use this menu item to paste the copied or cut text back in. To do this you need to press the right mouse button three times in a row, in the specific order: highlight, cut, copy, or paste.

Deleting

Use this menu item to delete a block of text in the input field. The text must first be highlighted.

Highlighting everything

Use this menu item to highlight the entire block of text in the input field. The entire text in that line is highlighted, even the text that you cannot see.

Properties

Use this menu item to specify the properties of an input field. The input fields have corresponding properties dialogs. Proceed as follows: Click input field, press the right mouse button and then click Properties. The Properties dialog opens for editing.

4.1.2.2 Determining the Costs per Year

The entries for **Costs per Year** pertain to the budgeted costs for the project area costs, area side costs and wage side costs. The costs entered in these fields are available in the project for further editing: to be able to perform specific evaluations You can use the context functions to edit the fields.

By default, the three fields of area costs, area side, costs and wage side costs are configured in the Process Engineer. All other fields are configured at the customer's location according to the application and can then be used for the project work.

Costs per year	
Area Costs	0.00 €/m²
Area Side Costs	0.00 €/m²
Area multiplier	1.50
Wage Side Costs	0.00 %
Average fee increase	0.00 %
Fee increase begin	<input checked="" type="checkbox"/> 3/28/2008

Figure 15: Determining Costs per Year for the Project

4.1.2.3 Specifying Medium Feed

You can specify information about the media in these fields. The information is used for information purposes only. You can use the context functions to edit the fields.

Medium feed	
Voltage (two-phase)	220.00 V
Deviation +/-	5.00 %
Voltage (three-phase)	220.00 V
Deviation +/-	5.00 %
Voltage Frequency	50.00 Hz
Deviation +/-	5.00 %
Compressed air	118.43 bar
Deviation +/-	5.00 %

Figure 16: Entering Medium Feed

4.1.2.4 Specifying Environmental Conditions

You can specify information about the environmental conditions in these fields. The information is used for information purposes only. You can use the context functions to edit the fields. *Please refer to the [Editing Input Fields](#).*

Environment	
Min. Temperature	25,00 °C
Max. Temperature	30,00 °C
Min. Air Condition	25,00 °C
Max. Air Condition	30,00 °C
Min. Air Humidity	80,00 %
Max. Air Humidity	90,00 %

Figure 17: Entering Environmental Conditions

5. PoT Curves

PoT curves play an essential role in the planning of a project. The PoT curves constitute a simple method for determining quantities and time periods, which can then be linked to products or processes.

PoT is the abbreviation for a technical planned number. A technical planned number describes the production time periods and the associated quantities, as well as the availability of people and machinery.

There are three types of PoT curves:

- Base curve
- Derived curve
- Sum curve

Two dialogs are available for editing all three curves: Properties dialog and the Extended Properties dialog.



In this chapter you become familiar with all of the functions required for editing all three PoT curves.

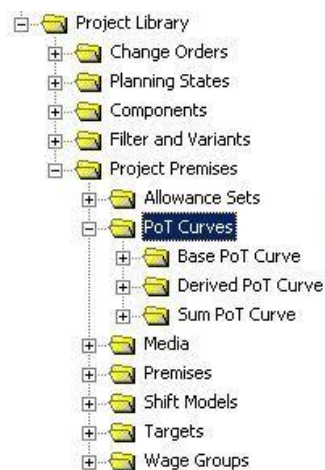


Figure 18: Overview of the Three PoT Curves

5.1.1 Creating the PoT Curves

The basic approach for creating one of the three PoT curves is the same as for all three types. Only the editing of the three curves differs, which is performed for the extended properties.



You become familiar with the extended properties when describing the three curves. *Please refer to the [Editing the Base PoT Curve](#), [Creating Derived PoT Curves](#), [Generating a Sum Curve](#).*

Example

To Generate a New PoT Curve

- 1) Select one of the three curves (base, derived, or sum PoT curve) from the project library. *Please refer to the [Figure 18](#).*



Figure 19: Generating a PoT Curve – Base Curve

- 2) Click respective curve under **New** (base curve in the example). *Please refer to the [Figure 19](#).*
- 3) Enter the specific PoT curve data in the Properties dialog.
- 4) Confirm the entries with **OK**. A corresponding PoT curve is generated. The same Properties dialog is available for all three curves. You can open the dialog for editing at any time via the **Context menu < Properties**.

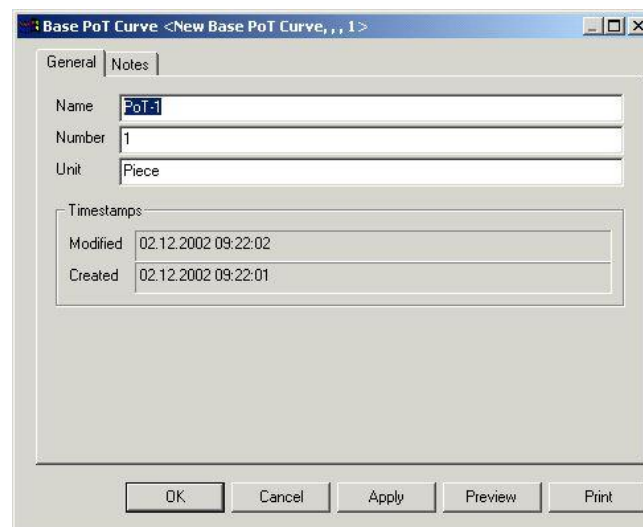


Figure 20: Properties Dialog for PoT Curves

5.1.1.1 Opening Extended Properties Dialog

Open the **Extended Properties** dialog using the context menu with the right mouse button. The process of opening is the same for all three PoT curves.

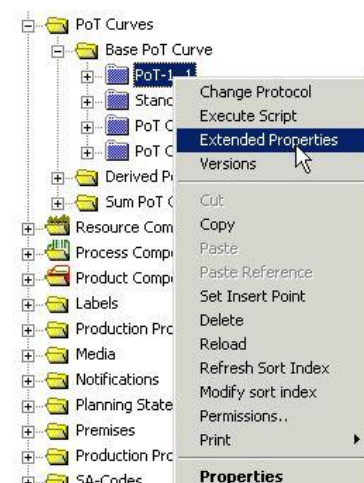


Figure 21: Calling Extended Properties via the Context Menu

- 1) Select one of the three generated PoT curves in the project library. Now press the right mouse button to open the context menu.
- 2) Click **Extended Properties**, the respective dialog for the extended properties opens. *Please refer to the [Figure 21](#).*

5.1.2 Editing the Base PoT Curve

The base PoT curve, as the name itself suggests, is the basis for the other two PoT curves.

- 1) To edit the base PoT curve, open the Extended properties for the generated base curve (*Please refer to the [Figure 21](#).*) via the context menu. *Please refer to the [Figure 22](#).*

	Begin Date	PoT
1	Export as XLS	100
2	02.12.2002	100
3	02.06.2003	100
4	02.12.2003	100
5	02.06.2004	100
6	02.12.2004	100

Figure 22: Dialog for Extended Properties – Base PoT Curve

The editing lines can be created directly in the dialog or via the interval method. The two fields **Begin date** and **PoT** are configured as default in the Process Engineer.

Start Date

The date can only be entered in a specific, fixed format and must be complete: Date format: **TT.MM.YYYY**.

PoT

You can only enter numbers in the PoT field. Specify the height of the technical planned number in this field.

Example

Two examples of meaningful fields that can be freely configured.

Employee Availability

This field can be freely configured and depends on the application at the customer's site. Specify in this field the percentage of time that employees are available. This percentage is determined according to operational criteria.

Availability of Technology

This field can be freely configured and depends on the application at the customer's site. Specify in this field the percentage of time that machinery is available. This percentage is determined according to operational criteria.

5.1.2.1 Editing Fields of Base PoT Curve

Generating Editing Line



- 1) To generate an editing line, click **New** in the dialog. You can generate as many editing lines as you wish.
 - All cells of the respective line can be edited. You can specify as many time periods as you wish for the individual curves.

	Begin Date	PoT
1	02.12.2002	100

	Begin Date	PoT
1	03.12.2002	200
2	04.12.2002	100

	Begin Date	PoT
1		
2		

Export as XLS
Export as CSV
Print whole Grid

Day
Year
Halfyear
Quarter
Month
Week
Day



	Begin Date	PoT	Year
1	04.10.2001	1200	

Usage

5.1.2.2

Periods

- If you generate a line via **New**, the current date is set the first time and for each additional line the next day's date is used. The interval method is quicker, where you have a choice of four cycles for generating the PoT curves.

Editing a Line

To edit a cell, click with the mouse button on the cell.

Selecting a Line

- 3) To select a line, click in the left column. You select a line in order to delete it.

Context Menu

- 4) To keep the context menu with both export functions, click in the upper left cell. Then press the right mouse button to open the context menu.

Selection List

- 5) Use the selection list to determine the time period for which the technical planned number (PoT) is planned.

Note

When entering the technical planned number, please note which time period was selected in the selection list. The size of a technical planned number is always specified for a particular time period and is only valid for this time period.

Sample Entry

Imagine: You have specified a time period of 1 year by entering the technical planned number, to the amount of 1200. You can always have the planned number for another time period displayed via the selection list. For example, for 1 week, the result is 23, so that the planned number 1200 is reduced down to 1 week.

The respective planned number for all of the time periods of the selection list can be displayed in this way. The size of the planned number entered at 1200 remains unchanged.

Displaying Usage

Usage of a PoT curve is displayed via the Usage button.

Using the Interval Method

Using the interval method you can easily create editing lines for the technical planned numbers (PoT curves).

Four intervals are available:

- Year
- Halfyear
- Quarter
- Month

All four intervals can be used to create editing lines.

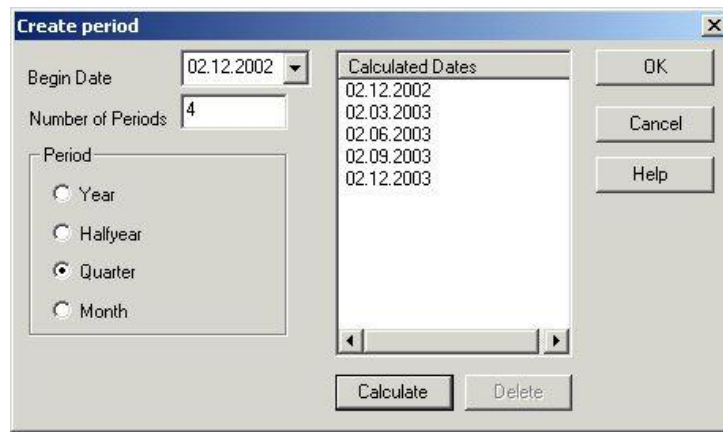


Figure 23: Dialog - Editing Intervals

Information must be entered in all fields to create intervals.

- 1) Click **Periods** in the **Extended Properties** dialog. The dialog for creating periods opens. *Please refer to the [Figure 23](#).*

Determining Start Date

A calendar is available for determining the start date on which the interval is to begin.



Figure 24: Calendar for Start Date – with Selection of Month

- 2) Determine the start date. The date can also be entered directly. The calendar appears when you click on the scroll bar arrow for the **begin date**.

Determining the Number of Intervals and Time Period

By setting the number of intervals, you can determine how many intervals should be created, and the number of editing lines to be created as well. The intervals are created according to the selected time period.

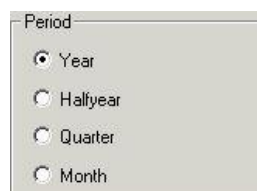


Figure 25: Number of Intervals – Determining Time Period

In order to provide information for the interval, type in the respective number for quantity and select the time period under Interval.

Calculate

Calculating Intervals

- 4) After all of the required information for intervals has been provided, click **Calculate**. The result is displayed according to the information provided. *Please refer to the [Figure 23](#).*

- 5) Click **OK** to confirm the entries. The new editing lines are displayed in the dialog and are ready to be edited. *Please refer to the Figure 26.*

	Begin Date	PoT
1	04.10.2001	100000
2	05.10.2002	100000
3	02.12.2002	100000
4	02.03.2003	100000
5	02.06.2003	100000
6	02.09.2003	100000
7	02.12.2003	100000

Figure 26: Dialog with New Editing Lines – Interval Method

5.1.3 Creating Derived PoT Curves

A derived curve is always based on a base curve. In a production unit specific variants can often be added to the basic model. Use **Multiplier** field to determine the number of variants. *Please refer to the Figure 28.*

Example

- When assembling an automobile for example, sometimes four wheels are used for a certain model and in another case five wheels.
- The basic work sequences could be considered the basis for the derived curve.
- In order to define the derived curve, you must always enter a multiplier for determining the number of variants; staying with the same example, you would input **Multiplier 4** for the four wheels and **Multiplier 5** for five wheels. The quantities of the PoT curve are increased according to the multiplier entered.
- Select the base curve of a newly derived PoT curve in the extended properties dialog of the derived PoT curve. Only one base curve may be selected for a derived PoT curve. *Please refer to the Figure 28 and Figure 21.*

To Edit PoT Curve

Edit

- 1) To specify a base curve, click **Edit** in the **Extended Properties** dialog. *Please refer to the Figure 27.*

	Begin Date	PoT
1	04.10.2001	400000
2	05.10.2002	400000
3	02.12.2002	400000
4	02.03.2003	400000
5	02.06.2003	400000
6	02.09.2003	400000
7	03.12.2003	400000

Figure 27: Extended Properties Dialog with the "Edit" Button

- 2) Select the base curve (only one base curve may be selected) in the **Edit PoT curve** dialog and enter a respective multiplier. Click **OK** to confirm your entry.
- 3) You always have to fill in the **Multiplier** field. If you do not fill in the Multiplier field, a message appears and you cannot finish the procedure. If no variants are planned, **Multiplier 1** must be entered. *Please refer to the Figure 28.*

Figure 28: Editing PoT Curve Dialog

5.1.4 Generating a Sum Curve

Edit

To generate a sum curve, at least two PoT curves must be selected. A sum curve can be formed from base PoT curves and derived curves.

The **Edit PoT curve** dialog is opened using the **Edit** menu item in the extended properties dialog of a sum curve. *Please refer to the Figure 21, Figure 27, and Figure 29.*



Note

It is not possible to create one sum curve from several sum curves.

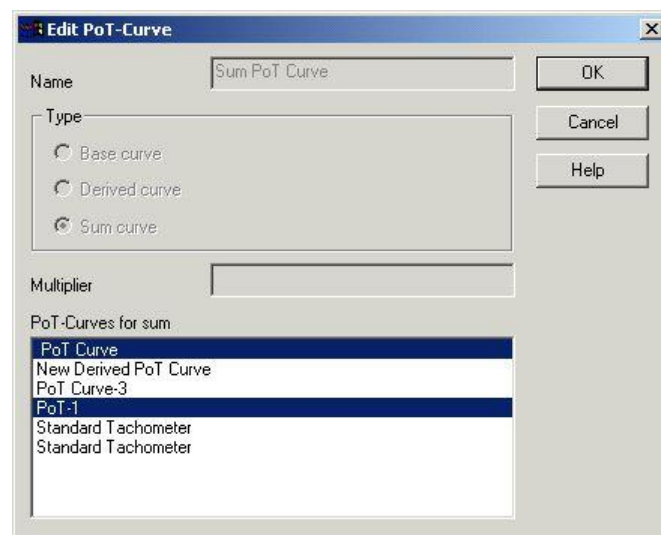


Figure 29: Editing a PoT Curve Dialog for Sum Curve

- 1) Select curves in the dialog; you can select any number of curves you like.
- 2) Press **OK** to confirm the selection. The sum curves are displayed in the **Extended Properties** dialog and can be edited.

6. Shift Model

6.1.1 Creating the Shift Model

For the workplace of today, a flexible approach must be taken to regulate work hours.

- Machines should be used wherever possible.
- For employees individual work time models are presented to choose from, so that having different types of shift models is advantageous.

You can create as many shift models as you like under the menu item **Create shift model**. The time periods can be defined individually and set up according to operational requirements.

Two properties dialogs are available for designing a shift model:

- **Properties** dialog in which the shift model is defined and the start date are specified. *Please refer to the [Figure 31](#).*
- The **Extended Properties** dialog, where the shift model is edited. *Please refer to the [Figure 33](#).*

- 1) To create a new shift model, click **Shift model** in the project library. In the **Properties** dialog, enter information for the shift model.

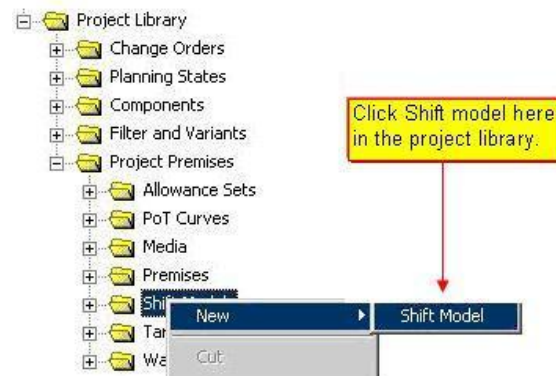


Figure 30: Start the Shift Model from the Project Library

6.1.2 Editing the Shift Model – Properties Dialog

- 2) Name the shift model in the **Properties** dialog; the designation should make reference to the type of shift model and the area where it is used.
- 3) Select the **Begin Date** via calendar. The date can also be entered directly.

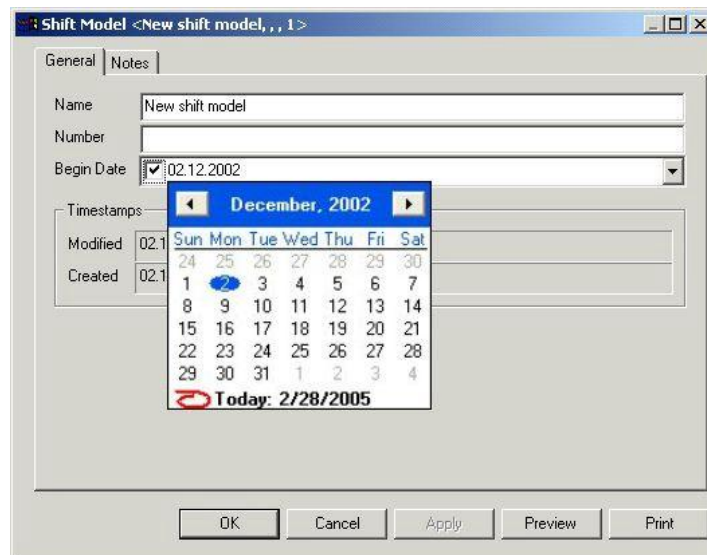


Figure 31: Enter Base Data for the Shift Model

- 3) Click **OK**. The new shift model is created. The **Properties** dialog can be edited. Open the **Properties** dialog via the context menu with the right mouse button for the created shift model in the project library.

6.1.3 Editing the Shift Model – Extended Properties

New

Select



The shift models are created and edited in the **Extended Properties** dialog. The editing lines for a shift model can be generated in two different ways:

- Generate a new editing line each time by selecting **New**.
- Select a shift model that has already been created using the **Select** button. Please refer to the [Figure 33](#).

Note

When creating the shift model, always make sure that the possible work times are not exceeded. If you do exceed a work time, a specific message informs you of this.

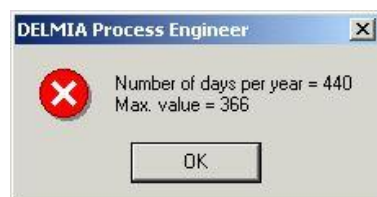


Figure 32: Example of a Message Indicating that a Work Time has been Exceeded

6.1.4 Editing Fields in the Dialog

- 1) Open the **Extended Properties** dialog via the context menu with the right mouse button for the created shift model.

	WD/Year	Shift 1 [min/Shift]	Shift 2 [min/Shift]	Shift 3 [min/Shift]	PoT-relevant
1	220	480	480	480	Yes
2	220	480	480	480	No

New Delete Select

Total Working Minutes: 538560 min

Productive working time per worker and year: 92400 min, 17,16 %

Description: Here a description to the shift model

OK Cancel

Figure 33: Direct Entry of Shift Data using New

- 2) An editing line generated using **Select** or **New** can now be edited. Specify the shift time in days in the fields of the editing line.
To edit a field, click it with the mouse.

PoT-relevant
Yes
No

Delete

- 3) Using the Selection list (**PoT-relevant**), determine whether a PoT curve is relevant for the shift model.
- 4) Select an editing line in the left column to delete the line.

	Shift 1 [min/Shift]	Shift 2 [min/Shift]	Shift 3 [min/Shift]	PoT-relevant
1	480	480	480	Yes

Figure 34: Select the Editing Line in the Left Column

- 5) To get the context menu with both export functions, click in the upper left cell. Then press the right mouse button to open the context menu.

AT/Shift/Shift 1

1

Export as XLS
Export as CSV
Print whole Grid

Total Work Minutes

This menu function is not an input field. The work minutes are automatically calculated from the program. They result from multiplying the workdays by the total shift times. The display always applies to just one shift model.

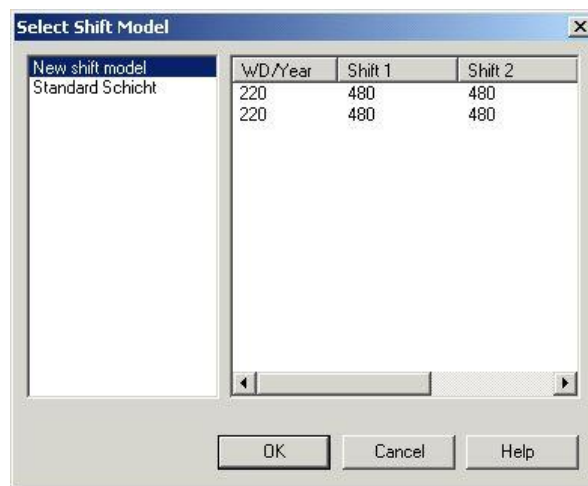
Productive Working Time Per Worker and Year

This menu function (productive minutes (min/employee year)) is an input field. Specify in this field which productive minutes are available for an employee in 1 year. The employee's breaks can also be taken into account here, as opposed to just the run times of the machinery. You can write the entries directly in the field or enter a percentage and the respective value is written in this field. The context menu of the right mouse button is available for making changes to the time unit or the percentage display.

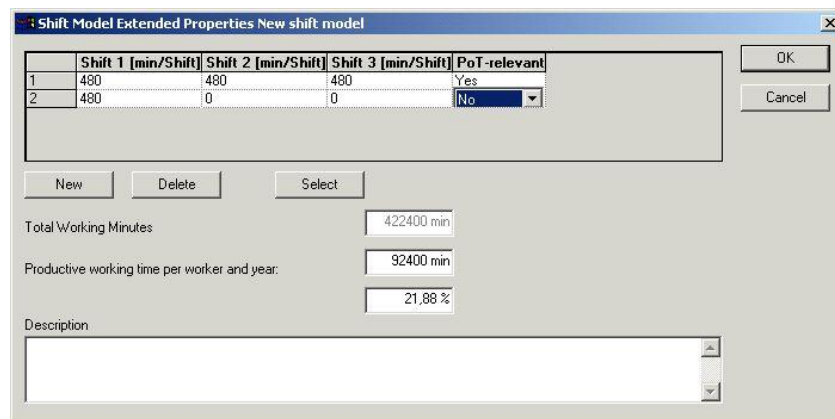
The selection function

Select

- 6) Click **Select**. A selection with the created shift models opens. Select the shift model you want to add and click **OK**. The values are applied.

**Figure 35: Select Shift Model**

7) The selected shift model is displayed in the dialog and can be edited.

**Figure 36: New Generated Shift**

7. Wage Groups

7.1 Determining Wage Groups

Determine the individual wage groups in the **Properties** dialog. You must redefine the properties each time for each wage group. For **Minute factor**, specify the multiplier for costs of an employee per minute.

- 1) Create a new wage group in the project library under **Wage Group**. You can get to the Properties dialog of the wage group for editing by double clicking or by using the context menu of the right mouse button.
- 2) Click the right mouse button to get to the context menus for the input fields, for example, to specify the currency for the input field **Wage Costs**.



Figure 37: Create a New Wage Group

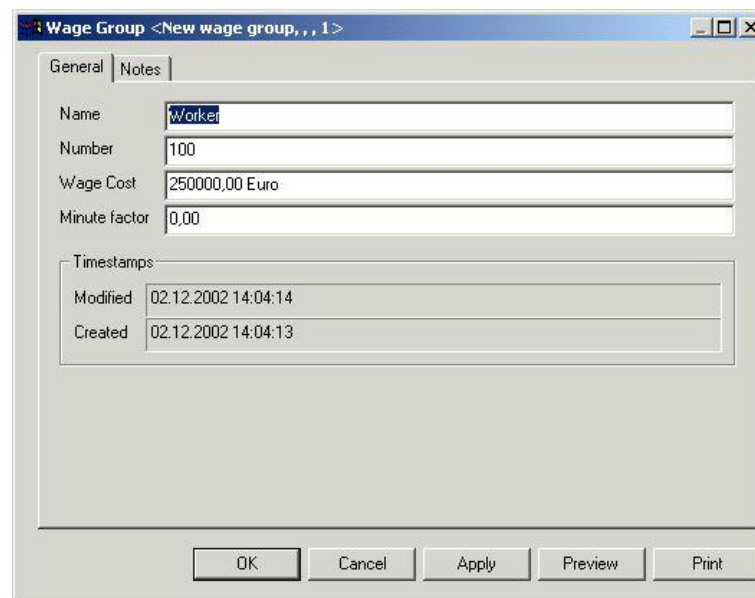


Figure 38: Wage Group Properties Dialog

8. Medium

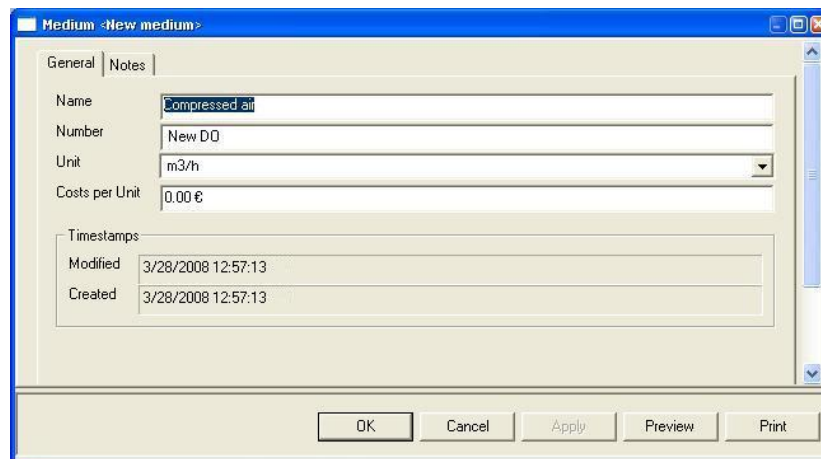
8.1 Assigning Medium

Determine the individual medium in the **Properties** dialog. You have to redefine the properties each time for each medium, such as compressed air, electricity, or water.

- 1) Create a new medium in the project library under **Media**. You can get to the **Properties** dialog of the wage group for editing by double clicking or by using the context menu of the right mouse button.
- 2) Click right mouse button to get to the context menus for the input fields, for example, to specify the currency for the input field **Costs**.



Figure 39: Create New Medium



Timestamps	
Modified	3/28/2008 12:57:13
Created	3/28/2008 12:57:13

Figure 40: Medium Properties Dialog

9. Calculation Models, Code Rules, and SA Codes

SA Codes (Special codes)

In order to control complex product structures, most companies have so-called control codes that describe the variants in logical mathematical expressions. The control codes in the PPR Navigator are called **SA Codes** (special codes). Each SA code describes either the standard product or some special equipment. The individual codes are linked by code rules.

Code rules consist of one or more SA codes that are logically linked together. For example, a code rule "m1+k3" could designate the work plan for a product variant that contains the two special codes "m1" and "k3". A code rule "m1/k3" on the other hand would designate the work plan for a product variant that contains the special code "m1" or "k3".

Calculation models are used to show or filter out from complex structures only project data that is stored in the model. A calculation model is a list of SA codes. It describes a product variant, feature or product model that precisely fits the list of special equipment.



Note

The information on code rules applies to plan codes as well. A calculation model is generated in relation to the project and can therefore only be set as a filter for the respective project.

9.1 Determining the Operators

The logical mathematical operators that can be used for a calculation model are specified in the project.

- 1) Open the **Properties** dialog in the uppermost structure item (project nodes) in the object structure tree.
- 2) Open the **Filter** tab.
- 3) Click list boxes and select a mode and calculation type for the frequencies.
 - The **absolute** calculation method determines the frequencies based on the code assigned to the objects.
 - The **relative** calculation method searches through the tree structure for a specific object and first determines the code rule for the structure. The frequency is then calculated.

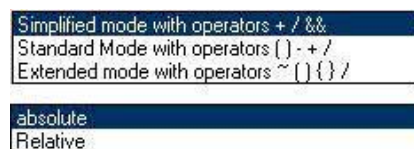


Figure 41: Selecting a Mode in the "Properties" Dialog/Filter of the Project Node

The following modes are available for selection:

Table 10: Modes and Operators

Mode	Operators
Standard mode	<p>+ AND operation</p> <p>/ OR alternatively</p> <p>() Brackets</p> <p>- Negation</p>
Simplified mode	<p>+ AND operation</p> <p>/ OR alternatively</p> <p>& Linking of expressions with a weak OR</p> <p>& link according to the placement of brackets in the standard mode, e.g. A+B & D+C corresponding to (A+B)/(D+C)</p>
Extended mode	<p>/ OR alternatively</p> <p>() open and close brackets; corresponding to placement of brackets in standard mode</p> <p>, AND</p> <p>~ NOT; negation</p>

4) Quit the Properties window using the **OK** button.

9.1.1 Important Points for SA Codes and Code Rules



Note

For SA codes you can only use **specified characters**: uppercase and lowercase (A-Z, a-z) and the figures zero to nine (0-9).

- These allowed characters correspond to the ANSI characters 48 – 57, 65 – 90, 97 – 122.
- An SA code can be made up of alphanumeric characters or of uppercase and lowercase letters.
- The following characters must not be used in SA codes: **special characters, spaces, and diacritics**.

There is only one code rule with the same syntax for one project, in other words: several components, bill of materials entries, ergoitems (items of the project library), and relations are allocated just one code rule object which then applies to all. In addition, the objects mentioned can reference the code rule object as code rule (or as planning code).

This is why code rules can appear several times in the result dialog.

Code rules have a global status and thus a clear syntax within a project.

- Code rule objects can no longer be deleted automatically when deleting an Ergo component, a parts list entry or a relation.
- Code rule objects are visible in the project library.

- Code rule objects can be assigned to components using the drag and drop function (except for plan codes).
- If a code rule with correct syntax is entered in the **Properties** dialog of a component or ergoitem, its application (= bill of material entry) or a relation, then the system first checks whether this code rule already exists. If there is an existing code rule, the code rule found is referenced. If no code rule is found, this rule is generated (and get immediately visible in the project library).
- Code rules in use, i.e. referenced by components, bill of material entries, relations, and ergoitems, cannot be deleted.
- SA codes can be assigned to calculation models using the drag and drop function. It is first checked as to whether one SA code is to be assigned to several calculation models.
- SA code operators can neither be deleted nor renamed.

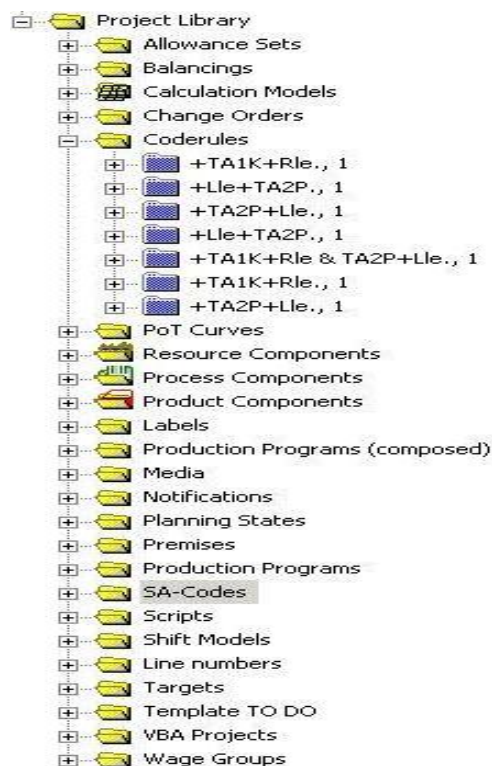


Figure 42: Code Rules in the Project Library

9.2 Introduction to SA Codes

To create calculation models, all SA codes and operators used in the project must be entered in the project library. SA Codes can be imported from an external text file or entered manually.

9.2.1 Importing SA Codes into Projects

A text file must be available in order to import. The text file can be structured, for example, as in [Figure 43](#).

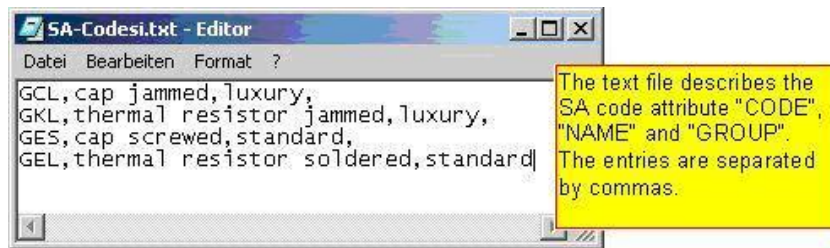


Figure 43: Example of an SA Code – Text File



Note

The entries in the text file must be listed separately using a defined character. You can also import SA codes with more than the three standard attributes (NAME, CODE, and GROUP). You can get a more detailed description from our support department.

- 1) Click Tools < Import < SA Codes.

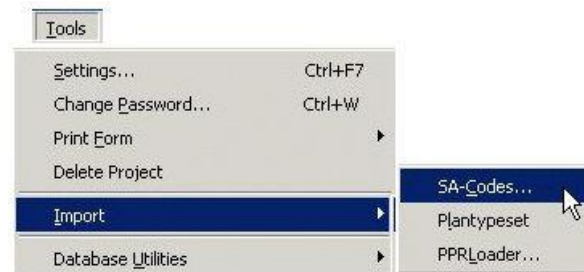


Figure 44: Starting to Import SA Codes

- 2) The Import SA-Codes dialog opens.

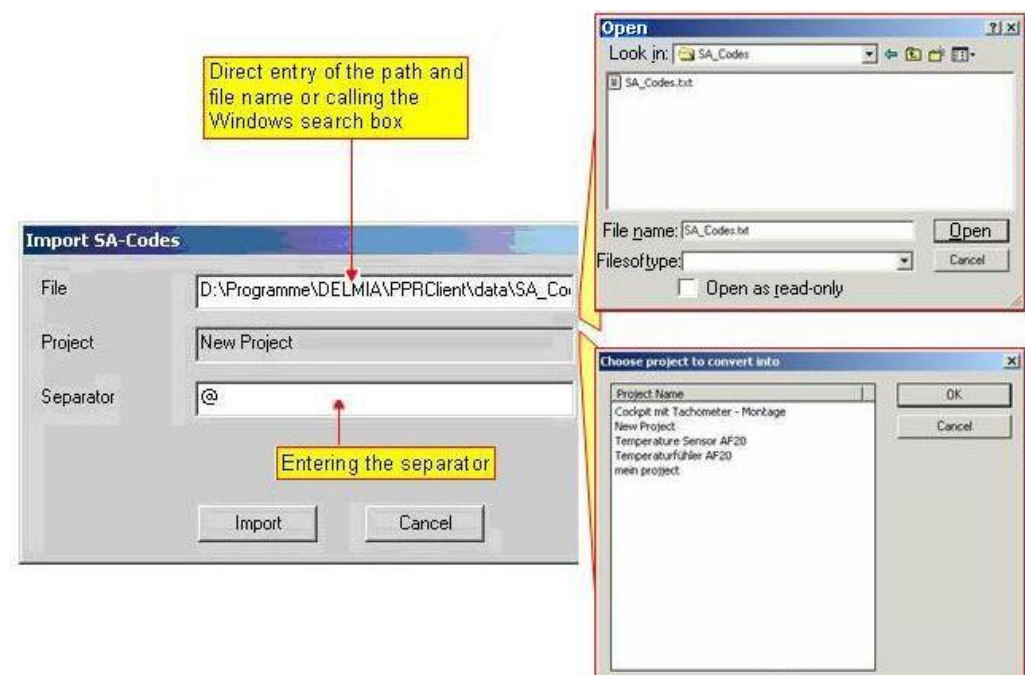


Figure 45: Import SA Codes Dialog

- 3) Determine the SA codes for a project. Specify to which project the SA codes are to be imported:

- 4) Enter the file path and file name in the **File** field or select the search box to search for the file in the Windows directory. In the second instance, the path name gets automatically assigned after marking the file and clicking **Open**.
 - 5) Open the project selection window and mark the project.
 - 6) Confirm the selection by left-clicking on “OK”. The project name will then be automatically transferred to the “Project” field.
 - 7) Enter the character in **separator** field that was used to separately represent the expressions in the text file.
 - 8) Left click **Import** button to start loading the SA codes from the text file into the selected project.
- The SA codes thus imported appears in the project library.
- 9) Open the project to which you have imported the SA codes.
 - 10) Open the structure tree **SA Codes** and then the structure tree **Token list**.
 - 11) The imported SA codes and the operators are displayed in the structure tree.

The entries in the text file must be listed separately using a defined character, i.e. a semicolon.

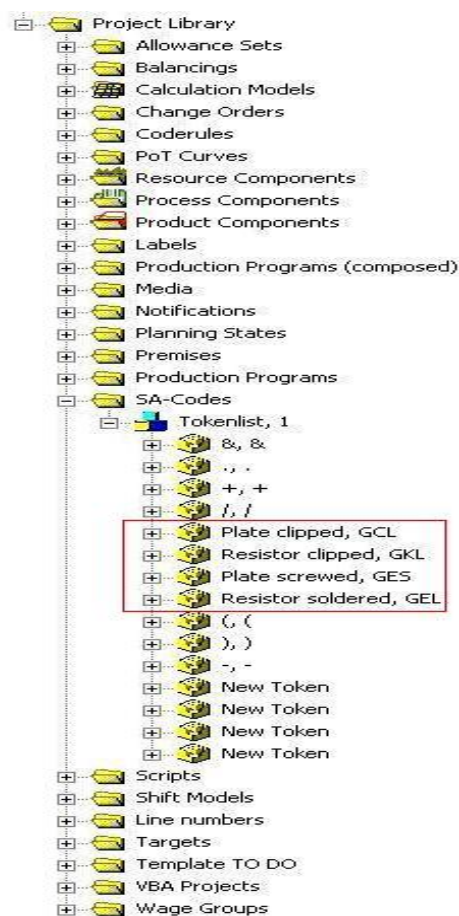


Figure 46: “SA Codes” Structure Tree+

9.2.2 Manual Creation of SA Codes

The list of SA codes can also be created or expanded manually.

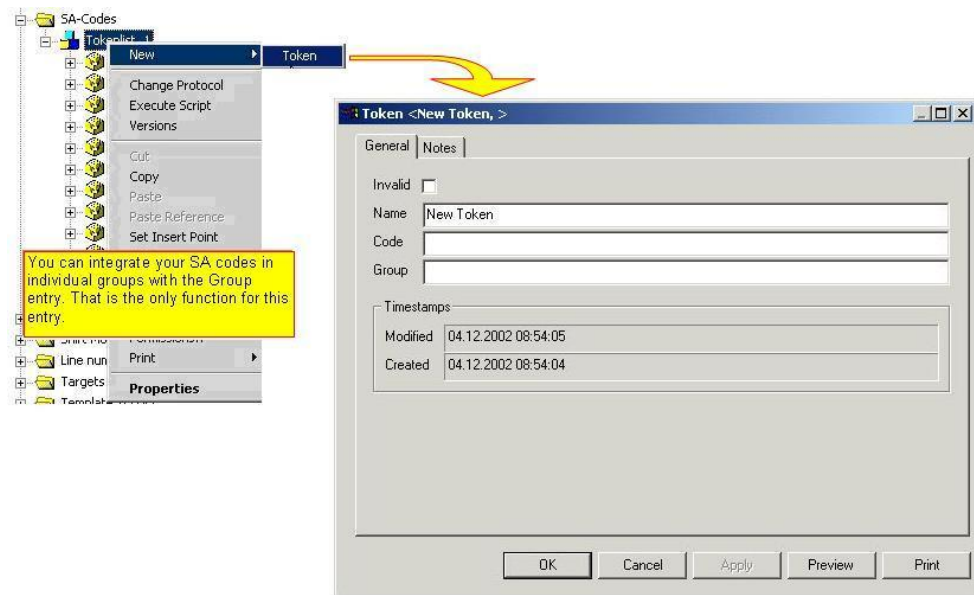


Figure 47: “SA Codes” Structure Tree

- 1) Open the project in which you want to use the SA codes.
- 2) Open the **SA Codes** structure tree in the project library and generate a new **Token List** (SA code list).
- 3) Right click object nodes Token list and select **New**.
- 4) Open the dialog by left clicking **Token**.
- 5) Enter name, code, and group in the respective text fields and confirm by clicking **OK**.

The created SA code appears in the structure tree.



Note

If you change the code of an SA code, you must always select the menu item “Replace code” in the context menu of the project afterwards. This ensures that the changed code get replaced in all other areas of application of the project. SA codes must have a distinct ‘CODE’ for the entire project.

9.3 Introduction to Code Rule

Code rules refer to the logical expressions, in which the SA codes have been linked to logical mathematical statements by means of operators. Code rules are automatically generated from applicable SA codes and corresponding operators.

Entering the Product Code Rule

In companies that have a large number of variants in their product line, the code rules are determined during the development stage of the products.

- Loading of a so-called design bill of materials can be done via the PPR Loader.
- Of course, code rules can also be entered for a manually created product structure.

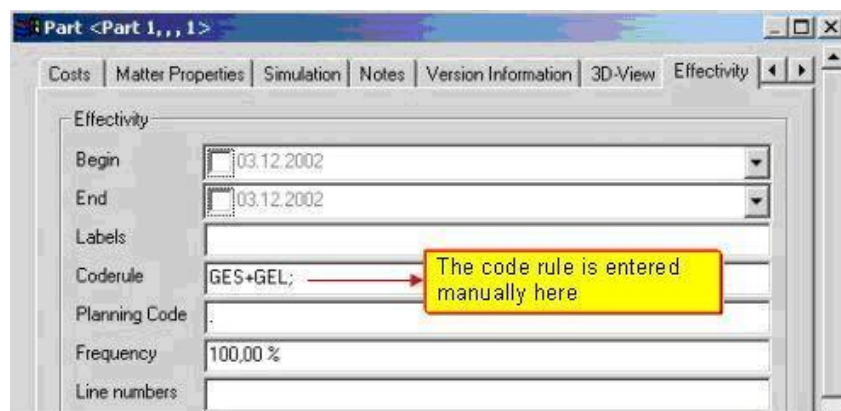


Figure 48: Entering Code Rules for Manually Created Product Structures

Open the **Properties** window of the product component and enter the statement logic in the **Code rule** input field.

Alternatively, you can assign code rules (not planning codes) to components using the Drag and Drop function.



Caution

The SA codes entered must be available in the Token list, or the message shown in [Figure 49](#) appears.



Figure 49: Message “Character is not available in the Code List”

9.4 Introduction to Calculation Model

A calculation model a list of SA codes that describe a particular equipment variant. In many organizations only certain variants are used as the basis for calculated observations.

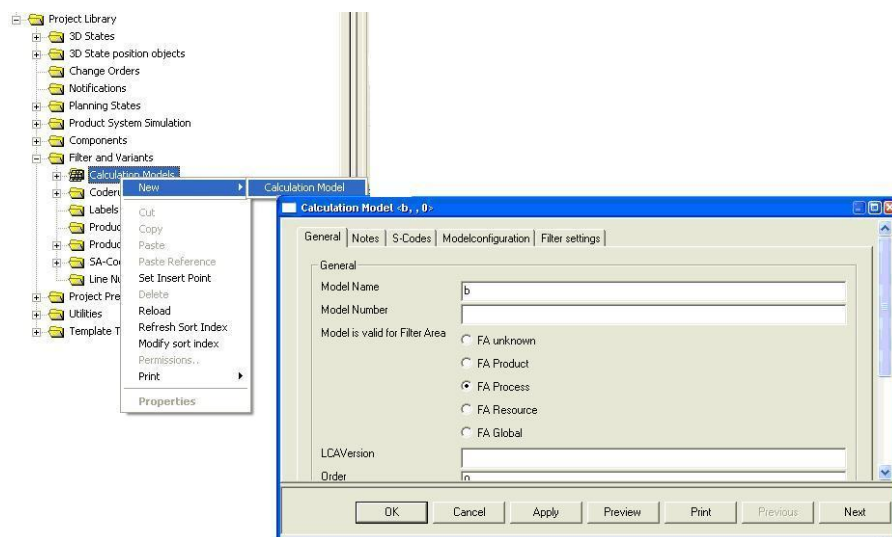


Figure 50: Generating a New Calculation Model

To Create a Calculation Model

- 1) Open the project library structure.
- 2) Click **Calculation Model** structure nodes.
- 3) Use **New** to select **Calculation Model**. The **Calculation Model** dialog opens.
- 4) Select the logical operators for the project.
- 5) Import or enter the SA codes in the project library.
- 6) Import a product structure with code rule information or manually enter the code rules for the product components.
- 7) Create a calculation model.
- 8) Enter the logical expression for the calculation model.
- 9) Open the project again with a set calculation model filter.



Note

A calculation model is generated in relation to the project and can therefore only be set as a filter for the respective project.

9.5 Working with SA Codes and Code Rules

If you call the **Code rules** entry in the context menu of the top node - the **project nodes** - four selection options are displayed. These functions are explained in more detail below.

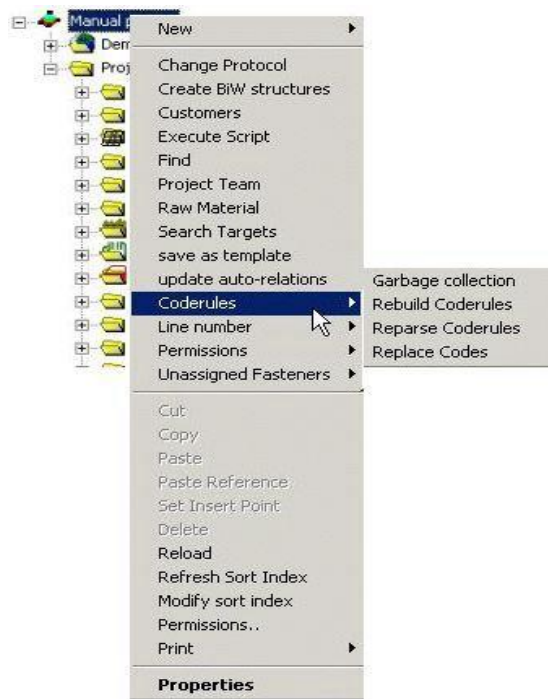


Figure 51: "Code Rules" Entry in the Context Menu of the Project Node

9.5.1 Rebuilding Code Rules -> Recalculating Code Rules

Rebuild Coderules

By right clicking project nodes and selecting **Rebuild Coderules** in the context menu, checking of the code rules is started.

You can calculate the process and resource code rule automatically using code rules from relations of linked products/processes.

- **Process:** The code rule is created by or links from all code rules of linked products.
- **Resource:** The code rule is created by or links from the code rules of all products directly linked by relations and all products indirectly linked by processes.



Note

*Code rules can only be generated automatically if the **Protect effectivity** option is deactivated in the Properties dialog of process and resource components.*

The result is displayed as follows:

Protect effectivity ☐

Component	V	Code...	Object...	Old Code rule	New Code rule	Status
Overall Workplan	1	CR	C			code rule unchanged
Injection Moulding (...)	1	CR	C			code rule unchanged
Injection Moulding (...)	1	CR	C			code rule unchanged
Injection Moulding (...)	1	CR	C			code rule unchanged
Injection Moulding (...)	1	CR	C			code rule unchanged
Injection Moulding (...)	1	CR	C			code rule unchanged
Stamping (bracket)	1	CR	C			code rule unchanged
Bending (bracket)	1	CR	C			code rule unchanged
Drilling (back plate)	1	CR	C			code rule unchanged
Drilling (plate)	1	CR	C			code rule unchanged
Housing preassembly	1	CR	C			code rule unchanged
Soldering (resistor)	1	CR	C			code rule unchanged
Final assembly	1	CR	C			code rule unchanged
Packaging	1	CR	C			code rule unchanged
Cycle 1	1	CR	C			code rule unchanged
Cycle 2	1	CR	C			code rule unchanged
Cycle 3	1	CR	C			code rule unchanged
Cycle 4	1	CR	C			code rule unchanged
Cycle 5	1	CR	C			code rule unchanged
Cycle 6	1	CR	C			code rule unchanged
Cycle 7	1	CR	C			code rule unchanged
Test	1	CR	C			code rule unchanged
New Operation	1	CR	C			code rule unchanged
New Workplan	1	CR	C			code rule unchanged
Product Updates	1	CR	C			code rule unchanged

Figure 52: Display of Code Rules

All components within the project are checked for code rules. The result of this evaluation of attribute entries is displayed in a list. If a code rule has changed, the new value is indicated under **New code rule**.

The status displays whether the SA codes of the code rule are present in the code list (Token list) or if the list needs to be expanded.

The **Close** button ends the evaluation.

9.5.2 Reparsing (analyzing) Code Rules

Reparsing Code Rules

For importing data via the EPDB Updater or the PPR-Loader into a new project, into an existing project without SA code list, and if an error occurs during parsing then the code rules is transferred without being analyzed and the import continues even if there are errors.

You can execute an analysis, a check and a conversion into a form of code rules that is known to the system even after completion (i.e. after having created an SA code list and the corresponding SA codes).

You can do this by selecting the **Reparsing code rules** in the project context menu. The result dialog displayed in [Figure 53](#) opens.

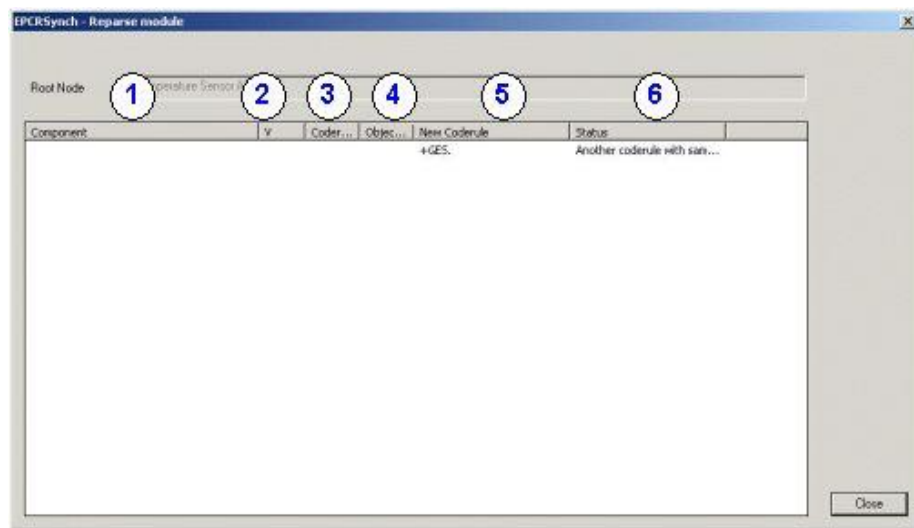


Figure 53: Display of Newly Created Code Rules

**Note**

Components, bill of material entries, ergoitems, and relations that have an unparsed code rule or an unparsed plan code are always visible, regardless of the filter settings used to open a project.

Table 11: Properties Description

No.	Properties	Meaning
1	Component	<p>Gives the name of the object which the code rule references:</p> <p>Null string: Code rule is not referenced (cf. column 6 (status))</p> <p>ABC -> DEF string: Bill of materials entry between the ABC and DEF components.</p> <p>ABC/DEF string (xxx linked to yyy): Relation between the ABC and DEF components.</p>
2	V	Version number
3	Code rule type	<p>PC: Plan code</p> <p>CR: Code rule</p>
4	Object type	<p>C: Component</p> <p>R: Relation</p> <p>B: Bill of material entry</p>
5	New code rule	The parsed code rule form
6	State	<p>Code rule unchanged: Reparsing caused no change.</p> <p>Code rule is not used: Code rule is not used as plan code or code rule (cf. column 3).</p> <p>Code rule reparsed: The code rule was successfully reparsed.</p> <p>An SA code list is not included in the project: Parsing impossible due to missing SA code list.</p> <p>SA code not included in the SA code list: The code rule contains SA codes which are not part of the project SA code list.</p>

9.5.3 Reparsing Code Rules – Replacing Codes

Replace Codes

With this function, you can check and restore the consistency of the code rules after you have changed SA codes. SA Codes can only be Changed in the Library.

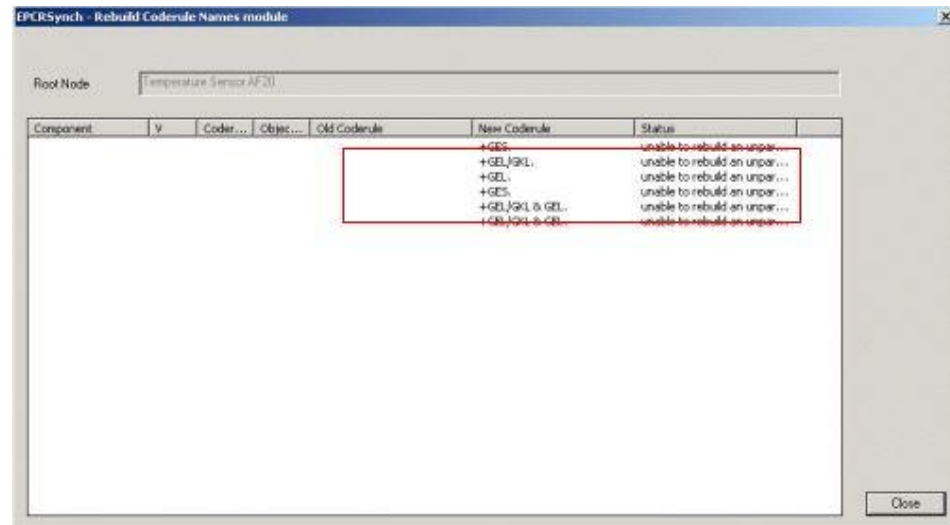


Figure 54: Rebuilding Code Rules

The following status messages are possible:

- Code rule is not used
- Code rule rebuilt
- Unable to rebuild an unparsed code rule
- Error messages

Changing Code Rules -> New Code Rule

If you change a component, a bill of materials entry or a relation of a code rule, the referenced code rule do not get changed. A **new code rule** is created and referenced.

You can change code rules in the project library. The algorithm used blocks (locks) all referenced objects before they are renamed. The code rule is only renamed and the code rule string that is kept redundant in components, bill of materials entries or relations is only updated if all referenced objects are successfully locked.

9.5.4 Deleting Unused Code Rules

Garbage collection

This function allows you to delete code rules that are not being used.

9.5.5 Resource or Process Component Context Menu

Allow or forbid overwriting Rebuild Coderules

For technical process and resource components, you can calculate the code rules from the products/processes linked via relations in the context menu using **Code rules < Rebuild code rules**.

Using the context menu item **Allow or forbid overwriting**, generation of the code rule can be activated or deactivated from the linked objects. This applies recursively to all children of a process or resource.

In the control box **Protect effectivity** of the **Properties < Effectivity** dialog for process or resource objects, the checkmark is automatically set or removed. Please refer to the [Figure 55](#).

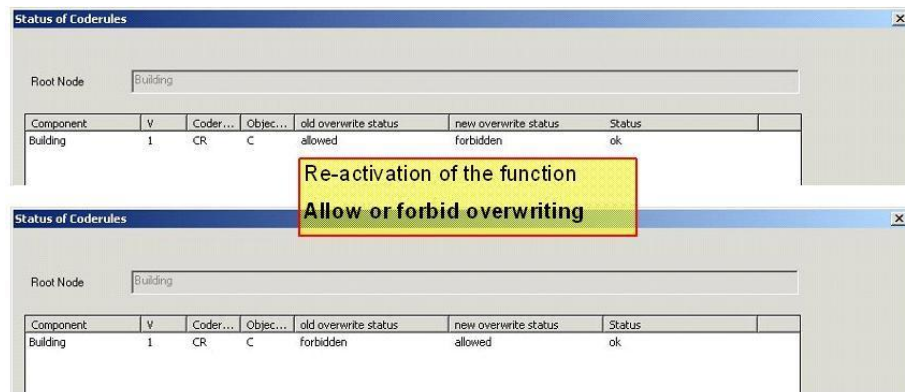


Figure 55: Example of the Result Dialog Displayed while Overwriting the Automatically Generated Code Rules

9.5.6 Displaying Code Rules Applications

Open the **Find usage data** entry in the context menu of a code rule to see all applications of the code rule. There are two possibilities:

- With **general** usage data: all applications of the code rule are displayed. General data may include components, bill of materials list entries, and relations.
- In the case of **special relations** data, the applications of the code rules can be displayed in different versions.

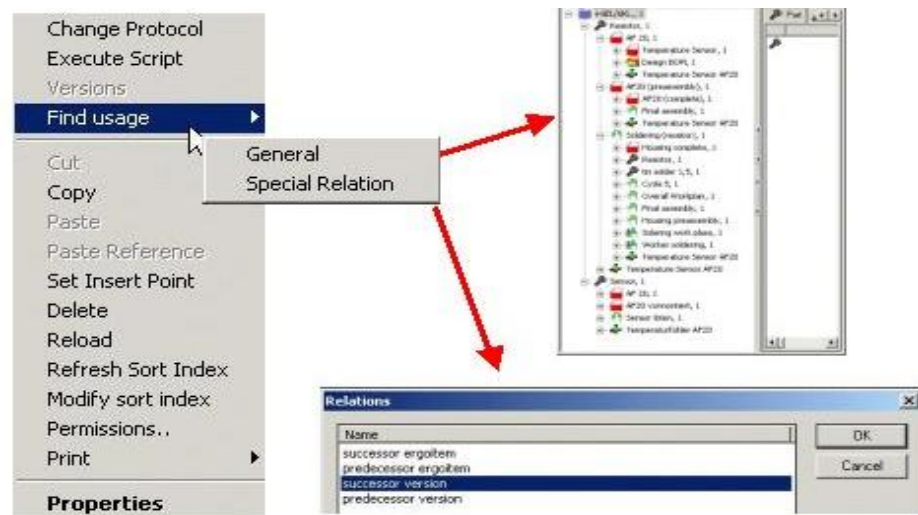


Figure 56: Find Usage Data

9.6 Introduction to Production Programs

A production program determines the number of pieces to be used for manufacturing a standard product or its equipment variants. A production program consists of one or several calculation models and the number of pieces used to manufacture this calculation model.

Each object in the Process Engineer that has a code rule can now be checked for validity using the SA code defined in the calculation model. Validity is checked by inserting the truth values in the individual SA codes of its code rule. SA codes that are specified in the calculation model receive the truth value TRUE, whereas SA codes that are not specified receive the truth value FALSE. The truth value of the code rule results from the propositional evaluation of the truth values of the SA codes contained within.

An object is valid with regard to a calculation model if the truth value of its code rule is TRUE. The frequency of this object results directly from the frequency of its code rule, and expresses the relation of the sum of the number of pieces of all calculation models in which the object is valid to the total sum of all numbers of pieces of all calculation models in a production program. *Please refer to the [Calculation Models, Code Rules, and SA Codes](#).*

9.6.1 Creating a Production Program

A production program is created in the project library.

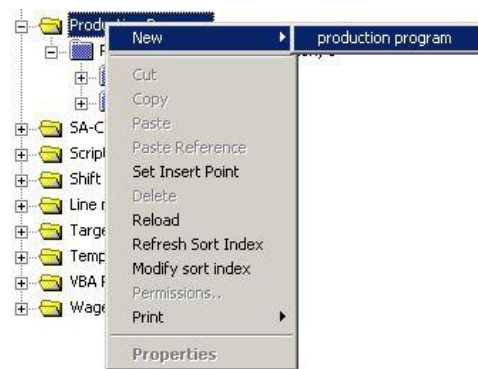


Figure 57: Context Menu – Creating a Production Program

- 1) Open the project library in the PPR Navigator.
- 2) Select the production programs and open the context menu.
- 3) Create a new production program using the **New** menu item. *Please refer to the Figure 57 and Figure 58.*

In the properties dialog of a production program, in addition to naming the production program, you can also specify whether this production program is to be used for determining frequencies. If there are too many linked calculation models, a relation to an external file containing a list of calculation models can also be specified here to enable optimal management in the Process Engineer.



- 4) Select the checkbox **Active** to use this production program as the basis for starting the frequency calculation. There must be at least one active production program in the project in order to carry out a frequency calculation.

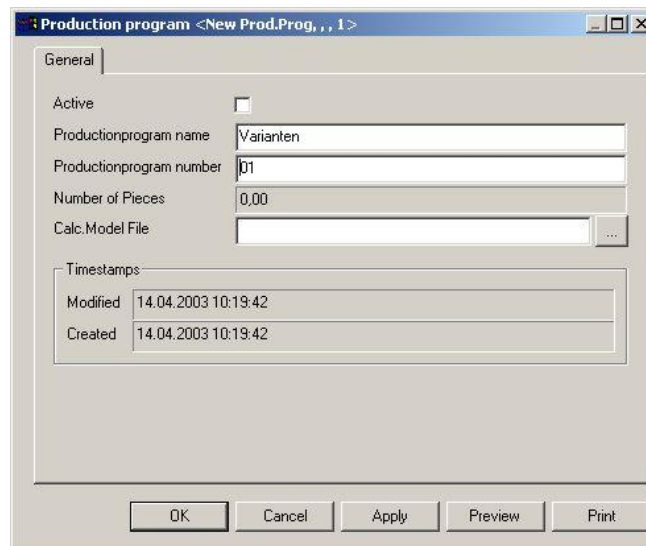


Figure 58: Production Program Properties Dialog

9.6.2 Linking Calculation Models with a Production Program

You can link calculation programs to a production program using the drag and drop function. The number of pieces indicated when using a calculation model can be changed at any time without having to remove the calculation model from the production program. This approach allows you to quickly and easily include revised production criteria in an existing production program.

- 1) Select the calculation program from the project library and move it to the production program using the drag and drop function.

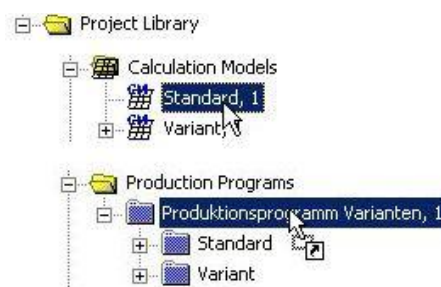


Figure 59: Link Calculation Model using Drag and Drop

9.6.2.1 Entering Number of Production Pieces

- 1) Open the properties dialog using the context menu.

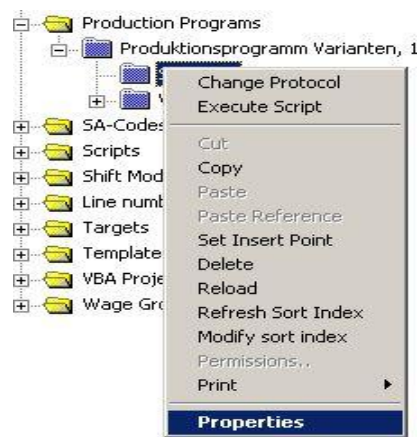


Figure 60: Open the Properties Dialog via the Context Menu

2) Enter the number of production pieces in **Number of Pieces** field.

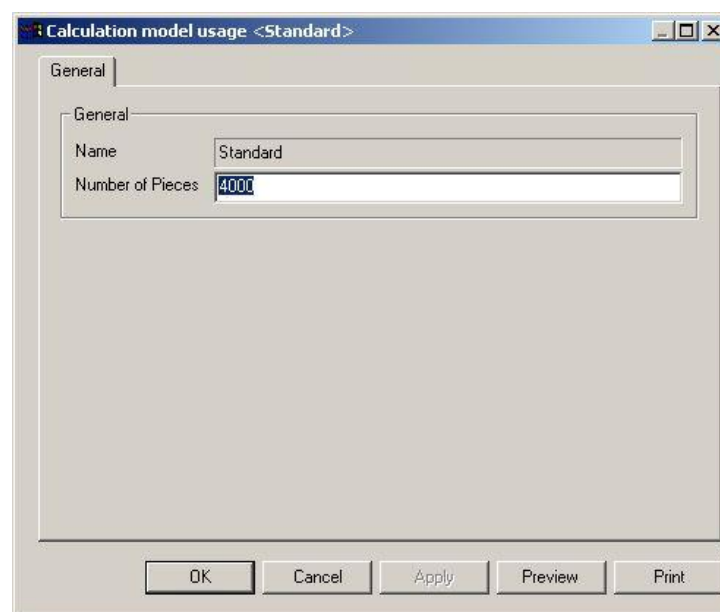


Figure 61: Specify Number of Pieces in the Calculation Model

9.6.3 Determining Frequency for a Product

You can determine the frequency for an individual object as well as for an object together with its substructure. You only need to determine the frequency one time. The frequency only needs to be re-determined if changes have been made in the production program. The results are displayed in the Listview of the selected structure and in the properties dialog of an equipment variant.



Note

Using the **Re-calculate frequency** function to determine frequency for a particular node is a faster method. You should use this function if the frequency is to be calculated exclusively for this node and if you want to get the results quickly.

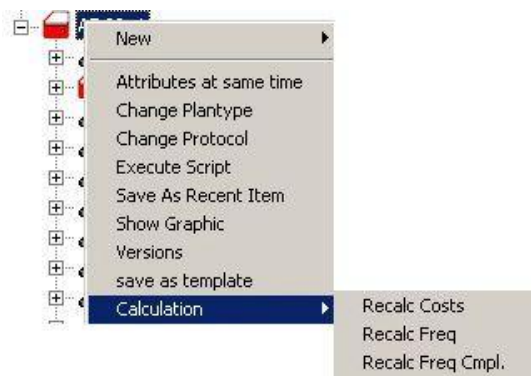


Figure 62: Start Frequency Calculation

- 1) Select product from the product structure
- 2) Open the context menu.
- 3) Select **Calculation** from the menu.
- 4) Select the menu item **Recalc Freq (Cmpl.)**, which means that the frequency of the respective product structure is also determined.
- 5) Select the menu item **Recalc Freq**, which means that the frequency is only determined at the hierarchical level (node) of the selected product.

Example for Determining Frequency

Example

Two calculation models (standard and variant) are assigned to the **Variants** production program with various lists of SA codes and number of pieces. The two equipment variants, **A** and **B**, which each contain components with different code rules, can be found in the structure for which the frequency is to be determined.



Figure 63: Example of a Production Program with two Calculation Models

- **4000 pieces** are specified in the Standard calculation model
- **6000 pieces** in the Variant calculation model

The code rules in equipment variant B are valid for the SA codes of the Standard calculation model. But those of equipment variant A are not. The code rules of equipment variant A are met exclusively by the SA codes of the Variant calculation model.

Thus **10,000 AF 20 products** can be manufactured with the entire **Variants** production program. The percentage of frequency determined gives you an indication of how high the share is of a component of this equipment variant in relation to the entire production program.



Figure 64: Product Structure AF 20

Example**Displaying Results**

You can see the results of the frequency calculation in the Listview of the selected structure as well as in the **Properties** dialog of the equipment variants. None of the parts with a result of 100% in this example contain any code rules and must be produced at 100% if the **AF 20** product is to be manufactured.

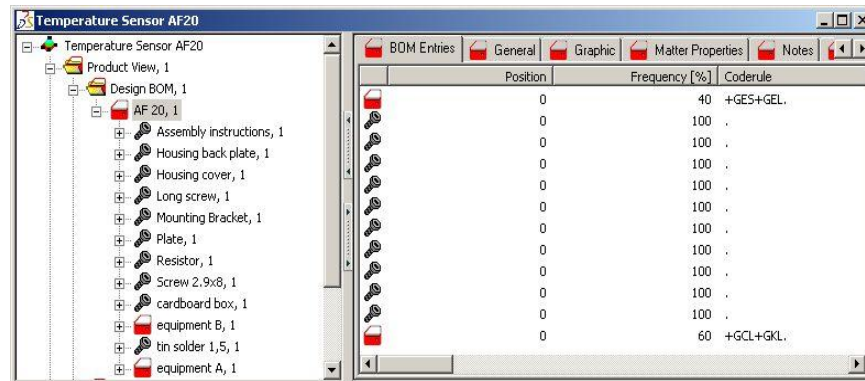


Figure 65: Selected AF 20 Structure with Display of Percentage in the Listview

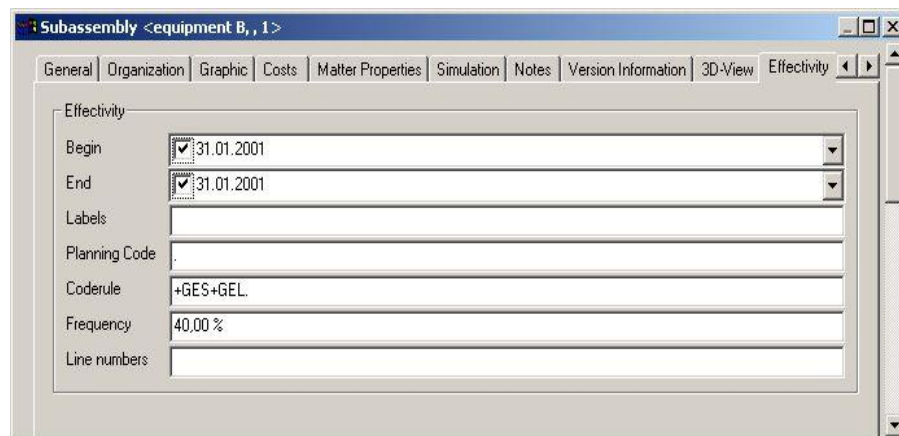


Figure 66: Equipment Variant Properties Dialog – Code Rules and Percentage Frequency

9.7 Introduction to Line Number

The Line Number is a unique identification of a specific end product with all of the related product, process, and resource components.

Line Numbers are used for customized articles, for the clear specification and comprehensibility of the existing product, process, and resource structure.

The Line Number originated from the aircraft industry where each plane, although belonging to a certain type, can differ from other planes of the same type in terms of its final equipment.

Example

An **X** end product (including all proper features) has a Line Number 1.

The manufacturing process of the **X** end product includes all product, process and resource components, which are set to **valid** for the Line Number 1.

You can filter your search in the DELMIA Process Engineer® using the Line Number. Thus, only the product, process and resource components assigned to a certain Line Number are displayed.

9.7.1 Creating the Line Number



Note

The Line Number **must** be a **numeric** positive digit. You can use as a special character: a comma “,”, a minus sign “-“, or an exclamation mark “!”.

A Line Number is an object in the project library and can be generated and used in the same way as an SA code.

- 1) Open the project library and select the Line Number entry. Select **New** in the context menu.
- 2) Specify the name (for example, S 822) of the Line Number and a numeric Line Number (for example, 1) in the dialog box.

The Line Number is unique. Therefore, you cannot assign the same Line Number twice. If you have generated Line Numbers ranging from 1 to 10 and allocate 12 afterwards, the 11 is displayed as default when recreating new Line Numbers.

9.7.2 Assigning Line Numbers

Each component can be assigned a Line Number. This can either be done when generating a component or afterwards.

- 1) Open a component using the **Properties** context menu and select **Effectivity** page.



Note

In the standard configuration, the "Validity" page is displayed with all components. If this page is not displayed for any reason, you need to show it in the configuration manager or in the project plan type set.

Part <Construction Part, 1>

Version Information | 3D-View | Effectivity | Plantype Information | Attachment | Usage Data

Effectivity

Begin: ☒ 03.12.2002

End: ☒ 03.12.2002

Labels:

Coderule:

Planning Code:

Frequency: 100,00 %

Line numbers: 1

or

Effectivity

Begin: ☒ 03.12.2002

End: ☒ 03.12.2002

Labels:

Coderule: GES/GEL

Planning Code: GES

Frequency: 50,00 %

Line numbers: 1-7,10-22,23,5-123

OK Cancel Apply Preview Print

Figure 67: Assigning Line Numbers

- 2) You can enter single Line Numbers (for example, number 1 only) in the form of a list (for example, 1, 2, 3 ...), as an area or according to the exclusion principle. Please refer to the [Figure 67](#). A list is separated by commas. If the area specification is 1-7, this component is valid for the Line Numbers 1, 2,...7.

9.7.2.1 Entering Single Line Numbers

You can enter single Line Numbers from 1 to 2,147,483,647 by default. Negative digits cannot be entered.

If you want to change the area of numbers, proceed as follows:

- 1) Open the configuration manager first. Then enable the **Tailnumber**.
- 2) Open the linenum attribute, Please refer to the [Figure 68](#).

Configuration Tool

subcompviewitemlistprocess (BOM)

subcompviewitemlistresource (BOM)

systemelementroot (Work System Component)

tailnumber (Line Number)

Base Type: ergoitemdefault (Default item)

Attributes

Line # (linenum)

Name (name)

Notes (note)

Number (nameshort)

version number (versionnumber)

Layout

tailnumberfolder (Line Number)

target (target)

targetarea (Target Area)

targetfolder (Target)

targetinvestment (Target Investment)

By Category | Alphabetical

Basics

Name: linenum

Physical name: m_Linenum

Prompt: Line #

Data Type: Integer

Control type: Edit

Group: Group::9001 (Line Number)-Page::9001 (Line Number)

Description:

Use master: No

Data Type Definit

Figure 68: Select Linenum

- 3) Enter the size in the **properties Integer min** and **Integer max** on the right side. *Please refer to the [Figure 69](#).*

Data Type Definit	
Length	64
Precision	0
Unit category	
Unit	
Integer min	1
Integer max	2147483647
Double min	0,0000000000000000
Double max	999999999,9999008000000000
Default value	1
Copy prefix	

Figure 69: Properties Menu

Use a minus sign to enter area specifications, for example, **1-20, -5**; i.e. the area contains all digits ≤ 5 , **5 -**; i.e. all digits from **5** to **2,147,483,647**.

Entering Exclusion Criterion

Note

*You can specify the exclusion criteria when entering areas; if you enter the areas **1-3** and **5-7**, for example, you can exclude the **Line Number 4** before even starting.*

If you do not want to filter certain Line Numbers for an area, you can exclude these digits using an exclamation mark, for example:

- **1 – 7 ! 4**. This specification will filter all Line Numbers of the area specification except for **digit 4**.

Another example of the exclusion criterion demonstrates the flexibility of the **exclamation mark** exclusion criterion. Take for example **!13**. This means that all Line Numbers from **1** to **12** and from **14** to **2,147,483,647** would be valid.

9.7.2.2 Transferring Line Number Validity from Products to Processes

Line Numbers of linked products are transferred to processes in the same way as code rules of products are transferred to processes. If, for example, a process is assigned three parts:

- Part 1 valid from 1-2
- Part 2 valid from 1-4
- Part 3 valid from 5-7

The process inherits the Line Number 1-7.

The transfer only takes place if you have **NOT** enabled the **Protect effectivity** checkbox on the **Effectivity** page in the process. *Please refer to the [Figure 70](#).*

Note

The checkbox “Protect effectivity” is used by the code rules and the Line Number.

Figure 70: Inheritance of Line Numbers

9.7.3 Filtering by Line Numbers

When opening a project, you can filter by Line Numbers. Filtering is used to generate a specific display in the three views (resources, product, and process view), which corresponds to the Line Numbers entered. *Please refer to the Figure 71.*

Figure 71: Using the Line Number as Filter – Opening Projects

- 1) Open the project dialog. Click button next to the **Filter**, the **Edit Filter** dialog opens.
- 2) Click button next to **Line Number Filter**. The **Linelist** dialog appears. In this dialog, you can see all available Line Numbers. *Please refer to the Figure 72.*

- 3) You can either select one or more Line Numbers in the top window by checking the number or by entering the Line Number directly in the field **Current Line**.

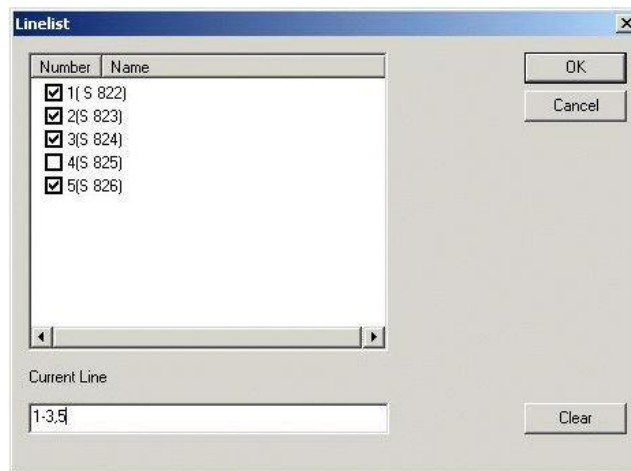


Figure 72: Line Number List Dialog – Enter Line Numbers

- 4) Click **OK** to confirm your entry. You can see the entered Line Number in the **Edit Filter** dialog. *Please refer to the [Figure 73](#).*

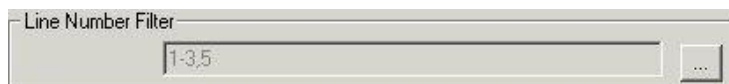


Figure 73: Line Number in Edit Filter dialog

- 5) On the project level, you can view the filtered Line Number via the context menu.
- 6) Select the project node in the PPR Navigator. Open **Project Library < Filter and Variants < Calculation Models**. Press the right mouse button and select **Properties**.
- 7) To view the Line Number, click **Filter Settings** tab. *Please refer to the [Figure 74](#).*

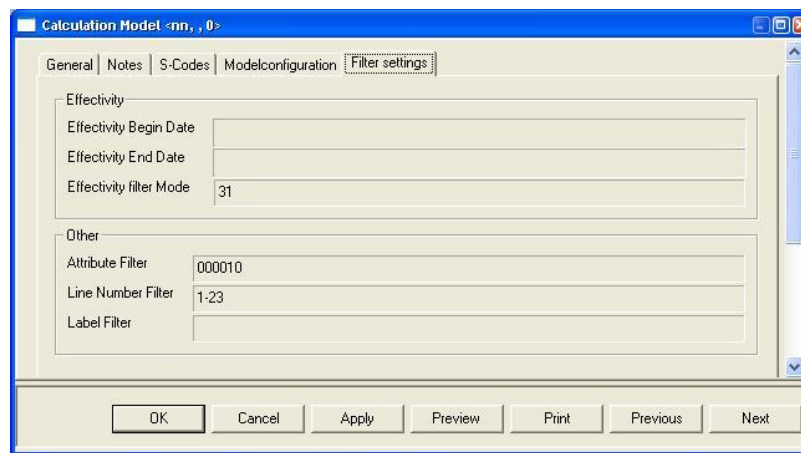


Figure 74: View Line Number Filter in Project Node

9.8 Introduction to Label Filter

Generally, a label refers to a designation or name. In the Process Engineer, labels are used as filters for objects in order to display a project according to the label filters set.

An additional filter was integrated in Version 5.10 of the DELMIA Process Engineer®. This filter is the **label filter**. The label filter is used to filter objects.

A label filter . is an object in the project library and can be generated and used in the same way as Line Numbers and SA codes.

In addition to label filters, label categories can be created. Also, under each label category, label filters can be created.

Thus there is a difference between labels assigned to a category and labels without a category. Labels **without** a category are called free labels.

Free labels correspond to the usual performance of filtering a project with label filters and have no category, as mentioned. Unlike labels with a category, a structured filtering of a project is not possible with free labels. Only objects that correspond to the selected label filter are shown in the project after filtering with free labels.

A structured expansion of the filtering process is possible with categorized label filters - for example, a categorized label filter could open a project in which only selected parts of automotive variants are shown.

9.8.1 Creating Labels or Label Categories

- 1) Open the project library and select under filter and versions the **Label** entry. Select **New** in the context menu and then select the object, which you want to create. *Please refer to the [Figure 75](#).*

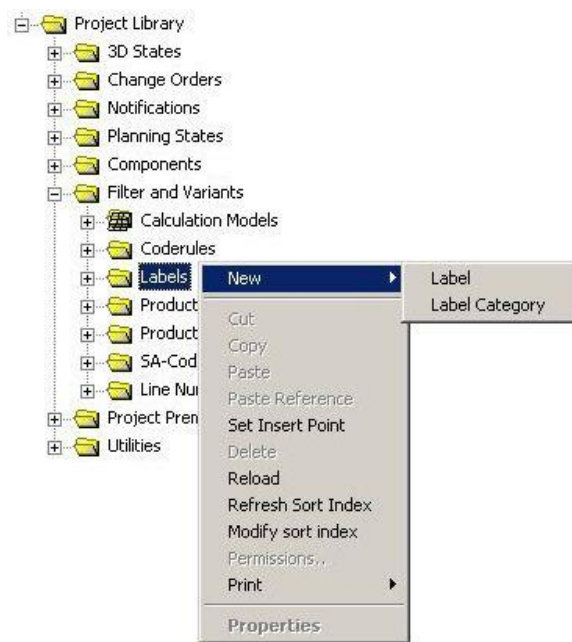


Figure 75: Creating New Labels and Label Categories

To Create a Label

A label is created in the project library. Please refer to the [Figure 75](#).

- 1) Configure **Label Code** in the properties dialog of a label [by default, the string value **New Label Code** and a new number are suggested (175391)]. The label code can be used as a label filter. All characters, except for the comma and separators between categories and labels can be used for the label code.
- 2) Additional information can be entered in the field **Description**.
- 3) When creating new labels the sortindex is set automatically corresponding to already existing labels. The sortindex allows for manual changes. The label is displayed in the directory according to the changed sortindex.

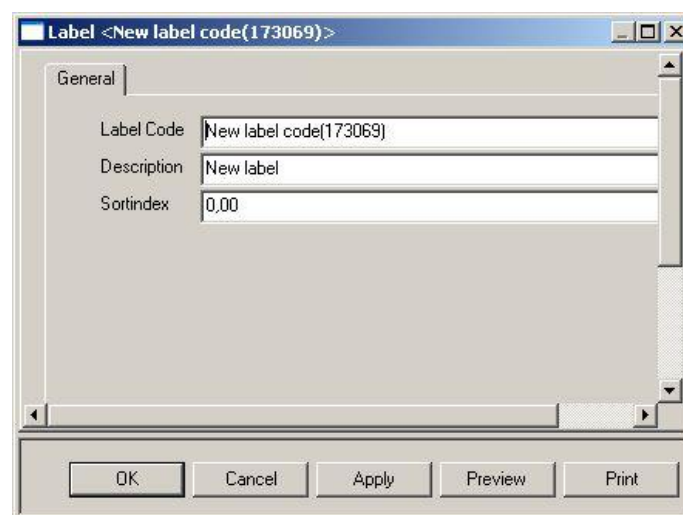


Figure 76: Properties of Label Filter

To Create a Label Category

Like the label, a new label category is created with the context menu in the project library. Please refer to the [Figure 75](#).

Figure 77: Properties of a Label CATEGORY

- 1) Enter the name for the label category in **Label Category** field.
- 2) An additional description of the category can be entered in **Description**.
- 3) If **Multi-selection Allowed** function is deactivated, only one label of this category can be assigned to an object . If this is deactivated and multiple labels of a category have been assigned, the following error message appears.



Figure 78: Error Message

If this function is activated, multiple labels of this category can be assigned to an object. By default, this function is deactivated.

- 4) If **Local Labels Allowed** function is deactivated, no local labels are allowed for this category. Local labels can be created in connection with ENOVIA only. In order to create local labels of this category, activate this function.
- 5) If a Category is marked as **Mandatory**, then one label of a mandatory category must be entered in the label filter setting. If no Label of a mandatory category is entered, the following error message appears.



Figure 79: Error Message

- 6) If **Valid if not set** function is activated, a label of this category is valid even if not set.
- 7) The sortindex can be changed manually or created automatically. The label is displayed in the directory according to the changes made in the sortindex.



Note

For every label category the sortindex starts with 0.00.



Caution

DO NOT use commas and the separator for the category for labels. Apart from these exceptions, all character combinations are permissible for label filters.

To Set the Separator for a Category

The following syntax must be used to allocate the label of a category to a filter criterion:

`<Category1>.<Label1>,<Category2>.<Label2>, ...`

The dot is predefined and serves as a separator between the category name and the label by default. A comma separates an individual label or categories. *Please refer to the [Assigning Label Filters](#).*

To change the separator, open properties on the project node and select **Filter** tab. Enter the separator into the input field **Category-Label Separator**.

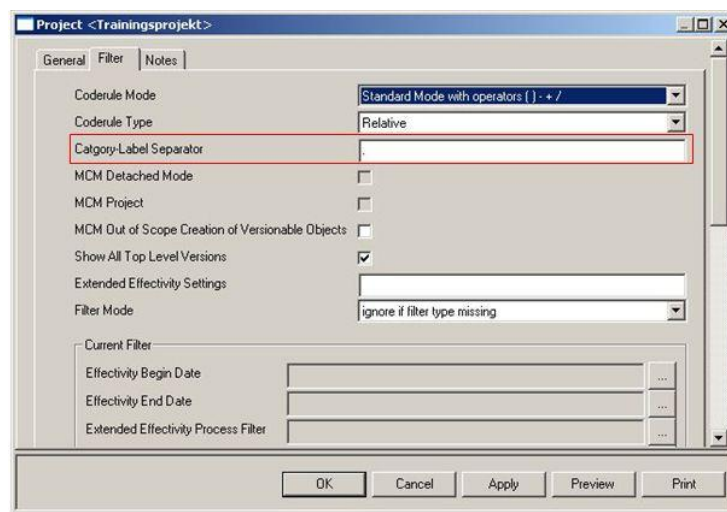


Figure 80: Setting the Separator for the Label Category



Caution

Only one character can be entered. The separator CANNOT be changed if label categories and label components have been assigned already. If you try nonetheless, the following error message appears.



Figure 81: DBEditor: Information

9.8.2 Assigning Label Filters and Label Categories

Each component can be assigned a label filter. This can either be done when generating a component or afterwards.

- 1) Open a component using the **Properties** context menu and select **Effectivity** page.
- 2) You can enter single label filters (**aa** only) or in the form of a list (**aa, bb, 20, ...**). A list is separated by commas.
- 3) Label filters and label categories can be assigned to individual Ergo-components by using drag and drop. The filter is then displayed in the **Effectivity** tab.
- 4) To define the filter for the bill of material entries (subcompitem = bom entries), you must enter the label filter on the usage data tab and in this case, in the Effectivity group.
- 5) To allocate multiple labels from different categories note the following:
Labels from the same category are linked by a logical OR.
Labels from different categories are linked by a logical AND.



Tip

Execute the following script on the top node of a structure in order to allocate a label category to a whole structure quickly.

```
Sub main(id)
    epbased = Data.GetAttributeById(id, "relationobject2")
    Data.SetAttributeById(epbased, "labels_deep", "Name.Name")
End Sub
```

This allocates the label category Name.name to all objects below. Attention needs to be paid to the correct separator and the existence of the labels and label categories in the project library.

Limitations

- The extended validity filter cannot use label categories.
- The separator between label category and label must not appear as a character in the label category name (attribute nameshort).
- Any allocated labels are not updated, when a label or label category name are changed.

9.8.3 Filtering by Label Filters

When opening a project, you can filter by labels. Filtering is used to generate a specific display in the three views (resources, product, and process view), which corresponds to the label filters entered. *Please refer to the [Figure 71](#).*

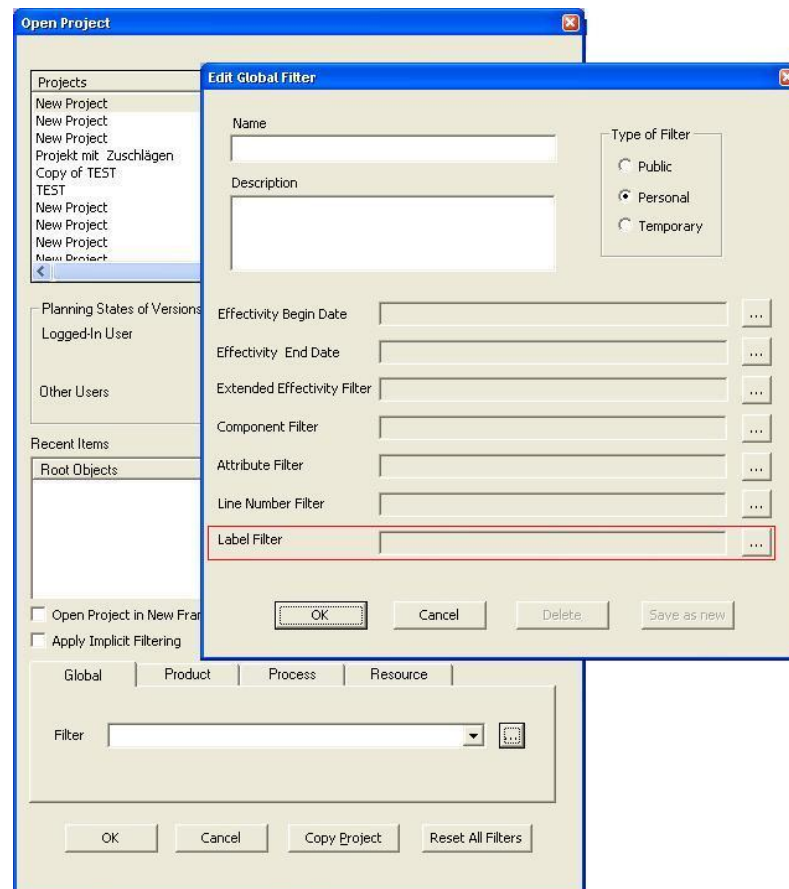




Figure 82: Using the Label Filter as Filter – Opening Projects

- 1) Open the project dialog. Click  button next to the **Filter**, the **Edit Filter** dialog opens.
- 2) Click  button next to **Label Filter**. The **Label Filter** dialog appears. In this dialog, you can see all available Label filters. *Please refer to the [Figure 82](#).*

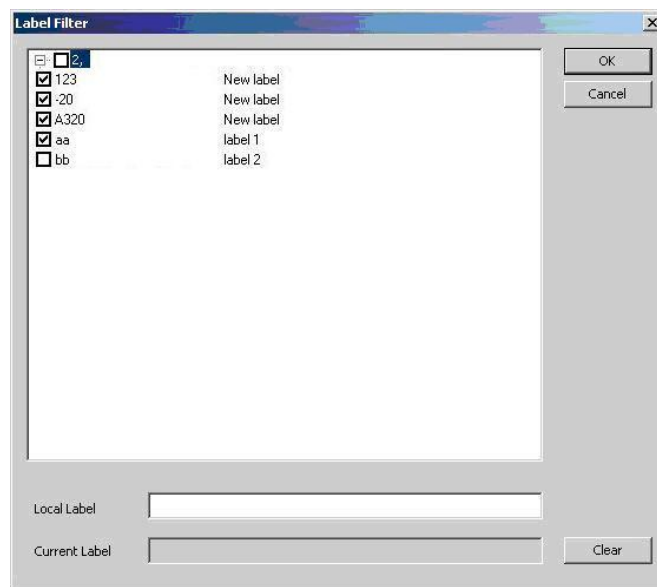


Figure 83: Label Filter Dialog when Opening a Project

- 3) You can either select one or more label filters in the top window by check-marking the number or by entering the label filter directly in the **Current Label** field.
- 4) Click OK to confirm your entry. You can see the entered **label filter** in the **Edit Filter** dialog. *Please refer to the [Figure 84](#).*

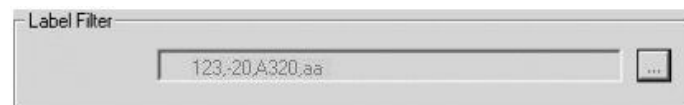


Figure 84: View Label Filter in Edit Filter Dialog

- 5) On the project level, you can view the filtered label filter via the context menu.
- 6) Select the project node in the PPR Navigator. Open **Project Library < Filter and Variants < Calculation Models**. Press the right mouse button and select **Properties**.
- 7) To view the label filter, click **Filter Settings** tab. *Please refer to the [Figure 85](#).*

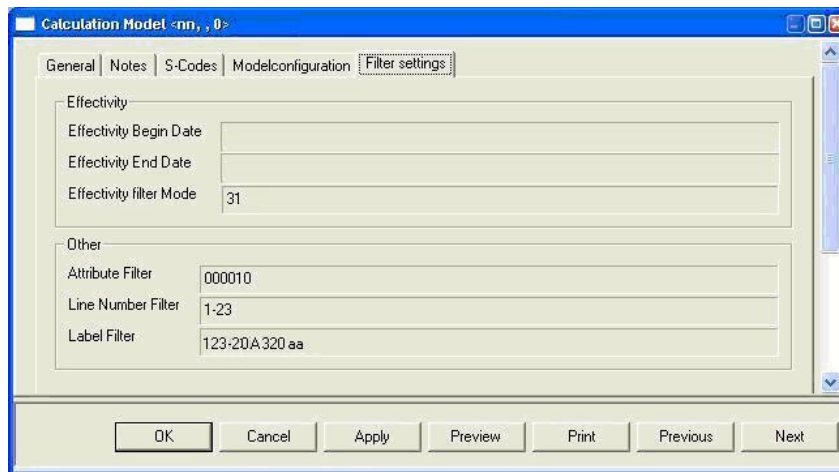


Figure 85: Context Menu on the Project Node Level

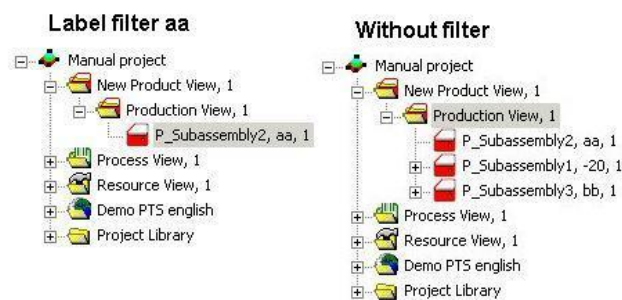


Figure 86: Example of a Project Filtered with Label Filter

**Note**

Applies to all filters: Starting with Version PE 5.10, the filter settings can be changed in the project node via the Properties dialog when a project is open. After the dialog is closed, the project is re-loaded. You therefore do not have to open the project first in order to filter it.

9.9 Introduction to Effectivity Filter

You can filter processes, products, and resources according to temporal effectivities.

Using an effectivity filter makes it possible to open projects so that only the objects (products, resources, processes) which correspond to the set time period are displayed. The time period is set via date mode and filter mode.


**Note**

*All objects of a structure which correspond to a structure are generally displayed. Valid objects of a structure are **not** displayed if the higher hierarchical level does not correspond to the set filter. These valid objects are displayed only with the respective plantype in the project library.*

The effectivity of an object is set in the respective properties dialog under the tab Effectivity.

A date mode is available for specifying the date; the date mode has three options according to which you can set the temporal effectivity for filtering.

9.9.1 Filtering by Effectivity Filter

- 1) Open the project dialog. Click  button next to the **Filter**, the **Edit Filter** dialog opens.

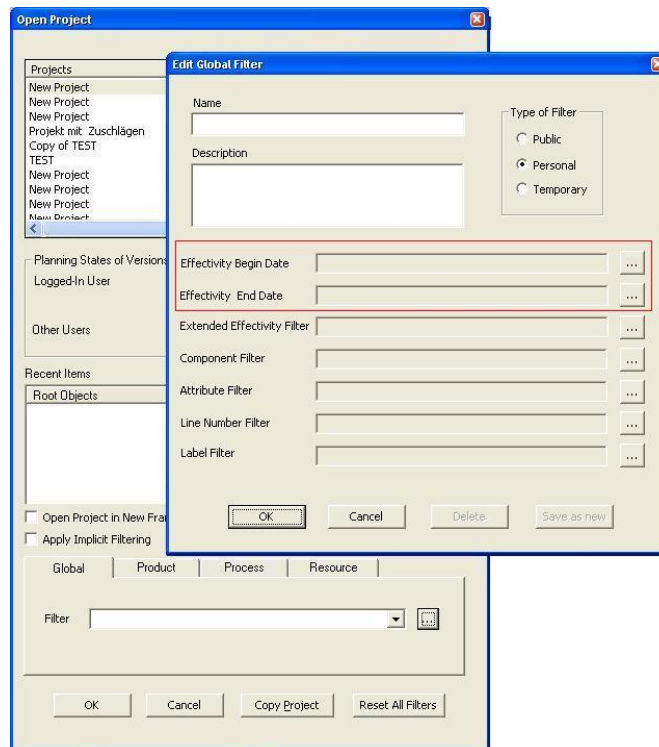


Figure 87: Using the Effectivity Filter as Filter – Opening Projects

- 2) Click  button next to **Effectivity Begin/End Date**. The **Effectivity** dialog appears.

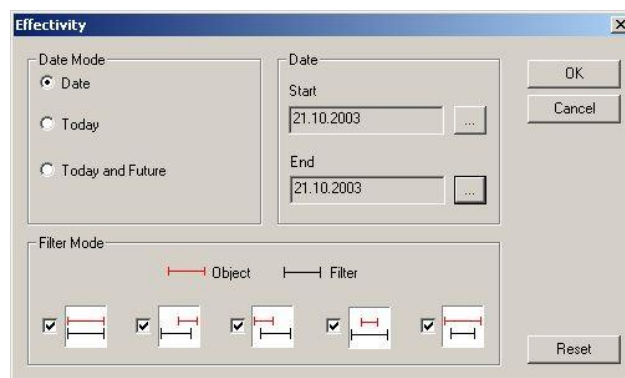


Figure 88: Dialog for Setting Temporal Effectivity

- 3) You can select any date for the start and end of the temporal effectivity via the **Date**: for example, you could set the start in past and the end in the future.
 - **Using Today:** The current date is set using *Today*.
 - **Today and Future:** The current date plus a date in the future (which you define) is set using **Today and future**.

Current Date
21.10.2003

- 4) You can vary the display of the filtered objects using the filter mode. You must enable **Filter mode** and **Date mode** so they are active at the same time. In order to set the filter, at least one filter mode must be enabled for the temporal validity range.
- 5) The date for **start and end** can be set via the calendar, or you can enter the date directly with **current date**.
- 6) In order to enable one of the three options for the date, click respective field under date mode. *Please refer to the [Figure 89](#).*
 - If the field **Date** is enabled: you can set a date for **Start** and **End**.
 - If the field **Today** is enabled: you can **not** set a date.
 - If the field **Today and future** is enabled: You can set a date only for **End**.



Figure 89: Selecting the Date via Calendar

- 7) Confirm the entries with **OK**.

9.9.2 Enabling Filter Mode

The possible filter modes are displayed in a schema in which the red bar stands for the object for which the effectivity is set. The black bar stands for the effectivity range in which the set dates for the objects are valid. Depending on the enabled filter mode, the objects are displayed filtered after a project is opened.

The Process Engineer distinguishes between five possible cases of filtering for the filter mode. With the filter mode it is possible to expand or limit assigned dates for objects. The filter mode can be used only if dates are specified.

Objects are displayed filtered if they correspond to the set filter 100%.



Note

You must always enable one of the five filter modes to set the effectivity filter.

- 1) You can set a filter mode by checking the corresponding field.
- 2) The set date range is reset with the button **Reset**. In filter mode, all five options are then enabled.



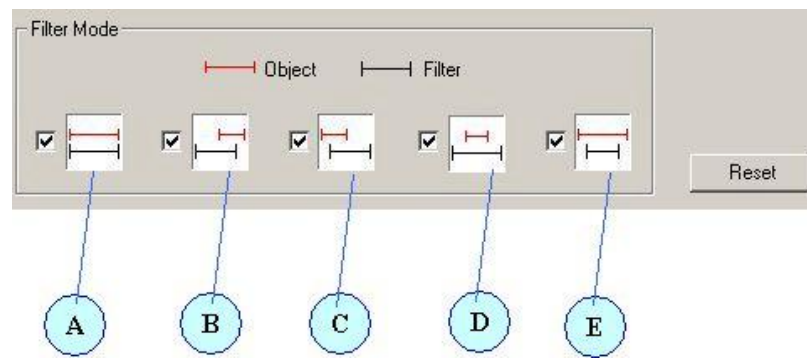


Figure 90: Enabling the Filter Mode Dialog

9.9.3 Using Filter Modes

You can set one filter mode or combine several with one another. Objects for which no filter has been set are as a rule always displayed unless an object on a higher hierarchical level does not correspond to the set filter. *Please refer to the Figure 90.*

Filter Mode – all Enabled

If all options for filter mode are enabled, all objects which fall within the set date range are displayed filtered: for example, if only the start date of an object lies within the effectivity range, this object is displayed since it would correspond to **case B** in filter mode, etc.

Setting Filter Mode – Case A

If you enable only this filter mode, only the objects for which the start and end dates of the objects correspond precisely to the start and end dates of the filter time period are displayed.

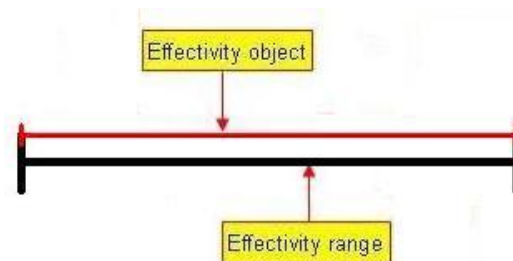


Figure 91: Filter Mode – according to Case A

Setting Filter Mode – Case B

If you enable only this filter mode, only the objects whose start date falls within the filter period are displayed; the end date must always be after the end date of the filter period.

Two limiting cases must be taken into consideration:

- Objects are also displayed if the start date of an object corresponds to either the start or end date of the filter period.

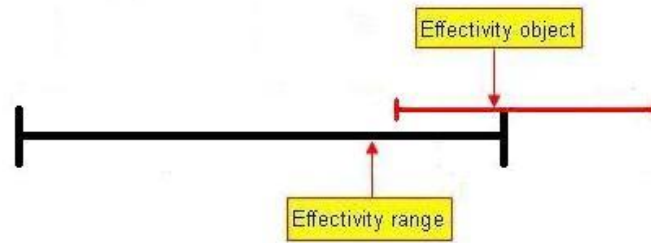


Figure 92: Filter Mode – Case B

Setting Filter Mode – Case C

If you enable only this filter mode, only the objects whose end date falls within the date range are displayed; the start date must always be before the start date of the filter period. The limiting case must be taken into consideration:

- Objects are displayed only if the end date of an object corresponds to either the start or end date of the filter period.

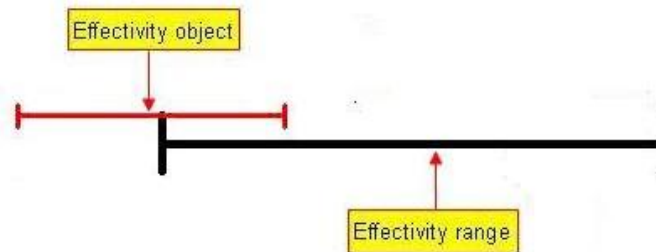


Figure 93: Filter Mode – Case C

Setting Filter Mode – Case D

If you enable only this filter mode, only the objects for which the start and end date falls within the date range are displayed. The limiting case must be taken into consideration:

- Objects are displayed if the start date of an object is the same as the start date of the filter period and if the end date of an object is the same as the end date of the filter period. The objects are not displayed if both the start and end date are the same.

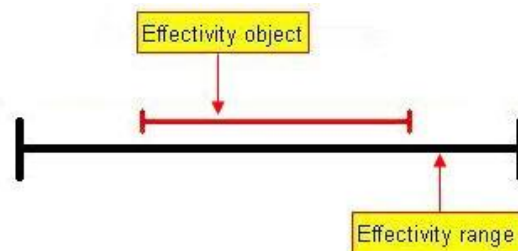


Figure 94: Filter Mode – Case D

Setting Filter Mode – Case E

If you activate only this filter mode, only the objects for which the start and end date falls outside the date range are displayed. The limiting case must be taken into consideration:

- Objects are displayed if the start date of an object is the same as the start date of the filter period and if the end date of an object is the same as the end date of the filter period. The objects are not displayed if both the start and end date are the same.

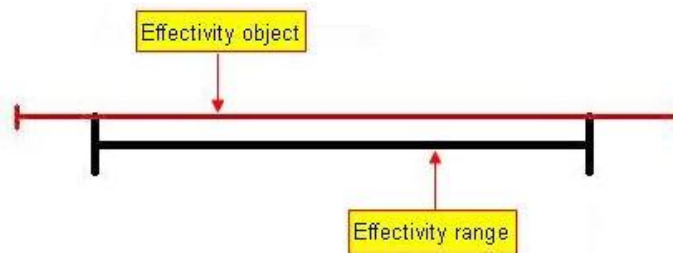


Figure 95: Filter Mode – Case E

9.10 Introduction to Extended Effectivity Filters

Product data are generated and managed in product management systems. These product data may contain extended filter conditions which show an allocation to defined manufacturing periods or optional equipment for products - extended filter effectivities (Multiline Effectivity) are, for example, a combination of various date expressions with different assigned code rules.

After importing products to the Process Engineer, objects can be displayed filtered by using the extended effectivity filter corresponding to the filter set.

In principle, you can import product data from any product management system. In order to import product data with extended effectivities, the product management systems must support this extended effectivities, such as those in ENOVIA VPM V4 and V5.

The product data is imported with the program **ENOVIA Engineering Hub to Manufacturing Hub Connection**.



Note

The extended effectivities should not be edited in the Process Engineer; if the Process Engineer is updated, effectivities could be lost when the objects are imported.

When data are imported, product and resource data are given priority. Processes cannot be imported. Processes can be displayed filtered if the processes have been linked via relations to the imported products or resources in the Process Engineer.

9.10.1 Filtering by Extended Effectivities Filter

Extended effectivities are entered into the extended effectivities filter according to a defined syntax. Every filter entry has its own syntax.

You can use the extended filter for:

- Specifying the date
- Line numbers
- Labels
- Code rules



Note

When working with the extended filter, two essential differences must be observed: specification of the effectivity for the object and the specification of the filter in the extended filter according to which the objects are displayed. All objects overlapping with the filter, or for which no validity of a type included in the filter is defined, are displayed.

If a filter is applied to a project, all components in which the validity overlaps the validity of the filter or is identical with the filter are displayed. Objects **without** assigned validity are **always** valid. Objects assigned validity, are limited in their scope of validity.

For example, all objects valid from 01/01 2003 to 31/12/2003 are displayed. With such a filter specification, objects are also displayed if **only** the end date is between 01/01/2003 and 31/12 2003 as well as the objects for which **only** the start date is between 01/01/2003 and 31/12/2003.

You can use various date expressions with additional code rules for entering the filter.

- 1) Open the project dialog. Click  button next to the **Filter**, the **Edit Filter** dialog opens.

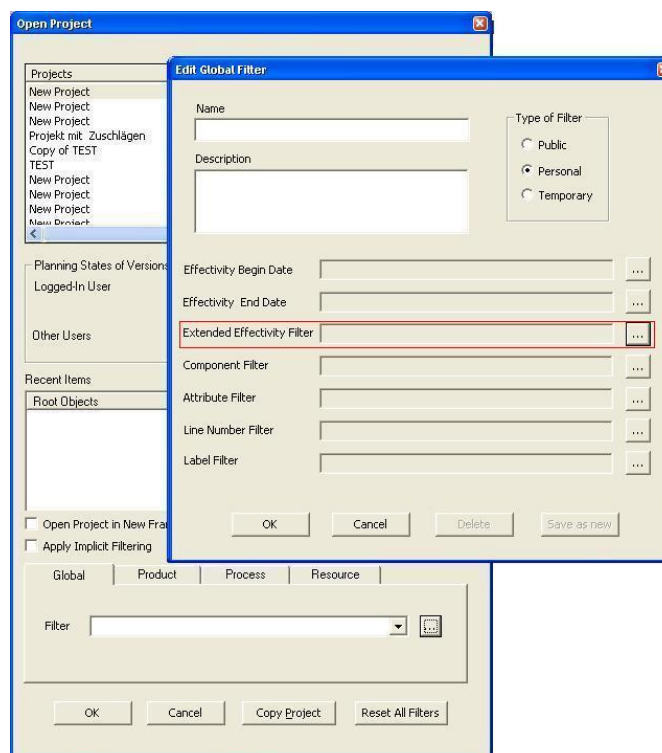


Figure 96: Using the Effectivity Filter as Filter – Opening Projects

- 2) Click  button next to **Extended Effectivity Filter**. The **Filter Settings** dialog appears.

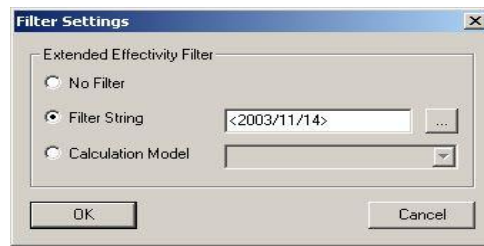


Figure 97: Filter Settings Dialog

In order to display objects as filtered in the project, enter the corresponding filter in the **Filter settings** dialog. The filter specification always corresponds to a fixed syntax. There are two possibilities for the dialog:

- Directly entering the filter according to the selected syntax.
- Selection of a calculation model.

3) In order to enable a filter, click in its respective field. In order to reset a filter, click **No filter** field.

9.10.2 Syntax for the Extended Filter

Extended effectivities can be combined and linked together using to the operators listed in the table. When entering the filter, the operators can be processed by the program according to the priorities listed in the [Table 12](#). **Priority 1** is the highest priority.

- Use the characters of the individual operators for entering the filter.
- The operator STRONGOR has the value of an OR link to a higher priority.
- If the operator STRONGOR is configured as space, you can not use the operator for filter specification.

Table 12: Table for Operators and use of Characters. Syntax for extended effectivities

Priority	Operator	Application - character
1	Not	~
2	STRONGOR	Space
3	AND	&
4	or:	
Internal	Parantheses	()
Internal	End (internal)	;

9.10.2.1 Indicate Namespace for Extended Effectivity

From version PE 5.17 SP2 the syntax for extended effectivities has been extended. Until this version you could only give a range of for example production line numbers, which could be connected with logical operators.

With the new syntax you can indicate a so-called Drop (namespace) in extended effectivities. With help of this namespace you can use and combine different ranges such as production line numbers and dates in extended effectivity, which are also used as project filters. You always indicate extended effectivity filters in properties dialog of a PPR- component.

For notation of extended effectivities you can use ENOVIA- and DPE-Syntax:

Example for Syntax

Drop(R(1-10) AND A)

An extended effectivity with namespace is always introduced by double cross #. With help of the so-called Drop the namespace is indicated by the both filters production line number and label. The definition of the namespace can contain blanks which can be connected with letters or numeric characters. A definition of the namespace with alphanumerical characters is not allowed.

The following filters can be used and combined for extended effectivity with namespace:

- Production line number
- Dates
- Code rules
- Labels

9.10.2.2 Syntax for Filter Entry

For every entry of possible filter specifications, characters according to which the program processes the filter are used. You can check which filter is set for an object in the properties dialog of an object or under the Effectivity tab or in the list view of the selected object. The entry in the extended effectivities filter must always follow the prescribed syntax.

- A date expression always starts and ends in pointed brackets **< >**.
- A Line Number expression starts and ends in cambered brackets **{ }**.
- A Label expression starts and ends in standard brackets **[]**.
- A Code Rule expression starts and ends in double quotation marks **" "** and they are separated by commas. *Please refer to the [Table 13](#).*

Table 13: Characters for Entering Different Filter Ranges

Characters	Syntax for Extended Effectivities
Date Expression	< >
Line Number Expression	{ }
Label Expression	[]
Code list Expression	"Code1, Code2"
Separators between each SA-code	Code, Code2

9.10.2.3 Examples of Filter Specifications: Entering Date Expressions as Filters

The following examples show some of the many possibilities for displaying objects filtered according to a defined syntax in the project.

Dates are always entered with the syntax **year/month/day (YY/MM/DD)**.

Apart from entering the date, the syntax can be extended with plus infinite and minus infinite.

- Syntax minus infinite: minus infinite is entered as **0**

Example

- Syntax plus infinite: plus infinite is entered as *

Here are a few examples and their interpretations.

Date: <2003/07/23> All objects valid on this date are displayed.

Date range: <2003/05/27 – 2003/08/01>

All objects valid between 27/05/2003 and 01/08/2003 are displayed.

Date range with minus infinite: <0 – 2003/05/27>

All objects valid before 27/05/2003 including 27/05/ 2003 are displayed.

Date range with plus infinite: <2003/05/27 - *>

All objects valid after 27/05/2003 including 27/05/2003 are displayed.

Date range with specification as OR link:

If you separate different possible date ranges within a bracket expression by a comma, the program interprets the comma as an OR link.

<2003/05/27 – 2003/08/01, 2004/08/02 – 2004/10/01, 2005/10/02 – 2005/12/31>

With this data range, either all objects are displayed which fall between 27/05/2003 and 01/08/2003 or between 02/08/2004 and 01/10/2004 or 2/10/2005 and 31/12/2005.

You receive the same display if you use several brackets for the expression and connect these individual brackets to the characters for the OR link.

<2003/05/27 – 2003/08/01> | <2004/08/02 – 2004/10/01> | <2005/10/02 – 2005/12/31>

Date range with specification as AND link

<0 – 2003/12/31> & <2002/01/01 , 2003/01/02 - *>

With these date ranges, all objects are displayed that correspond to the date 01/01/2002 and lie between 01/01/2003 and 31/ 12/2003. If an AND link is used, all expressions between the brackets which are linked to an AND must simultaneously apply.

Example

Date range with specification as code lists

The same syntax for the entry in the extended effectivities filter is also used for linked date expressions with Line Numbers or labels. This type of specification involves Multiline Effectivity, which is possible only via the extended filter.

<2003/01/01 – 2003/12/31> & “ ABC“ | <2004/01/01 – 2004/12/31> & “ DEF“

With this combination of date ranges with code rules, which also include various time periods, all objects are displayed which lie between 01/01/2003 and 31/12/2003 or have the code rule ABC or lie between 01/01/2004 – 31/12/2004 or have the code rule DEF. The OR link shows that one of the bracket expressions must be fulfilled with the respective AND link to the code rules. If an object has the validity <2003/01/01 – 2003/12/31> and “DEF”, it cannot be displayed.

9.10.2.4 Examples of Filter Specifications: Entering Line Number as Filters

Expressions for Line Numbers are always set between cambered brackets. It is possible to enter both individual Line Numbers as well as ranges into the extended effectivities filter. A comma within an expression between the cambered brackets is, on the other hand, interpreted as an OR link. The same rules of syntax as those for date expressions apply. The following examples should clarify this.

Line Number with individual specification {25}

With this specification, all objects with the Line Number 25 are displayed.

Line Number with range {9-25}

With this specification, all objects with a Line Number between 9 and 25 are displayed.

Line Number with plus infinite {25 -*}

With this specification, all objects with a Line Number of 25 or greater are displayed.

Line Number combined with ranges {1, 3, 4, 7-23, 45 -*}

With this specification, all objects with a Line Number of 1, 3, 4 or 7 to 23 or 45 or greater than 45 are displayed. Objects with the Line Numbers 2 or 33 are not displayed.

Example**Entering labels as filters**

Expressions for labels are always set between standard brackets. It is possible to enter only individual labels in the extended effectivities filter. A comma within the expression between the brackets separates the individual label specifications and is interpreted as an OR link. The same rules of syntax as those for date expressions apply.

Label with individual specification [L1]

All objects with the label L1 are displayed.

Label as OR link [L1, L2,L3]

All objects with either L1, L2 or L3 as a label are displayed. You receive the same display if you link the individual brackets with the OR character.

[L1] | [L2] | [L3]

9.10.2.5 Examples of Filter Specifications: Entering Code Rules as Filters

Individual code rules should be the exception when filtering, generally you can use code lists.

Expressions for code rules does not require any special form of brackets when entering them, as label specification, for example, necessitates the use of standard brackets. When entering code rules you may only use codes which are defined in the token list in the project library. On the other hand you can use operators in the default configuration, such as OR and AND.

In contrast to code lists, code rules describe groups of product variants. Code lists, on the other hand, fully describe a defined product with all equipment features. The same rules of syntax as those for date expressions apply.

Code rule as OR link**M16 | M18**

With this input, all objects will be display, that either bear the code M16 or M18, and which are not expressly set invalid for M16 and M18.

Example: Just assume you are producing variants to be furnished with air conditioning systems. Additionally you have defined that these variants are never to be combined with a glass roof.

One air conditioning system bears the code **M16**, the other code **M18**. If you defined both codes as filter criteria, all objects would be display, which correspond to just this filter definition, and additionally all parts, such as parts of the standard equipment of the variant, which are not expressly excluded by a code. Upon filtering, parts with an **Exception Code** (not M16,-M18) at the planning object will be excluded, such as the glass roof.

Example Marking code rules with bracket expressions

Parentheses affect the sequence of the evaluation.

Parentheses can be used as in the same way as in school, when algebra first appeared on the schedule; i.e. to mark expressions which are linked within to operators such as AND or OR.

This example shows which characters you can use in linking code rules.

(K05 & M166 | K05 & M668) & ~ ME01 & ~ (M668 & 486)

All objects are displayed which have either K05 & M166 or K05 and M668 and do not correspond to the code rules which **are not** (~) linked.

9.10.2.6 Examples of Filter Specifications: Entering Code Lists as Filters

Using code lists, a certain product is described in its entirety. A code list is comprised of individual codes, which are set with the planning objects. A code list is only used as a filter. The individual codes in the code list are linked by a **logic And**.

Expressions for code lists are always set between two quotation marks. Individual codes within a list are separated by commas. The same rules of syntax as those for date expressions, for example, apply.

Code lists are an abbreviated form, in which all code rules, which are not listed explicitly, are excluded. There are other types of filters, such as production numbers and validity by date; these are not considered when filtering by code lists, and are thus not shown.

Example of a code list specification

"M16,K05,486"

9.10.2.7 Checking Extended Effectivities with Algorithms

If in the context menu of the uppermost node – the **project node** – you open the entry **Extended effectivities**, you receive two options.

The operating mode for calculating and analysing extended effectivities is analogous to that for code rules. For more information refer to the relevant sections in [Working with SA Codes and Code Rules](#).

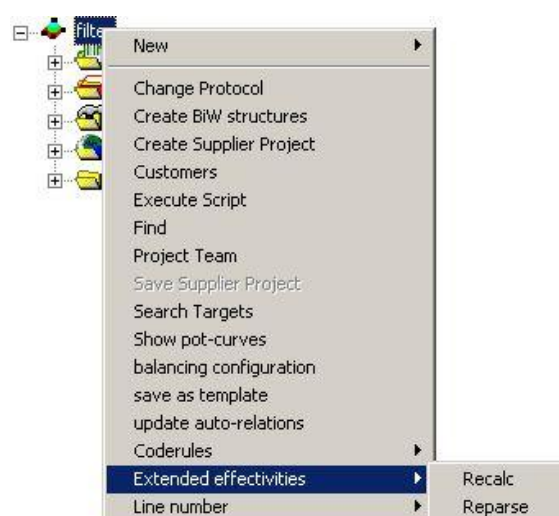


Figure 98: Opening Extended Effectivities – Project Node Context

9.11 Using Implicit Filtering for Displaying Objects

The function **Implicit Filtering** is a method of filtering that can be used in addition to the existing filter mechanisms such as Effectivities filter and Extended effectivities filter.

Implicit Filtering can be used to determine all valid processes for a set effectivities range. Relations of processes to products and resources are checked for their effectivities by means of the function **Implicit Filtering**.

The purpose of this method is to determine precisely which process structure is necessary to manufacture products and to plan processes for resources. The basis for this calculation comprises the effectivities of the PPR components and relations that are checked for this effectivity.

This additional filter method makes it possible to apply the filter mechanism so that only processes, products, and resources that are linked to valid relations and that correspond to the filter settings made when opening a project are displayed. The Implicit Filtering method can be used in two ways:

- For all relations of the relation type nodes.
- For all relations possible between PPR components, such as the relations between processes and products
process_first_processes_product.



Note

In order to keep the most current result after the filter process, either press the function key F5 or open the context menu on the project node and select the menu item Reload.

9.11.1 Applying Implicit Filtering for Projects

You can apply the implicit filtering method for the project in two ways:

- When opening the project.
- In retrospect when the project is open, under the tab **Filter** in the properties dialog of the project.

To Apply Implicit Filtering when Opening the Project

- 1) Select the project that is to be opened and then select **Apply Implicit Filtering**.

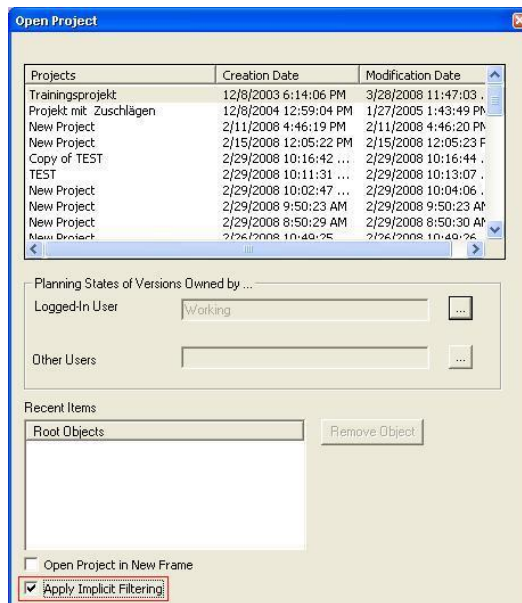


Figure 99: Open Project – select Apply Implicit Filtering
To Activate Implicit Filtering when the Project is Opened

- 1) Open the context menu on the project node.
- 2) Select the menu item **Properties**.
- 3) Select Apply Implicit Filtering under the tab Filter.

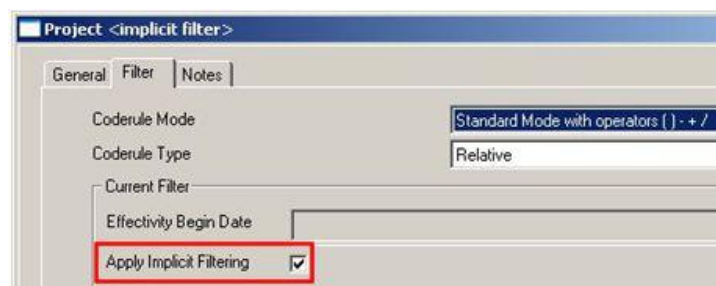


Figure 100: Project Opened – Select Apply Implicit Filtering

9.11.2 Applying Implicit Filtering Method for Processes

The settings for **Implicit Filtering** can as a rule be made for process components. In addition to the existing filter mechanisms (normal filtering) there are two further methods available for Implicit Filtering:

- Sibling Activated
- Link Activated

Methods to be used for a process are set in the properties dialog of a process.

The application of this method is described in the following chapters. *Please refer to the [Using Implicit Filtering for Activate Sibling](#) and [Using Implicit Filtering for Link Activated](#).*

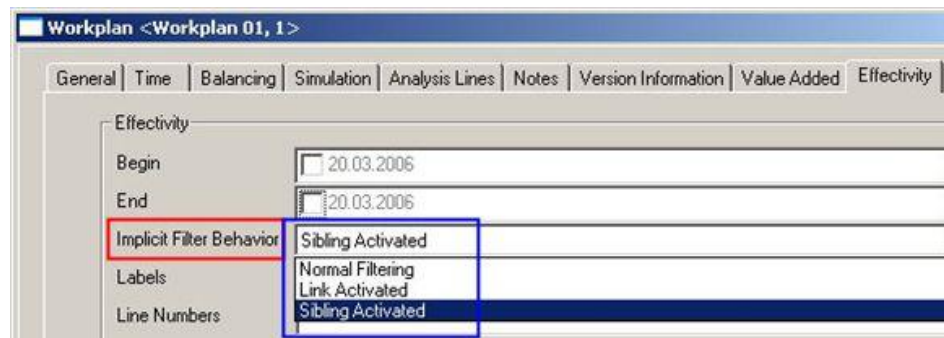


Figure 101: Select Methods for Implicit Filtering

In the standard configuration the selection **Implicit Filtering** is not shown in the properties dialog. The settings for showing it can be made in the configuration tool under the type ergocombase (Ergo Component) for the attribute Implicit Filter Behavior.



For more information, *Please refer to the [Administration Manual](#).*

If you use **Implicit Filtering**, you must activate the attribute **Protect Effectivity** for the process so that effectivities of products or resources can not be inherited by processes. The Implicit Filtering can be used as an alternative mechanism for inheriting effectivities.



For more information on function permissions, *Please refer to the [Administration Manual](#).*

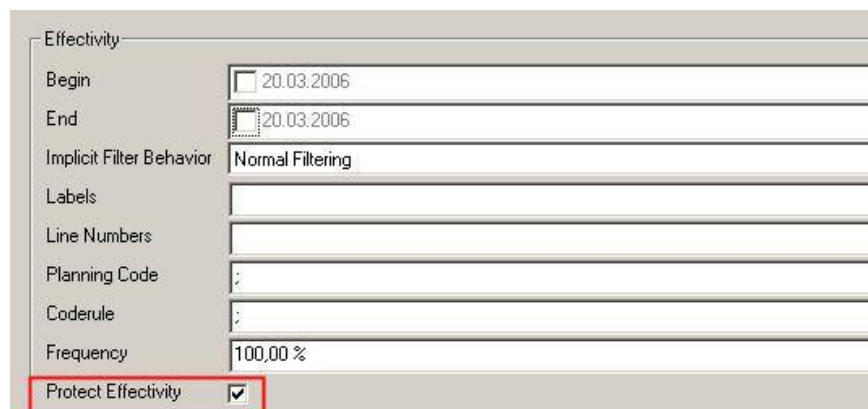


Figure 102: Activate the Attribute Protect Effectivity

9.11.3 Using Implicit Filtering for Activate Sibling

With this method, only the relation type nodes is checked. In order to determine all processes components of a level for a defined effectivities range, you can use the method Activate Sibling.

All relations between hierarchical levels of a structure are shown with by means of the relation type nodes. A hierarchical structure exists on at least two levels. The relation between two levels is created with the relation type nodes.

One can thus say that there is a parent/child relationship between two levels of a hierarchy, and as a result one could also refer to all PPR components that are children of a parent node, i.e. are on the same hierarchical level, as sibling parts.

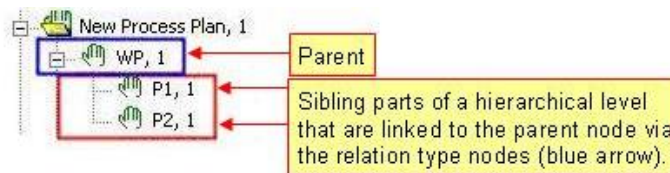


Figure 103: Sibling Parts

9.11.3.1 Mode of Operation for a Filter Process

As previously mentioned, **Implicit Filtering** is a filtering method that can be used in addition to the existing filter methods. The filtering process takes place in several steps: First a check is made to determine whether a further effectiveness filter is set; if one is set, these effectiveness must be fulfilled. In the next step the filter methods of the **Implicit Filtering** are checked; these then ultimately determine which components are displayed.

These steps are always taken and they are independent of whether the method **Sibling Activated** or **Link Activated** are applied for **Implicit Filtering**.

When executing the **Implicit Filterings** for the Method **Sibling Activated**, a check is made to determine whether there are process components marked with the method **Sibling Activated** on the open structure level for the relation type nodes. In the next step siblings availability is checked. Only process components not marked with the method **Sibling Activated** can be recognized as siblings. Only if such marked process components are available is the filter method fulfilled and the process components are displayed.

When filtering with the method **Sibling Activated**, two states which must be fulfilled are checked for the **Implicit Filtering**: at least two processes must be available on one level and one process must not be marked with the method **Sibling Activated**. Only under these conditions is a process recognized as a sibling. The procedure is clarified in the following examples.

Example

Example One – Activate Sibling

In the project filter set in this example only process **P1** can be displayed.

Initial Prerequisites

- No effectiveness are set for the parent node and for the higher hierarchical levels.
- Effectivities for process **P1** = Implicit Filter Behavior - Method Normal Filtering selected, extended effectivity = R(1-10).
- Effectivities for process **P2** = Implicit Filter Behavior - Method Sibling Activated selected, extended effectivity = R(5-20).
- Set project filter - Apply Implicit Filtering is selected, set filter **R(1)**.



Figure 104: Set Filter for Project – Example 1

Result

The result is, as expected, process structure **WP** is displayed with process **P1**.

The reason for this is that only the process (**P1**) fulfills the set effectivities filter R(1) for the project. Process P2 does not already fulfill the set effectivities filter and for this reason it is not displayed. A further check with the method *Sibling Activated* is no longer necessary.

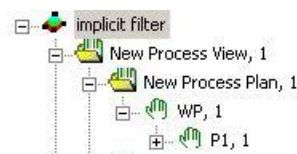


Figure 105: Result of Example 1 – Sibling Activated

Example

Example Two – Activate Sibling

Both processes P1 and P2 are displayed for the set project filter in this example.

Initial Prerequisites

- No effectivities are set for the parent node and for the higher hierarchical levels.
- Effectivities for process **P1** = Implicit Filter Behavior - method Normal Filtering selected, extended effectivity = R(1-10).
- Effectivities for process **P2** = Implicit Filter Behavior – method Sibling Activated selected, extended effectivity = R(5-20).
- Set project filter - Apply Implicit Filtering is selected, set filter **R(6)**.



Figure 106: Set Filter for Project – Example 2

Result

The result is, as expected, that process structure **WP** is displayed with both processes **P1** and **P2**.

The reason for this is that both processes fulfill the set effectivities filter R(6) for the project. In addition, the method **Sibling Activated** is fulfilled, since process **P1** is marked with the method **Normal Filtering**. The result would look different if both processes, **P1** and **P2**, were marked with the method **Sibling Activated**. See also the third example.

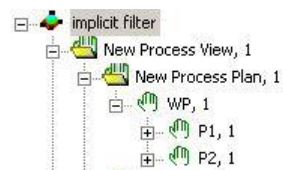


Figure 107: Result of Example 2 – Sibling Activated

Example

Example Three – Activate Sibling

Only the parent node **WP** displayed for the project filter is set in this example.

Initial Prerequisites

- No effectivities are set for the parent node and for the higher hierarchical levels.
- Effectivities for process **P1** = Implicit Filter Behavior - method Normal Filtering selected, extended effectivity = R(1-10).
- Effectivities for process **P2** = Implicit Filter Behavior - Method Sibling Activated selected, extended effectivity = R(5-20).
- Set project filter - Apply Implicit Filtering is selected, set filter **R(20)**.

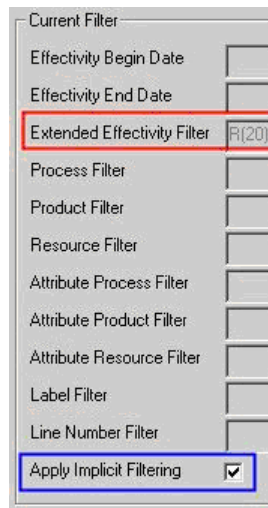


Figure 108: Set Filter for Project – Example 3

Result

The result is, as expected, that only the process structure **WP** is displayed.

The reason for this is that process **P1** **does not** fulfill the set effectivities filter for the project. Process **P2** fulfills this effectivities filter but it is **not** displayed because of the *Implicit Filtering*, since no further process is available on this level which, for example, is marked with the method *Normal Filtering*. Thus no sibling exists, which would be a condition for process **P2** to be displayed.



Figure 109: Result of Example 3 – Sibling Activated

Example Four – Activate Sibling

Only the parent node **WP** displayed for the project filter is set in this example.

Example

Initial Prerequisites

- No effectivities are set for the parent node and for the higher hierarchical levels.
- Effectivities for process **P1** = Implicit Filter Behavior - method Sibling Activated selected, extended effectivity = R(1-10).
- Effectivities for process **P2** = Implicit Filter Behavior - method Sibling Activated selected, extended effectivity = R(5-20).
- Set project filter - Apply Implicit Filtering is selected, set filter **R(6)**.

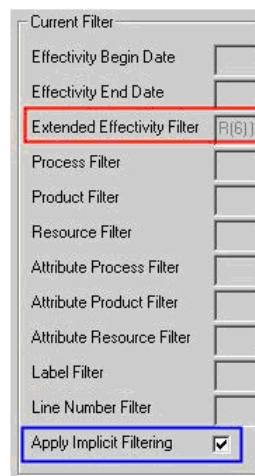


Figure 110: Set Filter for Project – Example 4

Result

The result is, as expected, that only the process structure **WP** is displayed.

The reason for this is that neither of the processes is displayed even though they both fulfill the set effectivities filter. Because both processes are marked with the method **Sibling Activated** and no further processes exist on this level which, for example, are marked with the method **Normal Filtering**. Both of these processes are therefore **not** displayed because of the **Implicit Filtering**.

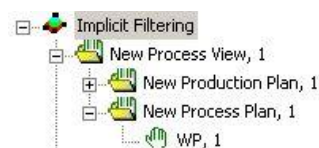


Figure 111: Result of Example 4 – Sibling Activated

9.11.4 Using Implicit Filtering for Link Activated

With this method it is possible to check all relation types that exist between processes and products or resources. A prerequisite for checking according to the **Link Activated** method is that the relation types in the configuration are marked.

You can configure the relation type for types (as shown in the figure) and for plantypes.



For more information on function configuration, *Please refer to the [Administration Manual](#).*

- The mark must be set individually for every relation type in the configuration – such as for relation type **process_first_processes_product**.
- In order to mark a relation type for the method **Link Activated**, set **Yes** for the relation type for the attribute **Consider for Activation by Link**.

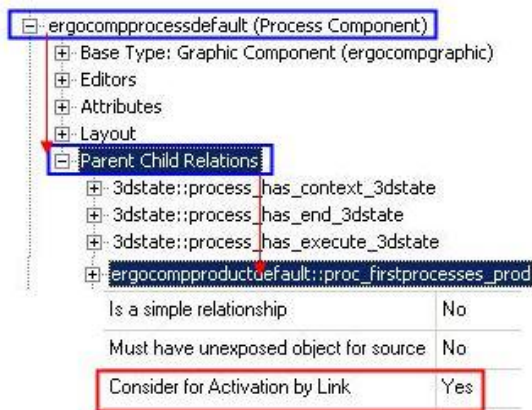


Figure 112: Example: Attribute for Apply Implicit Filtering

**Note**

A link can be made in both directions between processes and products or resources by means of drag and drop in the PPR-Navigator. For the Implicit Filtering the attribute Consider for Activation by Link for the relation type may be marked only in one direction either under the type product or under the type process. The formation of loops by Implicit Filtering while checking is to be avoided. Therefore you should ensure that the attribute for the relation type is activated in only one direction at all times.

9.11.4.1 Mode of Operation – Method Link Activated

As previously mentioned, **Implicit Filtering** is a filter method that can be used in addition to the existing filter methods.

If other filter defaults are specified for the project, they must be fulfilled. If they are fulfilled, the valid relations are filtered out by means of the **Link Activated** method and the valid processes are ascertained according to this filter process. This method ensures that after filtering all processes are ascertained that correspond to the set effectivities filter in the project. *Please refer to the [Mode of Operation for a Filter Process](#).*

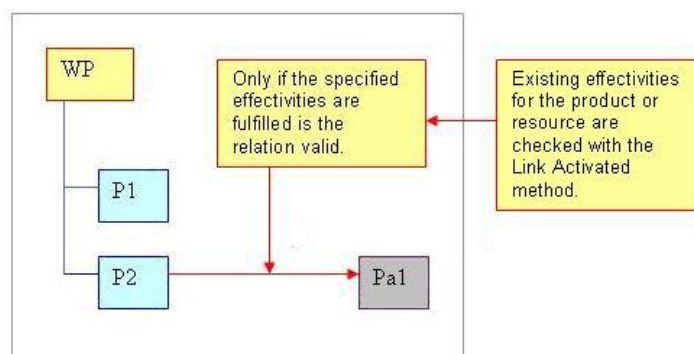


Figure 113: Scheme – Check Effectivities for relation

Existing relations from process to products or resources are checked for their effectivity in the execution of the **Implicit Filterings** for the method **Link Activated**. If these relations are valid, the processes and linked products or resource are displayed.

A relation is valid if the effectivities data for products and resources that are linked to the process correspond to the effectivities filter set for the project. The procedure is clarified in the following examples.



Note

Relations can also have an effectivity. If an effectivity is set for relations, this effectivity is checked; linked products and resources are displayed only if this effectivity is valid.



Note

The "Link Activated (If Children Exist)" filtering mode does not filter an object out if the object has no children. However, if children exist but all of them are not visible for the given filter criteria, the object is filtered out in accordance with the Link Activated implicit filtering rules.

Example

Example One – Link Activated

Both processes P1 and P2 are displayed for the set project filter in this example.

Initial Prerequisites

- No effectivities are set for the parent node and for the higher hierarchical levels.
- Effectivities for process **P1** = Implicit Filter Behavior - method Normal Filtering selected, extended effectivity = R(1-10).
- Effectivities for process **P2** = Implicit Filter Behavior - Method Link Activated selected, extended effectivity = R(5-20).
- Effectivities of product **K2** = link to process P2 via the relation type **process_first_processes_product**, extended effectivity = **Code 1**.

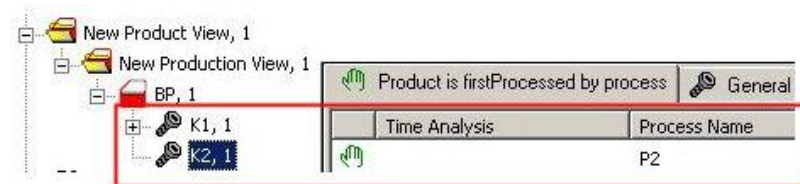


Figure 114: Time Analysis

- Set project filter - Apply Implicit Filtering is selected, set filter **R(6)** & “**Code 1**”.

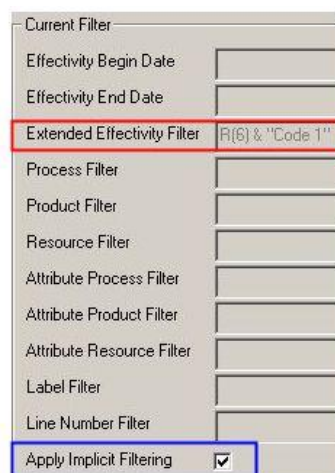


Figure 115: Filter Set for Project – Example 1 Link Activated

Result

The result is, as expected, that process structure **WP** is displayed with both processes **P1** and **P2**.

The reason for this is that both processes P1 and P2 fulfill the effectivities filter **R(6)** set for the project. Since the relation between process P2 and product **K2** is also valid, Code1 for product K2 corresponds to the set effectivities filter “Code 1”, i.e. the relation is valid, and thus **process 2** is also displayed.

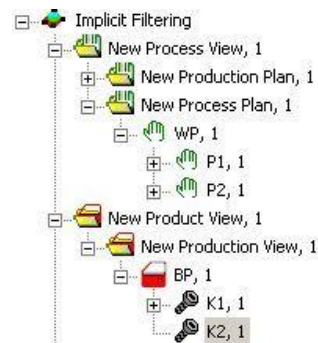


Figure 116: Result of Example 1 – Link Activated

Example

Example Two – Link Activated

In the project filter set in this example only process P1 is displayed.

Initial Prerequisites

- No effectivities are set for the parent node and for the higher hierarchical levels.
- Effectivities for process **P1** = Implicit Filter Behavior - method Normal Filtering selected, extended effectivity = R(1-10)
- Effectivities for process **P2** = Implicit Filter Behavior - Method Link Activated selected, extended effectivity = R(5-20).
- Effectivities of product **K2** = link to process P2 via the relation type **process_first_processes_product**, extended effectivity = **Code 1**.



Figure 117: Time Analysis

- Set project filter - Apply Implicit Filtering is selected, set filter **R(6)** & “Code 2”.

Figure 118: Filter Set for Project – Example 2 Link Activated

Result

The result is, as expected, process structure **WP** is displayed with process **P1**.

The reason for this is that both processes **P1** and **P2** fulfill the effectivities filter set for the project **R(6)**, but product **K2** does not fulfill the set effectivities filter **"Code 2"** and is therefore not displayed. Process **P2** is not displayed since it is linked to product **K2** via the relation and the method *Link Activated* is selected.

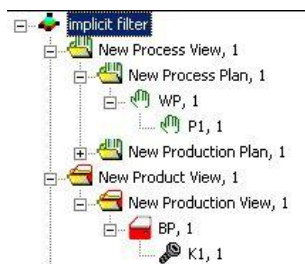


Figure 119: Result of Example 2 – Link Activated

9.11.4.2 Example Three – Link Activated

Example

Only the process structure of the parent node **WP** is displayed for the project filter set in this example.

Initial Prerequisites

- No effectivities are set for the parent node and for the higher hierarchical levels.
- Effectivities for process **P1** = Implicit Filter Behavior - method Normal Filtering selected, extended effectivity = **R(1-10)**
- Effectivities for process **P2** = Implicit Filter Behavior - Method Link Activated selected, extended effectivity = **R(5-20)**.
- Effectivities of product **K2** = link to process **P2** via the relation type **process_first_processes_product**, extended effectivity = **Code 1**.

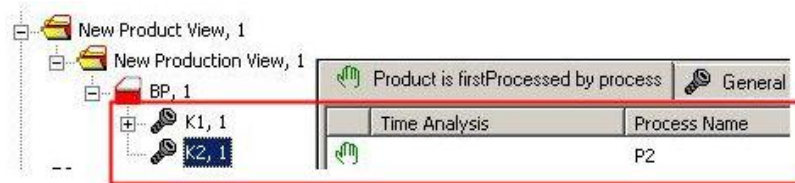


Figure 120: Time Analysis

- Set project filter - Apply Implicit Filtering is selected, set filter **R(11)** & **“Code 2”**.

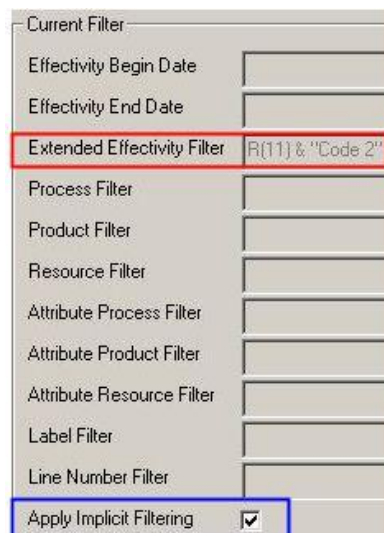


Figure 121: Filter Set for Project – Example 3 Link Activated

Result

The result is, as expected, that the process structure is displayed only with the parent node **WP**.

The reason for this is that process **P1** does not fulfill to the effectivities filter set for the project **R(11)**, and is therefore not displayed.

Process **P2** fulfills the set effectivities filter of **R(11)**, but since the method **Link Activated** is selected for this process and product **K2** does not fulfill the et effectivities filter “Code 2”, the relation is invalid. For this reason process **P2** is not displayed.

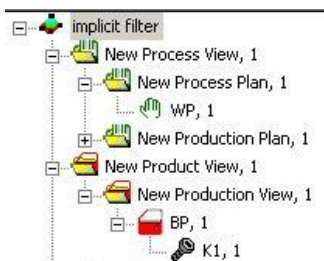


Figure 122: Result of Example 3 – Link Activated

Example

Example Four – Both Methods are Activated

The process structure is displayed with both processes final assembly and cleaning in the project filter set in this example.

Initial Prerequisites

- No effectivities are set for the parent node and for the higher hierarchical levels.

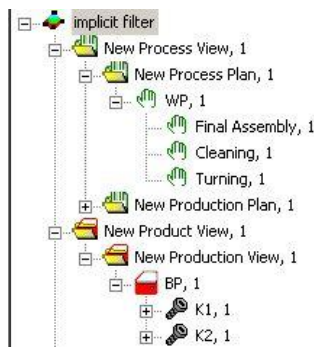


Figure 123: Initial Situation before Filtering

- Effectivities for process **Final Assembly** = Implicit Filter Behavior - method Link Activated selected, extended effectivity = R(5-20).
- Effectivities for process **Cleaning** = Implicit Filter Behavior - method Sibling Activated selected.
- Effectivities for process **Turning** = Implicit Filter Behavior - method Link Activated selected, extended effectivity = R(5-20).
- Effectivities of product **K1** = link to process Turning via the relation type **process_first_processes_product**, extended effectivity = **Code 2**.
- Effectivities product **K2** = link to process Final Assembly via the relation type **process_first_processes_product**, extended effectivity = **Code 1**.

Process Name	Implicit Filter Behavior	Extended Effectivity
Turning	Link Activated	R(5-20)
Final Assembly	Link Activated	R(5-20)

Figure 124: Relations of Products to Processes

- Set project filter - Apply Implicit Filtering is selected, set filter **R(5)** & “**Code 1**”.

Figure 125: Filter Set for the Project – in Example 3 both Methods are Activated

Result

The result is, as expected, that the process structure is displayed with both processes **Final Assembly** and **Cleaning**.

The reason for this is that the process **Turning** fulfills the effectivities filter set for the project **R(5)**, but it is not displayed because of the invalid relations to product **K1**. Product **K1** does not fulfill the set effectivities filter **Code 1**.

The processes **Final Assembly** and **Cleaning** both fulfill the set effectivities filter of **R(5)**. In addition, the relation between the process **Final Assembly** and **product K2** is valid, since the product **K2** fulfills the set filter **Code 1**. And thus the condition **Sibling Activated** for the process **Cleaning** is also fulfilled.

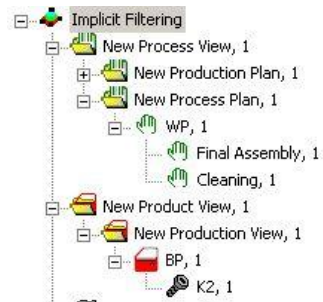


Figure 126: Result of Example 4 – both Methods are Activated

10. Using Targets

Targets are set at the beginning of each project.

Targets are defined in the PPR Navigator in the project library. Project targets may be assigned according to the following criteria.

- Time
- Investment
- Area

You can define your own target criteria for each project in addition to the three criteria mentioned. For this purpose, the appropriate dialog provides you with the **Value 4** and **Value 5** fields.



For more information, *Please refer to the* [Administration Manual](#).

Targets are exclusively created for organizational objects, such as a manufacturing area or a measurement area.

The targets allow you to define overall targets for multiple sectors and to distribute responsibilities accordingly, such as the assignment of a team with cross-sector tasks. This allows you to set targets for multiple company organizations and to assign tasks to teams according to cross-sectional functions.



Note

The target inputs support the distribution of targets to simple organizational structures in the same way as target splitting to corporate organizations and cross-sectional functions.



This chapter explain the targets using the second case (investment) of application as an example. All other procedures can be easily derived from this. The target inputs can be explained by way of an example.

Example

Initial Situation

There are several different departments within an organization:

Coating Department

Manufacturing Department

Organization

Two planning teams are formed for a project called “Temperature Sensor Planning.”

The planning teams are differentiated by the following allocation of duties.

Example

Pre-assembly planning

- (Employees from the Coating Department
- Employees from the Manufacturing Department

Cross-sectional organization

Final Assembly Planning

- (Employees from the Manufacturing Department)

The plan proposes to undertake the coating of a housing and the installation of clamp type sockets on the housing in one production step. The coating, feeding, and securing of the clamp type sockets should be done simultaneously in an automatic machine.

The employees from the coating and manufacturing departments must work together in this case.

The total target investment is 150,000 Euros.

Company management distributes the target to the planning team and departments equally.

In this way, in addition to the planning team managers, the department heads are also responsible for complying with overall target inputs.

Table 14: Splitting of Overall Target

Investment Target Coating Department (euro)		Manufacturing Department (euro)	Total (euro)
Planning Pre-installation	70.000	30.000	100.000
Planning Final installation		50.000	50.000
Total	70.000	80.000	150.000

Since planning teams are only assembled for the duration of the project and the team members usually work on other projects at the same, it does not make sense for the organization to adapt the company organizational chart to a temporary project team structure. This makes the determination of targets for the project even more complicated.

10.1 Assigning Targets

The basic prerequisite in assigning targets is the structure of your project, i.e. the availability of organizational structural elements. Additional entries in the structure element tree are required for using the target functionality.

The method of approach is presented by way of example. For this example you need two organizational structures in the resource view.

To Assign Targets

- 1) Create a resource structure element. Underneath the element are the organizational structure elements (in the example, for the departments and planning teams). The following must be observed.

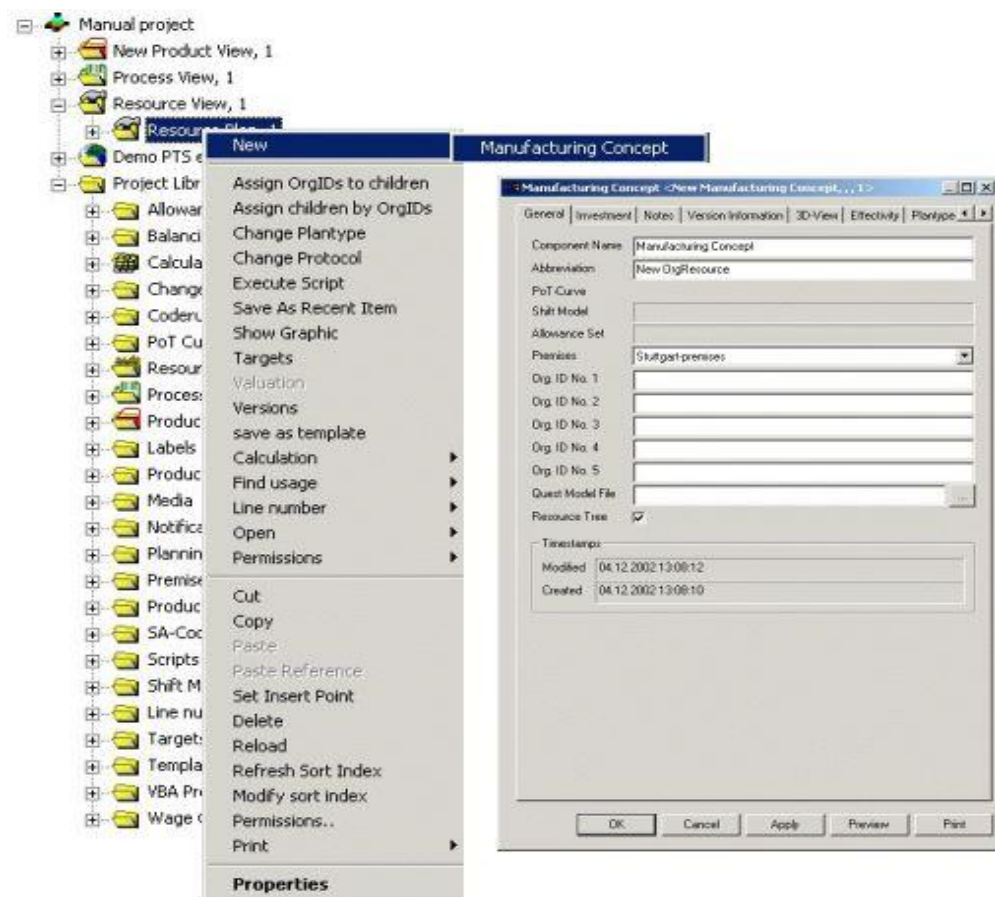


Figure 127: Creation of a Resource Structure with Properties Dialog

- 2) Click **General** tab in the **Properties** window. Here you can assign one or several ORG ID's. The organizational identification number (Org. ID) uniquely identifies the resource structure item. Only one Org. ID can be assigned to each resource structure item. To enter an Org. ID, you can use any of the Org. ID 1 to Org. ID 5 fields.



Note

*You must assign an Org. ID to different organizational numbers in the properties dialog of a resource structure item in order to be able to create common targets for the cross-sectional function between different production areas. To define targets, each target dialog allows you to assign only one **Org. ID** to each **Org. ID No.** for example, you can create shared targets from multiple Org. ID numbers, such as from **Org. ID 1** and **Org. ID 2**, and **Org. ID 2**.*

Example

You assign a common investment target to the production areas **Org. ID 1 FB-production**, and **Org. ID2 final assembly**. This shared target is achieved because when defining the investment target, the entries for **Org. ID 1** and **Org. ID 2** have been marked with the corresponding labels – in our example the letters **F** for production (**F**ertigung) and **E** for final assembly (**E**ndmontage) – in the respective target dialog. These entries allow a clear relationship to be established between the **Investment target** and the required production area which is marked by the respective **Org. ID entry**. Please refer to the [Table 14](#).

Org. ID Significance

- The Org. ID is responsible for a uniquely identifiable assignment of all targets to be assigned. The PPR Navigator needs the Org. ID to clearly identify any organizational structure item.

- The PPR Navigator is able to clearly identify and evaluate the item according to software criteria using the Org. ID.

Figure 128: Example – Each Org. ID Resource can be Assigned only once



Note

The Org ID is also important for importing via the PPR Loader. The PPR Loader can automatically assign read-in data to the structure elements by means of the Org ID.

In the example the Org ID is assigned as follows:

Table 15: Assigning the Org. ID

Org. Element	Org. ID	Character
FB - Manufacturing	Org. ID No. 1	F
FB - Coating	Org. ID No. 1	B
Pre-installation	Org. ID No. 2	V
Final installation	Org. ID No. 2	E

You may also subsequently enter an Org. ID for a resource structure item of an existing structure at any time. Please note, that targets assigned previously might possibly be removed from the respective Targets dialog.

10.2 Creating Targets

The targets for the project are defined in the project library. Unlike previous Process Engineer versions, **version PE 5.11** and higher have default settings for targets, such as the default settings for area, investment and time.

This procedure provides you with a detailed view of individual targets. As a result, production areas, teams, and cross-sectional functions can be assigned in a more flexible way.

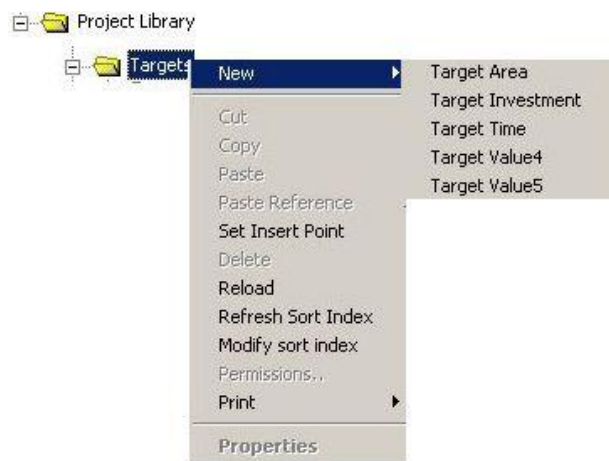


Figure 129: Creating New Targets in the Project Library

10.2.1 Planning Targets

You are provided with three criteria for targets by default:

- **Investment:** The investment input target is used to specify the expected target costs for the planned project. These can be compared in a target/actual comparison at a later date.
- **Time:** The investment input target is used to specify the expected target costs for the planned project.
- **Area:** The area target is used to specify the expected area needed for the planned investment.

- 1) Open the project library in the PPR Navigator.
- 2) Select **Targets** from the project library.
- 3) Open the context menu using right mouse button and choose one of the entries. The properties dialog for targets open. The properties dialog is structured in the same way for all targets. *Please refer to the [Figure 130](#).*

Example - Investment Targets

The procedure could be demonstrated for all three default targets. However, this example was restricted to the investment target.

Example

- 4) Name the investment target in the **Properties** dialog. Be sure to use clear designations: Both designations (name, short description) are displayed in further dialogs and are primarily used for the purpose of easy recognition when identifying the target type.
- 5) Specify the investment sum. You can still correct any value at a later time.
- 6) For organizational numbers (Org. ID numbers) you must now enter the Org. IDs of the organizational areas (production area – coating, preassembly etc.) These entries establish the connection between targets and production area. *Please refer to the [Table 15](#).* In our example, the coating area has the Org. ID **B** (Beschichtung) and the preassembly area has Org. ID **V** (Vormontage).



Note

Each **Org. ID No.** can only be assigned one **Org. ID**. It is necessary for the **Org. IDs** in the properties dialog of a resource structure item to have different **Org. ID numbers** in order to be able to determine a target value for multiple production areas.

Figure 130: Properties Dialog – Investment Targets

7) Confirm the entries with **OK**.

10.3 Editing Target

Targets that have been defined in the properties dialog of a target value can be modified in the **Target Settings** dialog. The dialog itself provides all organizational resource structure items that were generated in the resource structure. These items are displayed according to the assigned **Org. IDs** below the respective **Org. ID Nos.** in a selection list. Changed targets are then also traced in the **Properties** dialog.

Example



Three targets, Investment 1 to 3, have been defined for the investment example. Please refer to the [Table 16](#) and [Figure 131](#).

The editing process for **Target Settings** dialog is always the same. The procedure is shown using the targets for production areas **coating** and **preassembly**.

Table 16: Target Distribution

Investment target	Org. ID 1	Investment (euro)
	Org. ID 2	
FB Coating / Pre-installation	<i>B</i>	70.000
	<i>V</i>	
FB Manufacturing / Pre-installation	<i>F</i>	30.000
	<i>V</i>	

Investment target	Org. ID 1	Investment (euro)
	Org. ID 2	
FB Manufacturing / Final installation	<i>F</i>	50.000

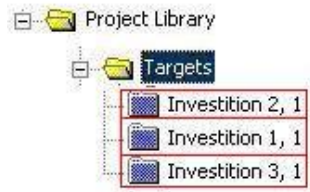


Figure 131: Generated Targets in the Project Library

To Open Target Settings Dialog

The **Target Settings** dialog is opened using the context menu of a generated target.

- 1) Select one of the generated targets from the project library. In our example, a target would be an investment.

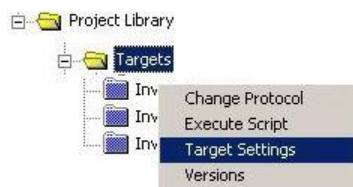


Figure 132: Opening the "Target Settings" Dialog

- 2) Press the right mouse button and select **Target Settings** context menu. After the opening process, you can view the organizational resource structure items (in our example the production areas) that is assigned to a particular target.

Figure 133: Target Settings Dialog for Assigned Production Areas

- 3) You may now change or re-assign the investment sum or production areas.
- 4) The calculation model list box allows you to select the **Calculation Model** to which the target applies.

- 5) Click **OK** to confirm your entries. The **Cancel** button allows you to exit the dialog without saving.

10.3.1 Searching Target Values

The overall target is not usually changed during the course of the whole project. Modifications can only be made between targets of the same type such as the targets for investment, time, and area.

- 1) Select the project node to open the context menu.
- 2) Select **Search Targets** from the context menu.



Figure 134: Opening the Search Targets Dialog

- 3) You can either view individual targets or all targets. To view only specific targets, select the required field. In our example, you can view the investment targets.



Figure 135: Selection – Displayed Targets

- 4) Click **OK** to open the **Project Targets** dialog.

10.3.1.1 Getting Familiar with the Project Targets

After opening the **project targets** dialog, all generated targets are displayed according to the selection that you previously made. You can arrange the column headings in the Targets display area according to your needs. To move a column heading, simply click the respective heading.

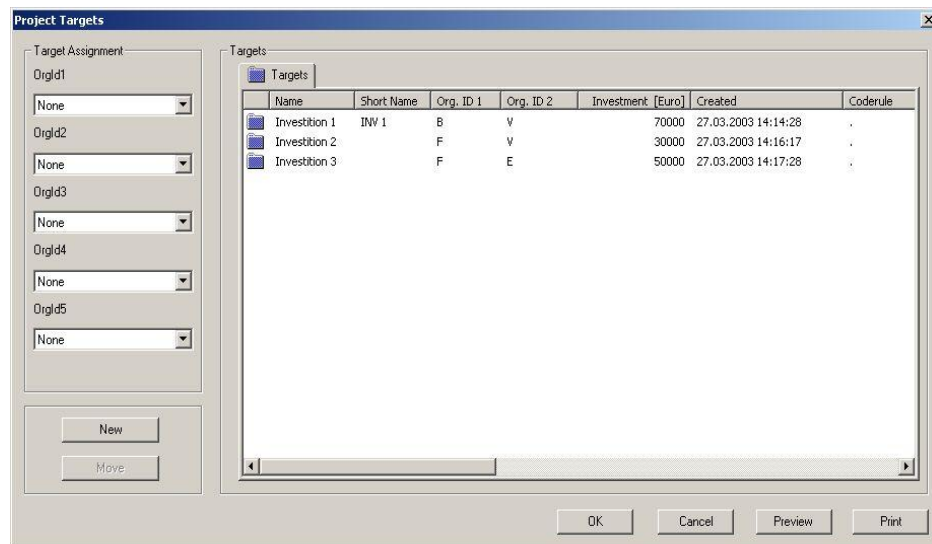
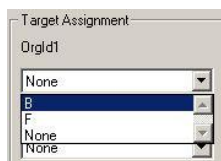


Figure 136: Project Targets Dialog

Editing Process Targets

Project targets can be edited if targets change during the course of a project. For example, you may wish to allocate originally planned investments to different production areas or you may prefer a different assignment of area space. This new assignment can be made in the **Move Target** dialog. Please refer to the [Figure 139](#).



- 1) Setting the display area according to specific targets. The selection window (Org. IDs Target Assignment) displays all assigned organizational areas. The display can be modified by setting a corresponding Org. ID in the selection window.
- 2) The **New** button allows you to generate new targets for each target criterion that has been saved in the project library under targets.
- 3) Make modifications between equal targets via Move button. The **Move** button is only active if two targets have been selected in the display area.
- 4) Press Ctrl key to select the required targets.

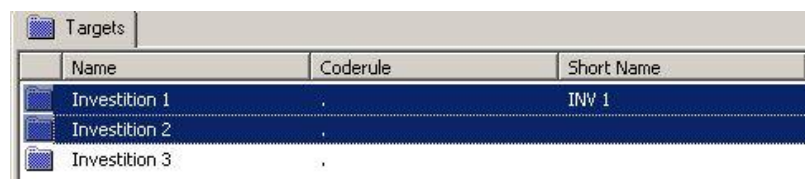


Figure 137: Selecting Targets

The **Move targets** dialog allows you to move values only between two targets of the same type. You can edit only the values according to which you called the dialog, i.e. either according to investment targets (as in the example), area (area values only) or time (time values only).

The two selected targets allow you to move only values that have at least one of these two targets. In our example, **70 000** Euros can be increased at most by **50 000** Euros and **50 000** Euros can be increased at most by **70 000** Euros. The total sum will always be the same. A fundamental modification of values must be made directly in the properties dialog of a target.



- 5) To move a value, just type the value in the required field (1000 in our example). This input determines the value you want to move. *Please refer to the [Figure 139](#).*
- 6) The assignment of values can be made using the two plus buttons. The previously entered value will be assigned to the corresponding target at the point where you press the plus button. *Please refer to the [Figure 139](#).*
- 7) Using the plus sign, you can assign this value as many times as you like until you reach the respective upper limit. If you try to enter a value that is out of the permitted range, a message reminds you of the set limit.



Figure 138: Message: Value out of Range

- 8) Type the required data into the **Description** field for the change protocol. If you do not enter any data, the **OK** button is not active and modified input cannot be saved.

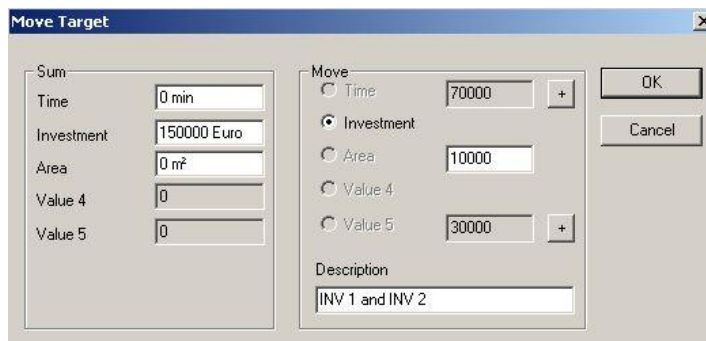


Figure 139: Move Target Dialog

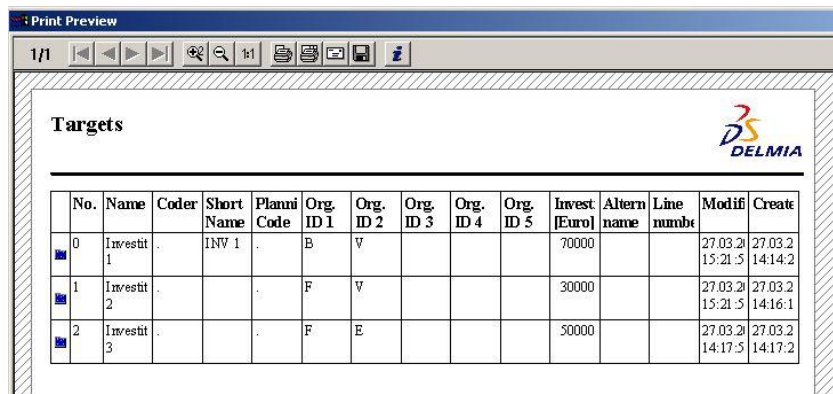
Example

In the example below 70,000 (corresponding to **target investment 1** of the given example) Euros were reduced by 10,000 Euros. As a result, the display has changed accordingly. The two targets **Investment 1** and **Investment 2** now have an investment sum of 60,000 and 40,000 Euros. The new assignment of values (investment) is recorded in the properties dialogs of the respective targets once you have saved your data.



Figure 140: Example – Display for a New Assignment

- 9) The print preview allows you to display the data of the opened targets.
- 10) The **Print** button allows you to print the data of the opened targets. The printout corresponds to the print preview display.



No.	Name	Code	Short Name	Plan Code	Org. ID 1	Org. ID 2	Org. ID 3	Org. ID 4	Org. ID 5	Invest. (Euro)	Altern. name	Line number	Modif	Create
0	Investit 1	.	INV 1	.	B	V				70000			27.03.2015:21:5	27.03.2014:14:2
1	Investit 2	.		.	F	V				30000			27.03.2015:21:5	27.03.2014:16:1
2	Investit 3	.		.	F	E				50000			27.03.2014:17:5	27.03.2014:17:2

Figure 141: Showing Specifically Selected Targets

10.3.2 Tracking Targets

Tracking targets implies comparing target inputs with the planning results over the course of the entire project.

The difference between the target and the actual status is displayed.

In order to compare both states, you need - in addition to the structure that reflects the targets (target structure) - a comparable structure that embodies the actual state.



Note

Printing can generate the "Target-actual comparison" valuation. The print forms can be pre-configured so that they reflect the desired display of results. (See [Printing Manual](#))

For simple project structuring, the target structure can be placed directly opposite the organizational structure in the printout.

Simple project structuring means there is only one organizational structure to which the total target is distributed. (In this case it is not necessary to distribute the target by splitting the targets to organizational structures and cross-sectional functions).

The example shows the set-up of an actual-structure and/or a comparison structure. The comparison structure is designated as the "Investment planning" structure in the example.



Note

The example refers to the Resources view. This procedure can also be applied to the Product or Process View.

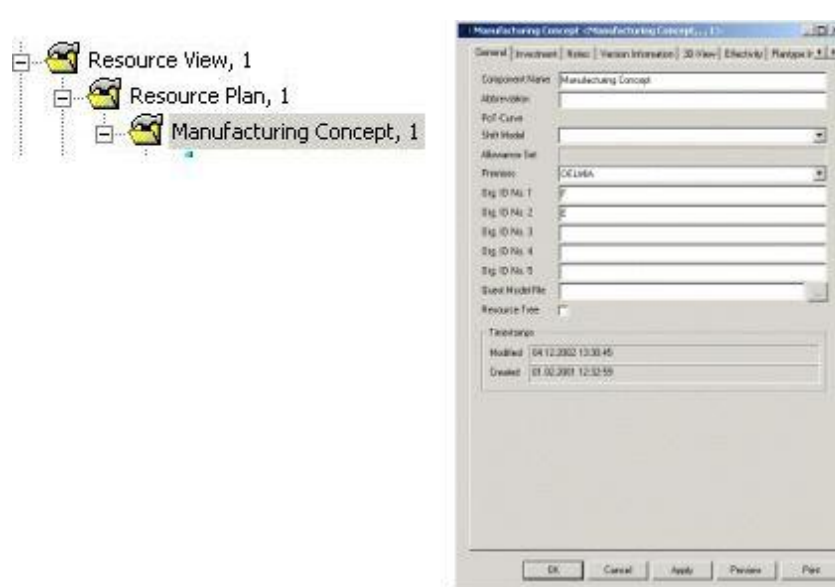


Figure 142: Creating the Comparison Structure for Tracking Targets

When creating the structure, proceed exactly as described in the [Creating a Project Structure](#). Make sure that the Org IDs of the sub-objects match those of the target structure.

The following Org IDs are entered in the example for creating the organizational structure elements or sub-objects in the **Properties** dialog.

Table 17: Org IDs of the Sub-Objects

Sub-Objects of the Investment Planning Structure	Org. ID 1
	Org. ID 2
Invest coating/pre-assembly	B
	V
Invest manufacturing/pre-assembly	F
	V
Invest manufacturing/final assembly	F
	E

You can enter the planned resources opposite the investment target below the structure objects. An estimated, anticipated investment value is entered for the resources during an early stage of planning.

10.3.2.1 Distribution of Expenses

When you need to split the target to several existing parallel structures, as described in the application example, then this chapter proves useful to you.

You have generated a comparison structure and want to compare the target entries according to expenses (planned investments, planned production times). The expenses you enter in the comparison structure are automatically distributed to the organizational structures. The procedure is explained by way of example

Example

A comparison structure is entered for the target structure. Planning objects are assigned in the comparison structure and must be edited by the areas of responsibility.

All objects in the comparison structure are simultaneously distributed to the respective organizational structures.

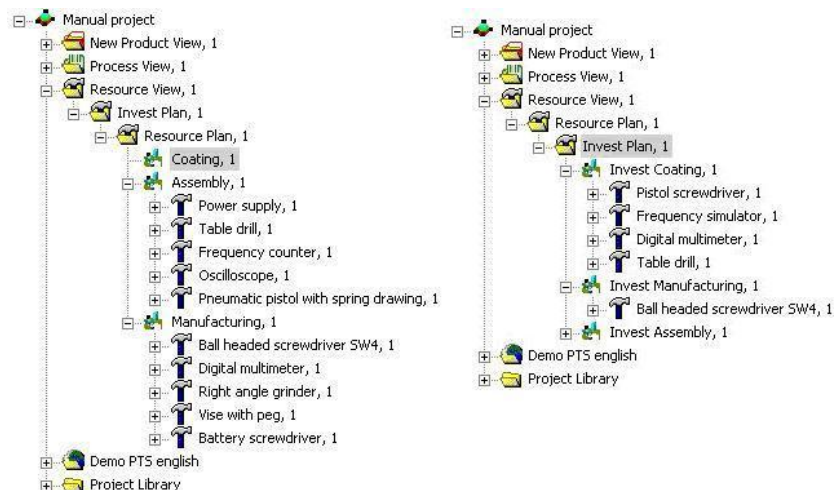


Figure 143: Allocation of Expenses Entered in the Comparison Structure

The entered expenses can be viewed in the Navigator as the initial investment estimates. Estimated values are normally assigned to the expenses during an earlier planning stage. In the example, the planned investments are specified by the team manager and department heads.

The created objects are allocated to the organizational structures based on their Org ID.

10.3.2.2 Detailed Planning in the Resource View

The second step involves de-allocation (detailed planning) within the organizational structures.

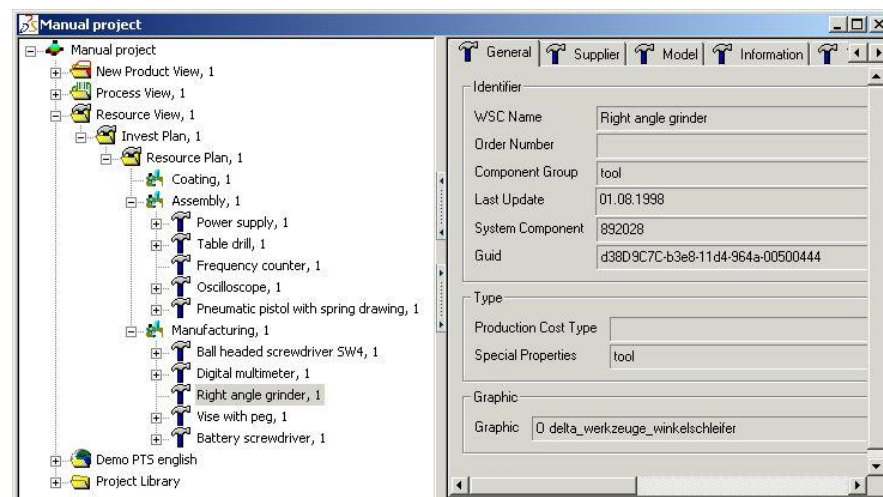


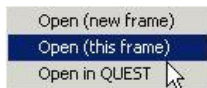
Figure 144: Example of Detailed planning

In the detailed planning, time is determined either by estimated values or by calculated times. The objects allocated to the resource object determine the calculated value; system elements and other resource objects can be allocated to the structure of a resource object.



Note

The “calculated time” entry is updated by assigning a time analysis to the process object in the Process View.



The “calculated time” entry is updated by assigning a time analysis to the process object in the Process View. The assignments are explained in more detail in the manuals “[Graphic Tools](#)” and “[PPR Navigator](#)”.

To Assign predefined System Elements from the Library

- 1) Right-click object.
- 2) Select **Open [this application]** in the context menu. The Resource View opens where graphics can also be edited.

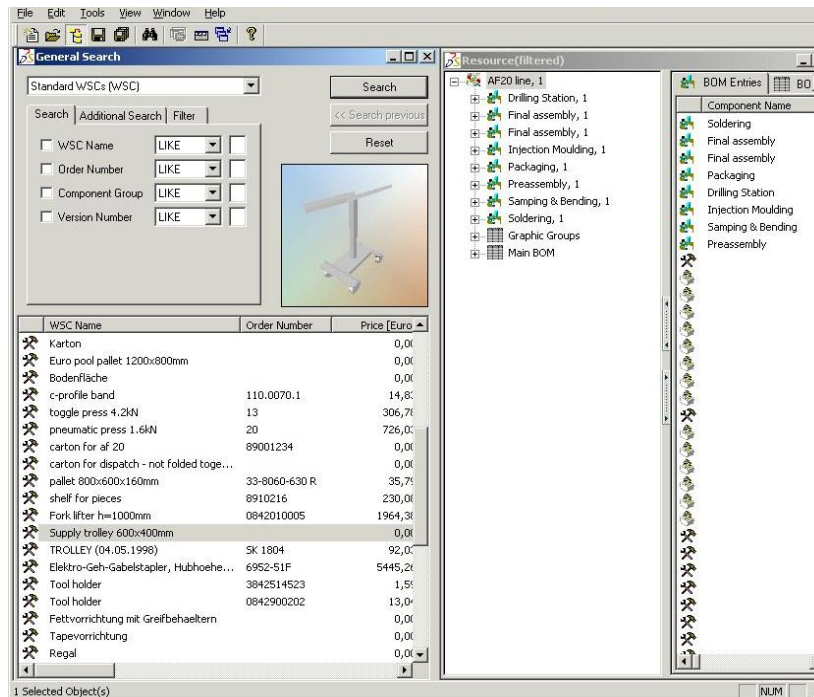


Figure 145: Example of Assigning a System Element to a Resource

- 3) The **Resource** tab is created in the PPR Navigator. Click on the tab. Bill of materials lists are assigned to the resource object in the layout planning. The system elements assigned to the resource are managed in these bill of materials lists.

One way to assign system elements to the resource is to use the Finder (general search). The system element is assigned to the bill of materials list using the drag and drop function.

The system elements are given a price. The cumulative value appears in the PPR Navigator in the “calculated value” field of the resource object. With this allocation, the detailed planning becomes real planning.

10.3.2.3 Detailed Planning in the Process View

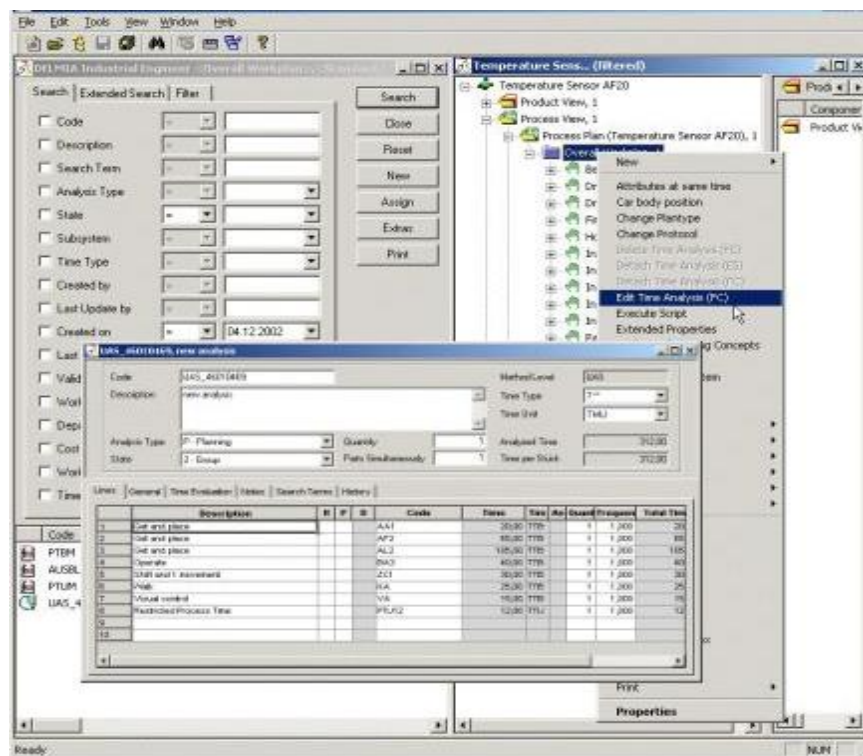


Figure 146: Assigning Time Analyses to Process Objects

- 1) Right-click a process object. Select the **Edit time analysis** entry from the context menu. The **Time Analysis Finder** opens.
- 2) Create a new time analysis using **New** or search the database for an existing time analysis.
- 3) Mark the analysis in the search results window. Click **Assign** button. The time analysis is assigned to the process object.
- 4) Repeated opening of the application using **Edit Time Analysis** opens the assigned analysis.
- 5) The analyzed time corresponds to the calculated time in the PPR Navigator. It is displayed in the properties window of the process object.



Note

An example is given to help you understand how to work with the PPR Navigator. The objective is to structure the project and to add details to the planning content of a previous rough planning phase using the PPR Navigator. Using the additional modules of DELMIA Industrial Engineer, Layout Planning, and Ergonomics, the planning can gradually be refined.

10.4 Introduction to Investment Calculation

In the [PPR Navigator Manual](#) you became familiar with cost analysis and investment calculation. In the Layout module you can proceed in a similar way to calculate the investment needed for the individual system elements.

10.4.1 Investment Calculation

- 1) First do a data backup, so that current values from the database can be used for the investment calculation.
- 2) Click with the right mouse button on the station (final assembly...) and select **Recalc investment** option in the context menu.

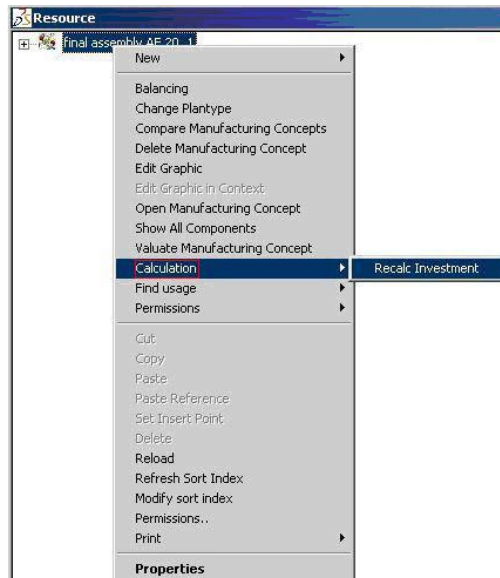


Figure 147: Starting the Investment Calculation

Once the cost calculation is completed, the results of the new calculation of investment can be displayed in two ways.

- 3) Open the **Properties** window for this station. Right-click in the object structure and select **Properties** option. OR

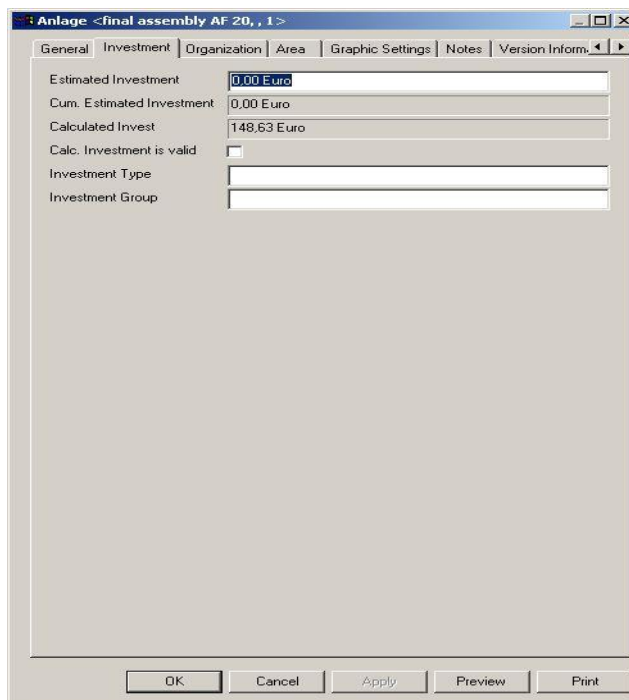


Figure 148: Investment Properties Page

- 4) Click **Investment** tab in the **Properties** menu of the final assembly station.

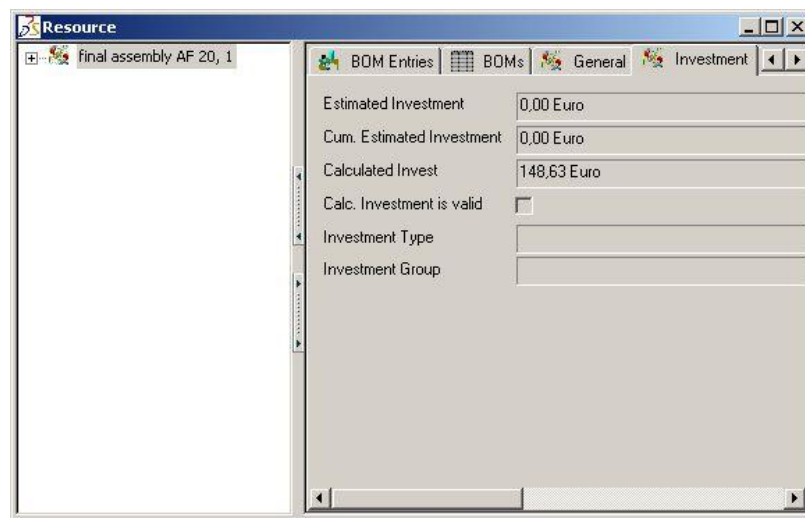


Figure 149: “Investment” Tab in the Display Area

Regardless of which of these two methods you use, the corresponding investment for the operating resources can be seen in the respective windows.

11. Introduction to Planning Status

The planning status defines how you may proceed with the different versions of an object during the planning stage. Thus, each version is assigned a (planning) status.



Note

Every project has the planning status “Editing” as the default.

There are three default planning statuses within the system: Editing, Finished, and Released, with the lowest being “Editing” and the highest “Released”. You can define as many interim statuses as you like for each of these internal statuses. All statuses have a clearly defined order. The order determines which status can be assigned after the other.

In the “Editing” status, all attributes and relations can be freely changed. For the “Finished” and “Released” status, various attributes or relations can be set as not changeable via the configuration. The [Table 18](#) illustrates the differences of the various planning statuses. The object statuses are defined in the example itself.

Table 18: Changeable Attributes/Relations Dependant on Planning Status

Object State (self defining)	Non-changeable Attributes/Relations	Internal State
Working	none	Working
Integrated	Process time / investment resource	Integrate
Integrated and checked	Process time / investment resource	Integrate
Valid	all	Released
Valid and integrated	all	Released

The planning status can either be defined beyond the project in the library or within the project in the project library.

11.1 Creating the Planning Status

There are two possibilities for creating the planning status: beyond the project in the library or within the project in the project library.

To Create a Planning Status beyond the Project in Library

- 1) Call the library via the main menu and open the tree structure under the “Planning Status” node. The three internal-system planning statuses are displayed: Editing, Released and Finished.
- 2) Highlight an entry for which you want to define your own planning status and call the context menu of the entry with a right click of your mouse.
- 3) Select the option **New** and enter the desired properties in the dialog. You now have a self-defined planning status available that is independent of the project.

Figure 150: Creating the Planning Status

This planning status must be made accessible in the project in order to be able to use it in a project. This is done using drag and drop. Drag the created status to the respective entry under the object "Planning Status" in the project library. You cannot assign the status to other objects, as shown in the following error message.

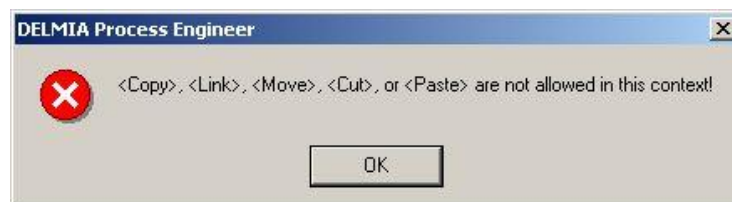


Figure 151: Error Message when Assigning Planning Status

Create a planning status in the project library in the same way as the process described in the library.

To Create a Planning Status within the Project in the Project Library

- 1) Open the tree structure in the project library under the Planning status node. The three internal-system planning statuses of Editing, Released, and Finished are displayed here, too. In addition, the previously self-defined status will also be displayed, if necessary.
- 2) Using the context menu of the relevant entry, generate another entry with the **New** option, which you can then name accordingly. This new status is only available to you within the project.

11.1.1 Changing Priority of the Planning Status

As already mentioned in the theoretical section, planning statuses have a clearly defined priority. This is automatically generated when creating the status. Still, it can be changed. The order is hidden under the **Sort index** property.



Note

The priority of the status can only be changed within one of the internal-system statuses “Editing”, “Finished”, and “Released”. It’s not possible, for example, to set a status from the “Editing” category using a status of the “Release” category.

- 1) Call the properties of a status via its context menu and click **General** page.
- 2) Enter the number in **Sort Index**. The greater the entered number here, the higher the status within the relevant category. By changing the number you can assign a new order to the various statuses.

Integrate State <New Planning State, , 1>

General Notes

Sort Index: 2.00

Name: enabled

Nameshort: FR1

Timestamps

Modified: 03.12.2002 15:06:07

Created: 03.12.2002 15:06:07

OK Cancel Apply Preview Print

Figure 152: Sort Index of the Planning Status

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