SIEMENS

COMOS

Lifecycle
COMOS Material Management Administration

Operating Manual

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

> ⚠ **DANGER**
>
> indicates that death or severe personal injury **will** result if proper precautions are not taken.

> ⚠ **WARNING**
>
> indicates that death or severe personal injury **may** result if proper precautions are not taken.

> ⚠ **CAUTION**
>
> indicates that minor personal injury can result if proper precautions are not taken.

> **NOTICE**
>
> indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

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Table of contents

Preparing the configuration object

<div style="text-align:right; font-size:3em;">1</div>

In the configuration object, you set, among other things, the base objects for working with the "Material Management Assistant" and define conditions for collecting material.

The configuration must exist uniquely per project and be configured so that the "Material Management Assistant" is functional.

See also

Tabs of the configuration object (Page 41)

1.1 Creating the configuration object

Procedure

1. In the "Base objects" tab of the Navigator, navigate to the following node:
   "@30 > M28 > A10 > A10 > A10 Material management configuration"

2. Drag&drop the object below any object in the engineering view.

3. Open the "Process engineering > Pipe Spec Designer" category in the project properties.

4. Drag&drop the configuration object from the engineering view to the "MTO configuration" field.

5. Confirm your entries.

See also

Tabs of the configuration object (Page 41)

1.2 Creating a group folder for documents

You must create a group folder for documents. MTO documents and MRP documents are created here as you work.

Procedure

1. In the "Base objects" tab of the Navigator, navigate to the following node:
   "@20 > A60 > A20 > A10 > A20 Document group"

2. Drag&drop the object below any object in the engineering view.

1.3 Configuring general settings

1.3.1 Configuring folders

You must define the base objects of the folders in order to create MTO and MPR documents and to be able to collect objects.

Base objects are already preconfigured in the database.

Prerequisite

You have created a group folder in the engineering view. See also chapter Creating a group folder for documents (Page 5).

Procedure

1. Open the "Attributes > General" tab in the properties of the configuration object.
   Edit the "Folder" control group.

2. In order to define a base object template for the MTO folders, navigate to the following base object:
   "@30 > M28 > A10 > A30 > A70 Material folder"
   This object is created in the engineering view under pipes and is used to collect the MTO objects.

3. Drag&drop the object to the "Base object for revision folder" field.

4. In order to define the node under which the report templates are located, navigate to the following base object:
   "@30 > M28 > A80 Documents".

5. Drag&drop the object to the "Base object for MTO/PO report templates" field.

6. Navigate to the group folder for documents that you have created in the engineering view. See also chapter Creating a group folder for documents (Page 5).

7. Drag&drop the object to the "Engineering object for MTO/PO documents" field.

8. Navigate to the following base object:
   "@30 > M00 > A90 > A10 Document groups according to IEC 61355"

9. Drag&drop the object to the following fields:
   – "Base object for MTO document packages"
     References the base object template for the MTO document packages. The document packages are created in the group folder for MTO packages and contain all documents of the respective package.
   – "Base object for MPR document packages"
     References the base object template for the MPR document packages. The packages are created in the group folder for MPR packages (see "MTO/PO documents") and contain all documents of the respective package.

1.3.2 Defining units for summation

You must configure the assignment of the units so that the units are displayed and converted correctly.

Procedure

1. Open the "Attributes > General" tab in the properties of the configuration object.
   Edit the "Basic units for summation" control group.

2. Enter the units to be displayed at MTO objects into the "MTO unit" column.

3. Enter the name of the respective unit of the collected objects that is stored in the unit system into the "Unit group" column.
   Example: If a value is specified in "kg" in isometry data, P&ID data, or in CSV, enter the following in the "Unit group" column: "E20.AA130"
   You can find additional information on this topic in the "COMOS Platform Administration" manual, keyword "Configuring units".

4. Enter the respective unit that is specified in the isometry data, P&ID data, or in CSV into the "Unit" column.

Result

A unit is entered into the properties of a created MTO object in accordance with the entries in this table. If you subsequently change the unit in the properties, the value is converted.

1.4 Configuring MTO creation from isometry data

1.4.1 Configuring the principles for MTO creation from isometry data

Procedure

1. Open the "Attributes > COMOS MTO" tab in the properties of the configuration object.
   See also chapter "COMOS MTO" tab (Page 41).

2. Navigate to the base object for pipes.
   Default: "@30 > M00 > A35 > A10 > A40 Pipe"

3. Drag&drop the object to the "Base object for pipes" field.

4. Navigate to the following base object:
   "@30 > M28 > A10 > A20 > A20 MTO object for engineering/released MTO"

5. Drag&drop the object to the "Base object for MTO objects" field.

6. Navigate to a base object whose engineering objects are to act as a collection point for MTO objects.
   See below, "How the folder collection point works" section.

7. Drag&drop the object to the "Base object for folder collection point" field.

8. Navigate to a base object with the "MTO > Collect material" command available in the context menu of its engineering objects.

9. Drag&drop the object to the "Base object for starting the isometry import" field.

10. If you wish, you can enter the nested name of an attribute of the engineering objects with the status "Current" or "Released" in the "Attribute name for status" field.
Once created, an MTO object is sorted into the relevant folder according to the attribute value.

Classification in folder	Condition
"Current"	• If the attribute value of the attribute specified in the configuration object in the "Attribute name for status" field has the value "Current". • If no entry is available in the "Attribute name for status" field and no revisions have been made to the isometry of the planned material or the revision has not been released.
"Released"	• If the attribute value of the attribute specified in the configuration object in the "Attribute name for status" field has the value "Released". • If no entry is available in the "Status for attribute name" field, but revisions have been made to the isometry of the planned material and released.

How the folder collection point works

If you collect material, a "Current" or "Released" folder is created under the superior folder collection point. The MTO objects are created in these folders.

All objects under the folder collection point are considered during the summation of the quantities.

Example: Unit as folder collection point

You have dragged the base object of a unit into the "Base object for folder collection point" field.

All units have the folder collection point function in the engineering view.
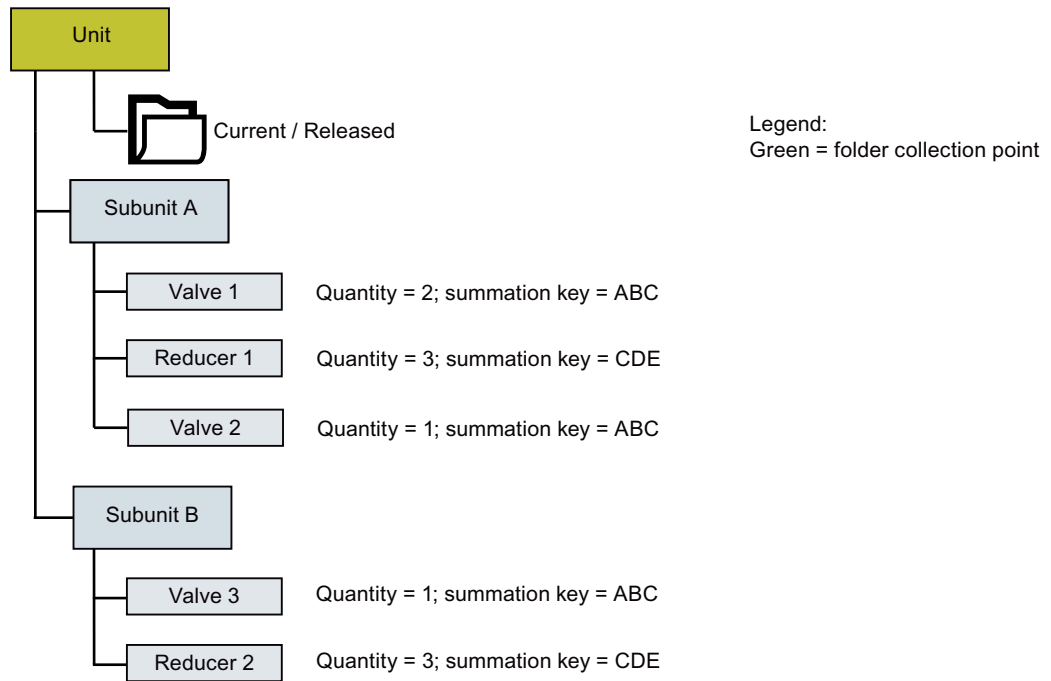
If you collect material at subunit A, a "Current" or "Released" folder containing the MTO objects is created underneath the unit.

Material with the same summation key is merged.

MTO objects of subunit A in the "Current" or "Released" folder:

Material	Quantity	Summation key
Valves (valve 1, valve 2)	3	ABC
Reducers (reducer 1)	3	CDE

If you subsequently collect material at subunit B, the material with the same summation key as this subunit is merged. However, material is not merged together for subunit A and B.

MTO objects of subunit A and subunit B in the "Current" or "Released" folder:

Material	Quantity	Summation key
Valves (valve 1, valve 2)	3	ABC
Reducers (reducer 1)	3	CDE
Valve (valve 3)	1	ABC
Reducers (reducer 2)	3	CDE

Example: Subunit as folder collection point

You have dragged the base object of a subunit into the "Base object for folder collection point" field.

All subunits have the folder collection point function in the engineering view.
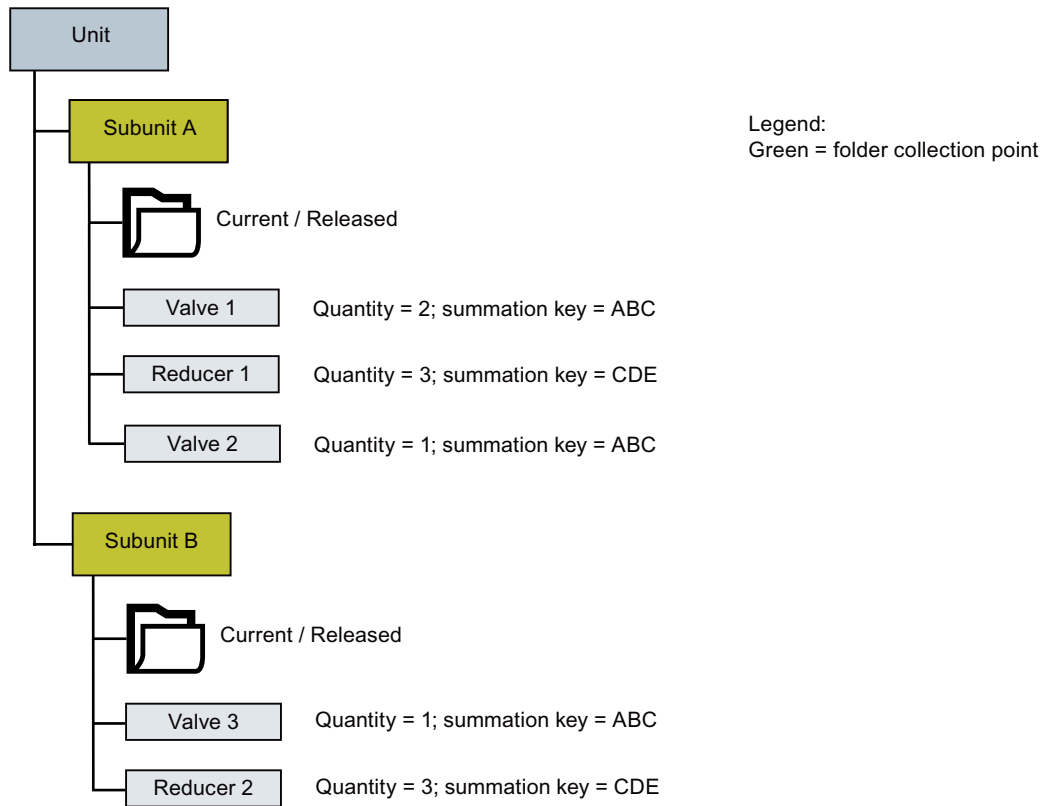
If you collect materials at subunit A, a "Current" or "Released" folder containing the MTO objects is created underneath subunit A.

Material with the same summation key is merged.

MTO objects of subunit A in the "Current" or "Released" folder:

Material	Quantity	Summation key
Valves (valve 1, valve 2)	3	ABC
Reducers (reducer 1)	3	CDE

If you subsequently collect material at subunit B, the material with the same summation key is merged under subunit B.

MTO objects of subunit B in the "Current" or "Released" folder:

Material	Quantity	Summation key
Valve (valve 3)	1	ABC
Reducers (reducer 2)	3	CDE

1.4.2 Defining filters for material selection for creating MTO objects

You can define filters which control the selection of material for creating MTO objects. If no filter is defined, MTO objects are created for all objects below the node for which you have executed the "Collect material" command.

Procedure

1. Open the "Attributes > COMOS MTO" tab in the properties of the configuration object.
   See also chapter "COMOS MTO" tab (Page 41).
   Edit the "Object identification" control group.

2. Write the nested name of an attribute of the isometry objects in the "Attribute" column.

3. In the "Condition" column, write a condition that the attribute must fulfill in order for it to be true. Keep in mind the possible operators. See chapter "COMOS MTO" tab (Page 41).
   If you choose the "set" or "unset" value, the "Value" column is omitted.

4. Write a comparison value in the "Value" column.

5. Optional: Define additional filters.

Result

If the condition of all defined filters for an isometry object is true, an MTO object is created when material is collected.

1.4.3 Assigning attributes

You can assign attributes of isometry objects to MTO object attributes.

Procedure

1. Open the "Attributes > COMOS MTO" tab in the properties of the configuration object.
   See also chapter "COMOS MTO" tab (Page 41).
   Edit the "Attribute list" control group.

2. In the "Isometry attribute" column, write the nested name of the attribute whose value is to be transferred to the MTO object.

3. In the "MTO attribute" column, write the nested name of the MTO object attribute in which the value is to be entered.

Result

The value of the attribute in the "Isometry attribute" column is transferred to the attribute in the "MTO attribute" column when material is collected.

1.4.4 Configuring the creation of the summation key

You can define a set of rules for creating a summation key based on the properties of an isometry object. The summation key is intended to identify the object uniquely. This is necessary so that objects that are assumed to be of the same type can be merged to form a single MTO object and the quantities can be added together as early as the collection of planned objects.

Structure principle of the summation key

Option 1: Comparing two values with one another

Possible values:

- Nested name of attributes
- Script call

Compare "Expression A" with "Expression B" based on the condition.

- If the comparison is true, the summation key receives the value from the "True value" column.
- If the comparison is wrong, the summation key receives the value from the "Wrong value" column.

Option 2: Using a fixed expression

Write a fixed value with quotation marks in the "Expression A" column. All additional columns are omitted.

The fixed value is used as a summation key.

Option 3: Verifying the existence of an attribute

Write the nested name of an attribute in the "Expression A" column and the "Set" or "Unset" value in the "Condition" column. The "Expression B" column is omitted.

- If the comparison is true, the summation key receives the value from the "True value" column.
- If the comparison is wrong, the summation key receives the value from the "Wrong value" column.

Option 4: Using a variable expression

Possible values:

- Nested name of attributes
- Script calls

Write a value in the "Expression A" column and do not fill in any other columns. Only the "Expression A" column is evaluated and used as a summation key.

Procedure

1. Open the "Attributes > COMOS MTO" tab in the properties of the configuration object. Edit the "Summation key" control group.

2. Create entries in the "Summation key" control group depending on which option you would like to use for the structure of the summation key.
   Keep in mind which values are allowed. See also chapter "COMOS MTO" tab (Page 41).

Examples of entries in the "Summation key" control group

Expression A	Condition	Expression B	True value	Wrong value
Y00T00001.Y00A00002				
Y00T00003.Y00A00744				
Y00T00003.Y00A00744AA02	set		Y00T00003.Y00A00744AA02	""

Explanation

Summation key = component type + nominal diameter 1 + nominal diameter 2 (if available)

Example of a summation key: REDU10080

Effect

When material is collected, all reducers with the same nominal diameters are merged to form a single MTO object and their quantities are added together.

1.4.5 Defining a reference value for establishing quantities

You can define whether the quantity of material is to be determined via their number of parts or the length.

● If you do not enter anything in this table, the number of parts of all pipes is added together.

● If you define conditions, the values of the attribute you have specified in the "Attribute" column are added together for all objects.

You can define several conditions. If a particular condition is not fulfilled, the subsequent ones are checked. If none of the conditions are fulfilled, the current pipe is skipped and not included in the quantity.

Procedure

1. Open the "Attributes > COMOS MTO" tab in the properties of the configuration object. Edit the "Quantities" control group.

2. Enter a value in the "Expression" column.

3. Enter an operand in the "Condition" column.
   The operand compares the expression with the value.

4. Enter a comparison value in the "Value" column.

5. Write the nested name of an attribute in the "Attribute" column.
   The value of the attribute is read out and added to the values of other objects. The sum of these values gives the total quantity.
   The attribute must contain the length of the pipe.

Result

The values of the attribute in the "Value" column are added together if the quantities are calculated.

See also

"COMOS MTO" tab (Page 41)

1.5 Configuring a CSV import

You can specify at which engineering objects the "MTO > CSV import" is to be available.

If no base object is specified here, the command is available at all objects.

Procedure

1. Open the "Attributes > CSV import" tab in the properties of the configuration object.

2. Navigate to a base object with the "MTO > CSV import" command available in the context menu of its engineering objects.

3. Drag&drop the object to the "Base object for starting the CSV import" field.

1.6 Configuring MTO creation from P&ID data

1.6.1 Configuring the principles for MTO creation from P&ID data

Procedure

1. Open the "Attributes > MTO estimation" tab in the properties of the configuration object.
   See also chapter "MTO estimation" tab (Page 43).

2. Navigate to the base object for pipes.
   Default: "@30 > M00 > A50| > A10 > A40| > A10 > A10"

3. Drag&drop the object to the "Base object for pipes" field.

4. Navigate to the following base object:
   "@30 > M28 > A10 > A20 > A10 MTO object for estimation material"

5. Drag&drop the object to the "Base object for MTO objects" field.

6. Enter the nested name of the attribute that specifies the main nominal diameter at P&ID objects.
   Standard: "Y00T00003.Y00A00744"
   The value is applied in the properties of the MTO object.

7. Enter the nested name of the attribute that specifies the outlet nominal diameter at P&ID objects.
   Standard: "Y00T00003.Y00A00744AA02"
   The value is applied in the properties of the MTO object.

1.6.2 Defining filters for material selection for creating MTO objects

You can define filters which control the selection of material for creating MTO objects. If no filter is defined, MTO objects are created for all objects below the node under which you collect material.

Procedure

1. Open the "Attributes > MTO estimation" tab in the properties of the configuration object. Edit the "Object identification" control group.
   See also chapter "MTO estimation" tab (Page 43).

2. Write the nested name of an attribute of the P&ID objects in the "Attribute" column.

3. Write an operator in the "Condition" column.
   Permitted operators: See chapter "MTO estimation" tab (Page 43).
   If you choose the "set" or "unset" value, the "Value" column is omitted.

4. Write a comparison value in the "Value" column.

5. Optional: Define additional filters.

Result

If the condition of all defined filters for a P&ID object is true, an MTO object is created when the material is collected.

1.6.3 Assigning attributes

You can assign attributes of P&ID objects to MTO object attributes.

Procedure

1. Open the "Attributes > MTO estimation" tab in the properties of the configuration object.
   See also chapter "MTO estimation" tab (Page 43).
   Edit the "Attribute list" control group.

2. In the "P&ID attribute" column, write the nested name of the attribute whose value is to be transferred to the MTO object.

3. In the "MTO attribute" column, write the nested name of the MTO object attribute in which the value is to be entered.

Result

The value of the attribute in the "P&ID attribute" column is transferred to the attribute in the "MTO attribute" column when material is collected.

1.6.4 Configuring the creation of the summation key

You can define a set of rules for creating a summation key based on the properties of an isometry object. The summation key is intended to identify the object uniquely. This is necessary so that objects that are assumed to be of the same type can be merged to form a single MTO object and the quantities can be added together as early as the collection of planned objects.

Structure principle of the summation key

See chapter Configuring the creation of the summation key (Page 11).

Procedure

1. Open the "Attributes > MTO estimation" tab in the properties of the configuration object.

2. Create entries in the "Summation key" control group depending on which option you would like to use for the structure of the summation key.
   Every row of the table is evaluated and forms a partial key.
   Keep in mind which values are allowed. See also chapter "MTO estimation" tab (Page 43).

Examples of entries in the "Summation key" control group

See chapter Configuring the creation of the summation key (Page 11).

1.6.5 Defining rules for estimating flanges

You can define rules that enable COMOS to include flanges in the estimation for specific P&ID objects.

Procedure

1. Open the "Attributes > MTO estimation" tab in the properties of the configuration object.
   Edit the "Rules for flange estimation" control group.
   See also chapter "MTO estimation" tab (Page 43).

2. In the "Expression" column, write an expression whose value is to be retrieved and compared with the value in the "Value" column.

3. Write an operand in the "Condition" column.

4. Write a comparison value in the "Value" column.

Example

Compare an attribute value with a value specified in this table.

Column	Entry
"Expression"	Requirement: You have created an attribute that describes the connection type of the component at the P&ID objects.
	You can find additional information on this topic in the "COMOS Platform Administration" manual, keyword "Creating an attribute".
	Y00T00135.<Attribute name>
"Operator"	=
"Value"	"Flanged"

Result

If a query yields the value "true", a flange is estimated for the P&ID object.

1.7 Configuring settings for MTO documents

1.7.1 Configuring general settings

Procedure

1. Open the "Attributes > MTO documents" tab in the properties of the configuration object.
   See also chapter "MTO documents" tab (Page 46).
   Edit the "General settings" control group.

2. In the "Name for MTO document package" field, enter how the name of a new document package is to be be constructed.
   Example:
   "PM." + Text(1) + "-" + Filter(1) + "-" + group

Component of the entry	Description
"PM."	Fixed value
Text(1)	Reference to the "Text fields" table
	The first value of the table is used
"-"	Fixed value
Filter(1)	Reference to the "Filter list" table
	The first value of the table is used
"-"	Fixed value
group	Reference to the value that the user has in the field in the "Material Management Assistant"

The index of a package is automatically added at the end of the name.
This results in the following names for MTO document packages: "PM.L10-B1-1", "PM.L10-B1-2", "PM.L10-B1-3", etc.

3. In the "Document key" field, enter how the document key of a new document is to be constructed.
   Example:
   "MTO-" + Text(1) + "-" + Text(1)

Component of the entry	Description
"MTO-"	Fixed value
Filter(1)	Reference to the "Filter list" table
	The first value of the table is used
"-"	Fixed value
Text(1)	Reference to the "Text fields" table
	The first value of the table is used

In the "Document key" field on the "Material Management Assistant > MTO Documents" tab, this results in the following entry: "MTO-B1-L10"

4. Enter an expression in the "User context" field.
   If you call the "Material Management Assistant" from the Navigator via the context menu, the user context is evaluated depending on the selected object.
   The user context is appended to each document process.
   Effect:

   – The "Documents" tab displays only the document processes which have the same user context as that determined at the object in the Navigator.

   – The "MPR documents" tab displays only those MTO keys of the documents which have the same user context as that determined at the object in the Navigator.

   Example: If the user context is `owner.name`, only those documents which have the name of the selected object in the Navigator as user context are displayed.

5. Navigate to a base object with the "MTO > Create MTO document" command available in the context menu of its engineering objects.

6. Drag&drop the object to the "Base object for creating MTO documents" field.

1.7.2 Defining authorization for users

Procedure

1. Open the "Attributes > MTO documents" tab in the properties of the configuration object.
   See also chapter "MTO documents" tab (Page 46).
   Edit the "Settings for authorization" control group.

2. Activate the corresponding options depending on which functionalities you wish to unlock for the user in the "Material Management Assistant".

1.7.3 Configuring the creation of MTO documents

Set up which MTO documents are to be part of a document package.

Note

Specify at least one document

You must enter data for at least one document. One line is provided for each document.

Procedure

1. Open the "Attributes > MTO documents" tab in the properties of the configuration object. See also chapter "MTO documents" tab (Page 46).
   Edit the "Documents" control group.

2. In the "Master" column, choose whether the document is to be a master document or not. A master document must exist for each document package.

3. Enter a name in the "Name" column to identify the document internally. The name must be clear.
   Example: "Doc1"

4. Enter the name of the document as it is to be displayed in the "Material Management Assistant" in the "Document Name" column. If several package groups are specified, a name such as this can be used unchanged for several package groups.
   Example: "CoverSheet"

5. Optional: Enter the label and the description.

6. Enter the name of the appropriate report template in the "Report" column.
   You can find suitable report templates in the "Base objects" tab in the Navigator under the following node: "@30 > M28 > A80 Documents".

7. Enter a number for the package index in the "Package group" column. All documents with the same package index are filed in the same package group.
   Example: "1" or "2"

8. In the "XML" column, specify whether an XML file containing material data is to be created for the MTO document.

9. Confirm your entries.

Example

Master	Name	Document name	Label	Description	Report	Package group	XML
Yes	Doc1	DAT		Material Assembly List Group	MTO.002	1	Yes
No	Doc2	CoverSheet			MTO.001	1	No

1.7.4 Configuring filters for objects in MTO documents

You can set which objects are to be displayed within the material lists in MTO documents.

Procedure

1. Open the "Attributes > MTO documents" tab in the properties of the configuration object. Edit the "Filter" control group.

2. Enter the MTO document for which the filter is defined in the "Document" column. Use the name that you have entered in the "Name" column in the "Documents" control group. See also chapter Configuring the creation of MTO documents (Page 19).

3. Enter the name of a column in "Column" in the material lists. The filter will be used for this column of the material lists.

4. Enter an operator in the "Condition" column.

5. Optional: Enter a script call or the nested name of an attribute in the "Value" column. If you do not enter a value, the user enters the value in the "Material Management Assistant" on the "MTO documents" tab. If you enter a value: If the user starts to create MTO documents via the context menu of an object in the Navigator, the value is evaluated and transferred to the "Material Management Assistant".

1.7.5 Assigning material lists

Specify the material lists on which the creation of MTO documents is based.

Prerequisite

You have created material lists for estimated material, planned material, and released material. See chapter Creating material lists (Page 27).

Procedure

1. Open the "Attributes > MTO documents" tab in the properties of the configuration object. Edit the "Material list" control group.

2. Select the material list on the "Units" tab in the Navigator.

3. Drag&drop this into the appropriate edit field of the "Material list" control group.

4. Repeat these steps for the remaining material lists.

1.7.6 Configuring the grouping of documents

You can group the display mode in MTO documents based on a column of the material list.

Procedure

1. Open the "Attributes > MTO documents" tab in the properties of the configuration object. Edit the "Grouping" control group.

2. Enter the name in the "Documents" column to identify the document internally. The value must be identical to one of the names in the "Documents" control group in the "Name" column.

3. In "Column", enter the name of a column within the material list according to which the display mode in the MTO documents is to be grouped.

4. Enter the hierarchy level for the grouping in the "Level" column.
   This must be consecutively numbered for each document level.
   Example:
   Level 1 stands for the first grouping, level 2 for a subgroup of the first grouping, etc.
   For a first document (Doc1), the elements to be listed are grouped first by "TechnoCode".
   Within this grouping, they are also grouped by "PipeName".

"Document"	"Column"	"Level"
Doc1	CommodityCode	1
Doc1	PipeName	2

1.7.7 Editing text fields of MTO documents

You can define the fields to be displayed on the specified documents. For instance, you could enter the author.

Procedure

1. Open the "Attributes > MTO documents" tab in the properties of the configuration object. Edit the "Text fields" control group.

2. In the "Document" column, enter the MTO document on which the text fields are to be displayed. Use the name that you have entered in the "Name" column in the "Documents" control group.

3. Enter the name that is to be displayed for the text field in the "Field" column.

4. Optional: Enter the content of the text field in the "Value" column.
   If you do not enter a value, the user enters the value in the "Material Management Assistant" on the "MTO documents" tab.
   If you enter a value, the value is evaluated and transferred to the "Material Management Assistant".

5. Confirm your entries.

1.8 Configuring orders

1.8.1 Configuring general settings

"MPR document" is used as a synonym for order lists.

Procedure

1. Open the "Attributes > Orders" tab in the properties of the configuration object.
   Edit the "General settings" control group.

2. In the "MPR package name" field, enter how the name of a new MPR package is to be constructed.
   See chapter Configuring general settings (Page 17).

3. In the "Document key" field, enter how the document key of a new document is to be constructed.
   See chapter Configuring general settings (Page 17).

4. In the "Summation column" field, enter the name of a column in the material list from which basic material is to be added up and merged.
   Example: Order no.

5. Complete the "MPR package ID" field.
   The MRP package ID is constructed like the document key. See chapter Configuring general settings (Page 17).
   This entry forms the name of the MPR documents.

6. In order to allow users to revise the MPR documents, activate the "Allow revision" option.

7. Confirm your entries.

1.8.2 Configuring the creation of MPR documents

Set up which MPR documents are to be part of an MPR document package.

Note

Specify at least one document

You must enter data for at least one document. One line is provided for each document.

Note

Create at least one XML file

You must create an XML file for at least one document per MPR document package.

Procedure

1. Open the "Attributes > Orders" tab in the properties of the configuration object.
   Edit the "Documents" control group.

2. Additional steps: See chapter Configuring the creation of MTO documents (Page 19).

1.8.3 Creating additional columns for MPR documents

You can expand the table of documents to be ordered on the "MPR Documents" tab in the "Material Management Assistant" by any number of columns.

Procedure

1. Open the "Attributes > Orders" tab in the properties of the configuration object.
   Edit the "Additional columns" control group.

2. In "Column name", enter the name of the column that you wish to create.

   – If you wish to create a column that adopts the values of a column from the material list, you have to enter the column name here exactly as it appears in the material list.

   – If you wish to create an empty column, enter any column name.

3. In the "Editable" column, enter whether or not the column is to be enabled for editing by the user.

   – Value "No": Column cannot be edited

   – Value "Yes": Column can be edited

4. In the "Quantity relevant" column, enter whether the contents of the column are to be taken into consideration when the material is calculated.

   – Value "No": Material quantity is ignored

   – Value "Yes": Material quantity is taken into consideration

   If the user enters a positive value in the column created in the "Material Management Assistant", it is added to the material quantity.
   If the user enters a negative value in the column created in the "Material Management Assistant", it is subtracted from the material quantity.

1.8.4 Editing text fields of MTO documents

You can define the fields to be displayed on an MPR document. For instance, you could enter the author.

Procedure

1. Open the "Attributes > Orders" tab in the properties of the configuration object.
   Edit the "Text fields" control group.

2. Enter the name that is to be displayed for the text field in the "Name" column.
   Example: "Author"

3. Optional: Enter the content of the text field in the "Value" column.
   If you do not enter a value, the user enters the value in the "Material Management Assistant"
   on the "MPR documents" tab.
   If you enter a value, the value is evaluated and transferred to the "Material Management
   Assistant".

4. Confirm your entries.

1.9 Configuring delta documents

Prerequisite

You have created a report for delta documents in the engineering view.

Base object: "@30 > M28 > A80 > MTO.004 MTO delta list"

Procedure

1. Open the "Attributes > Delta documents" tab in the properties of the configuration object.

2. Drag&drop the delta list from the "Units" tab to the "Report for delta documents" field.

3. In the "CSV separator" field, enter the character used as a separator in CSV files.

4. In the "Export folder" field, specify the folder to which delta documents are to be exported
   by default when they are created.

1.10 Configuring manual estimation of P&ID data

Only the components that were extracted from the P&ID are listed on the "PID estimation" tab.
However, parts that are not listed on the P&ID (such as elbows) should also be added during
manual estimation.

Procedure

1. In the "Standard GTypes" control group, enter the component types that are to be displayed to the user on the "Manual estimation" tab during manual estimation.
   You can find additional information on this topic in the "COMOS Material Management Operation" manual, keyword "Assigning further components".

2. To call a component type from a standard table, click in an empty field.
   The standard table contains the stored component types, for instance "ELBO – fitting elbow" or "Tube – implied tube".
   Optional: To be able to distinguish between COMOS and PDMS component types, change the component types standard table.

   – For PDMS pipe specs: "Y10 > M23 > A10 > Y10M23N00002 GTYPE"

   – For COMOS pipe specs: "Y10 > M23 > A10 > Y10M23N00001 Function code"

   The user can view additional selectable manufacturer devices on the "Manual estimation" tab.

3. In the "Additional columns" control group, define additional columns which are also to be displayed on the "PID estimation" tab.
   This has the purpose of providing information for the user. The information displayed in the columns always refers to the component in the pipe spec. The file extension here is either a script call or an attribute name.

4. Enter a column name.

5. Enter an attribute name or a script call in the "Expression" column.
   Example: "Owner.Owner.Name". This evaluates 2 levels of the owner and states the name of the upper owner.

6. Enter the width of the column in pixels.
   Example: "100"

Material lists

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2.1 Types of material lists

Material list type	Description
"Parts list"	Groups materials based on their pipe.
"Unit list"	Groups the material based on the unit in which it is located.

"Delta list"	Calculates the difference between the following documents:
	
	• Between successive revisions, or between the most recently released and currently pending revisions of an MTO document
	
	• Difference between currently pending revisions of the following MTO types:
	   – Estimated MTO and Current MTO
	   – Estimated MTO and Released MTO
	   – Current MTO and Released MTO

2.2 Creating material lists

Material lists form the basis for creating MTO documents. The lists contain all data that will be transferred to the MTO documents on the basis of filters. You may create a material list for each MTO level.

Procedure

1. In the Navigator, select the following object in the base data:

2. "@20 > A70 > Y20 > M28 MTO (Material Management)".
   Below this object, you will find predefined material lists for the different MTO levels.

3. Drag&drop a material list to the engineering project.

4. You have the option of adding one or several columns to the material list,
   but you may not delete any of the predefined columns.

5. Save the material list.

6. Open the "Attributes > MTO documents" tab of the configuration object.

7. Drag&drop the material list you have created from the Navigator to the corresponding field of the "Material lists" control group.

Result

When you select the corresponding entry from the "MTO level" list of the "MTO documents" tab in the "Material Management Assistant", material is taken from the material list that you have created and linked.

See also

Configuring the display of the quantity data delta between revision

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You can check if the quantity data for the current revision of an MTO document has changed by comparing it against a revision that has already been released. To display the deviations in an MTO document, you must edit the report template of the MTO document in the base project.

Procedure

1. In the base project, define two new columns in the "MTOContent" and "MTOTitle" sub reports:

    – Column for the delta values
      The deviating quantity in the MTO document is specified here.

    – Column for the status
      In the MTO document, it is specified here whether a material group has been added or removed or whether there was no change.

2. Specify how these values are to be determined in the script in the report template of the MTO document.
   Example:

```
Dim DeltaValue
Dim DeltaStatus
DeltaValue = CurrentItem.GetAttributeValue("DeltaValue")
DeltaStatus = CurrentItem.GetAttributeValue("DeltaStatus")
```

Result

If you make a revision, the columns containing the corresponding information are additionally displayed in the MTO document.

Creating and managing the MTO set of rules 4

Sets of rules are used to automatically calculate additions for the estimated quantities. The selection of the appropriate rules for a component is based on the relevant properties of the component. These properties include the number of parts, the nominal diameter, and the type.

Sets of rules can be created or managed in the standard tables.

Procedure

To create an MTO set of rules, proceed as follows:

1. To call the standard tables, call the "Administrator > Base data > Standard tables" menu command.

2. Activate the "Base" option.

3. To edit the MTO rulesets, open the following object:
   "Y10 > M28 > A10 > A10 > Y10M28N00002 MTO ruleset".

4. To view, delete, modify, or re-create the sets of rules shown in table format, double click on "31".

The table entries have the following meanings:

Column	Description
"Name"	Numbering increasing sequentially without gaps
"Description"	Name of ruleset Example: "L09-10/5 %"
"Value 1"	Component type Example: "TUBE". If a component type is not listed in the ruleset, enter "ELSE".
"Value 2"	Maximum nominal diameter Example: "50.0"
"Value 3"	Maximum quantity Example: "10.0"
"Value 4"	Margin in % Example: "10"
"Value 5"	Rounding Example: "6". This example involves a number that is divisible by the value "6".
"Value 6"	Cumulative number of parts Example: "0"

Example

Name	Description	Value 1	Value 2	Value 3	Value 4	Value 5	Value 6
00001	L09-10/5 %	TUBE	50.0	10.0	0	6	0
00002	L09-10/5 %	TUBE	50.0	200.0	10	6	0
00003	L09-10/5 %	ELSE	10.0	99999.0	0	1	0

During MPR document creation, the user selects the name of a set of rules. The corresponding rule from the list described here is applied for the component and its number of parts.

The percentage margin is calculated and then rounded to a value divisible by a specified number. In addition, a supplementary margin is added. The resulting number represents the margin for a component.

Configuring the material status in AVEVA PDMS

5

You have the option of locking status changes for a material in AVEVA PDMS and specifying a status for the material at the same time. You can find additional information on this topic in the "COMOS Material Management Operation" manual, keyword "Locking status changes in PDMS".

You can automate the process of locking buttons for status changes by creating a StartupFunction, for example, which creates the configuration object and calls corresponding functions there.

Configuring a CSV import

6

6.1 Structure of a CSV file

To import CSV files, they must have the structure shown below. The separator between the individual entries in the CSV file must be a semicolon.

Example

This is a representation of the CSV file in Microsoft Excel.

Current	today	XXXXXX										
Subsection	Owner	ItemCode	Shop	Quantity	Description	Type	Unit	ND1	ND2	Weight	Filter	OrderID
Steel	P1M1T105	HE100A/S	F	34	I-Beam HE	BEAM	m	96		16. Jul	A	BEGG26
Steel	P1M1T105	HE100A	F	13	I-Beam HE	BEAM	m	96		16. Jul	A	BEGG25
Steel	P1M1T105	HE120A	F	81	I-Beam HE	BEAM	m	114		19. Sep	B	BEJJ34
Steel	P1M1T105	HE120A	F	34	I-Beam HE	BEAM	m	114		19. Sep	B	BEGG34
Steel	P1M1T105	HE140A	F	97	I-Beam HE	BEAM	m	133		24. Jul	C	BEGG35
Steel	P1M1T105	HE140A	F	24	I-Beam HE	BEAM	m	133		24. Jul	C	BEHH34
Steel	P1M1T105	HE160A	F	23	I-Beam HE	BEAM	m	152		30. Apr	C	BEHH01
Steel	P1M1T105	HE160A	F	12	I-Beam HE	BEAM	m	152		30. Apr	C	BEAA67
Steel	P1M1T105	HE1000x4	F	7	I-Beam HE	BEAM	m	1020		415	C	BEGG24
Steel	P1M1T105	HE1000x4	F	10	I-Beam HE	BEAM	m	2		437	B	BECC78

Row 1

This row contains settings which it is mandatory to make.

Column	Description
1	This value specifies whether the material will be created in the "Estimated", "Current", or "Released" folder during import. Possible values: • "Estimated" • "Current" • "Released" Make sure that the spelling is correct.
2	You enter a timestamp here, which can take any format you wish.
3	You enter a key for the CSV file here. Every file must have a unique key so that existing data in COMOS can be overwritten the next time an import is performed with the same key. If an MTO document has been created from data which has already been imported and revisions have been made to that document, new "Estimated", "Current", and "Released" folders are created and incremented with a counter the next time an import is performed with the same key.

Row 2

This row contains the column headers for the table which describes the material. Please note that the names of the columns are case-sensitive; if the spelling and case do not exactly match the original, errors will occur during the import.

Mandatory columns:

Column	Description
"Subsection"	Name of the subsection which you have created below the configuration object. The assignment of the SystemFullName and the storage position of the MTO objects, for example, are defined in this subsection. See also chapter Editing configurations for the CSV import (Page 36).
"Owner"	Name of the object below which an MTO object is to be created. The name of the owner is decoded using the assignment table in the subsection. See also chapter Editing configurations for the CSV import (Page 36).
"ItemCode"	Identification code
"Shop"	Workshop or construction site production Possible values: • `true` • `false`
"Quantity"	Amount of material
"Description"	Description of material
"Type"	Type of material
"Unit"	Unit of quantity

Optional columns:

You can create as many other optional columns as you wish. The header of every additional column must contain the exact name of an attribute which is already available at the base object of the MTO object and whose value you want to enter via the CSV import.

Row 3 - n

The material being imported is described here. Each row corresponds to one component.

6.2 Editing configurations for the CSV import

Configurations for the CSV import are objects which are used to provide various settings for the CSV import. In particular, they perform the following functions:

● Deriving the path where an MTO object is to be created from the name of the owner specified in the "Owner" column in the CSV file.

● Creating the MTO object at the position defined by the owner in the tree structure.

● Completing the owner structure of the MTO object according to the specifications relating to the name of the owner.

Procedure

1. Create a "Configuration for CSV import" object using the context menu below the configuration object.

2. Open the "Attributes > General settings" tab. See also chapter "Configuration for CSV import" object (Page 40).

3. Drag&drop a base object to the "Base object for revision folder" field.
   See also chapter Configuring folders (Page 6).

4. Drag&drop the following base object to the "Base object for MTO objects" field:
   "@30 > M28 > A10 > A20 > A20 MTO object for engineering/released MTO"

5. Enter the required settings in the "Name mapping for MTO owner" table. See also sections "Configuration for CSV import" object (Page 40) and Algorithm for generating a COMOS path name (Page 37).

6.3   Algorithm for generating a COMOS path name

Introduction

To find the path to the MTO object which is to be created, COMOS uses the "Name mapping for revision folder" table at a "Configuration for CSV import" object to deconstruct the specification in the "Owner" column of the CSV file into its constituent parts. The interface then uses the parts of the name to derive the path to the correct node in the tree structure where an MTO object is to be created.

See also chapter "Configuration for CSV import" object (Page 40).

Algorithm

The following steps are performed when executing the mapping table:

1. Starting with the first part of the name, COMOS extracts the SystemFullName from the specification in the "Owner" column. To do this, COMOS evaluates the start index and the number of characters of the associated mapping entry.
   For the last name part, the mapping entry on the far right is used; for the penultimate name part, the second mapping entry from the right is used, and so on.

2. The interface processes the individual mapping entries, starting with the one on the far left.

The following algorithm is executed for each mapping entry:

1. The entry in the "Data item" row is checked:

   – Name of a String Parameter:
   Consequence: A corresponding COMOS node does not exist for the name part.
   Continue with step 2.

   – Name or label of a COMOS object:
   If there is one: The prefix and postfix are removed from the part of the name.
   The remainder of the string represents the name or the label of an MTO COMOS. It is
   copied to the path list.

   – Nothing entered: Continue with step 2.

2. If the "Data item" row is empty or contains a String Parameter, a check is made whether
   the "Fixed name" row has been configured:

   – "Fixed name" not set: The processing of the mapping table is aborted for the object.

   – "Fixed name" set: The entered or resulting string is written to the path list.

Once all mapping entries have been processed, the sequence of the entries in the path list is
reversed.

Result

- The string written to the path list produces the path to the MTO object to be created.

- If the object does not exist yet, the mapping table returns all needed information in order
  to create it. The name part of the last mapping entry is written to the "Name" property of
  the COMOS object.

- If the interface detects that the owner structure of the object you are looking for is
  incomplete: The mapping table provides all the information needed to complete the owner
  structure, if a base object has been specified for every hierarchy level.

References 7

7.1 MTOExportSettings.dat

MTO transfer

The paths to the folders which are relevant for the MTO transfer are specified in this file. The path to the file must be specified in an INI file which you have created. You can find additional information on this topic in the "3D Integration Administration" manual, keyword "INI file".

The MTOExportSettings.dat file must be located in the following folder: %<PRJ>DFLTS%.

The file name MTOExportSettings.dat is just an example; any name can be used.

Note

You are not permitted to change the structure of this file, just the values.

Row in the file	Meaning
One	Possible values: • C • R Specifies whether the material has the status Current or Released
Two	Path to the folder in which the material files must be stored
Three	Path to the folder in which the XML files for pipes created by AVEVA PDMS with the status Current are stored
Four	Path to the folder in which the XML files for pipes created with the status Released are stored
Five	Path to the folder in which the created XML files for pipes are stored, if AVEVA PDMS is in IsoDraft mode
Six	Path to the Subclasses.xml file
Seven	Path to the folder containing the exportMTO files
Eight - n	For batch mode: Each row has a reference to an object in AVEVA PDMS whose MTO data is to be transferred to COMOS

Example

R

D:\MTOExport\MaterialFiles

D:\MTOExport\CurrentMTO

D:\MTOExport\Released

D:\MTOExport\Iso

C:\ComosTemp\Configuration\Subclasses.xml

7.2 User interface reference

7.2.1 "Configuration for CSV import" object

You create a subsection on the engineering side in the context menu of the configuration object in the Navigator.

Open: "Attribute > General settings" tab

"Base objects" control group

Field	Description
"MTO owner"	Base object of the owner of the MTO folder in the Navigator. If the owner specified in the CSV file does not exist, it is created again.
	Has the same function as the last column used in the "Base object of the 'Name mapping for MTO owner' table" row.
"MTO object"	Base object of the MTO object being created.
	Has the same function as all columns up to the last one used in the "Base object of the 'Name mapping for MTO owner' table" row.

"Name mapping for MTO owner" table

Row name	Function	Comment
"Prefix"	The prefix in the "Owner" column.	Used to break down the specification in the "Owner" column of the CSV file.
"Postfix"	The postfix in the "Owner" column.	
"Data item"	The basis for generating names. For example: "U2L" Meaning: unit tree, level 2, label. Stands for the label of the object at the second level of the unit tree.	
"Start index"	The insertion point for the SystemFullName within the full specification in the "Owner" column of the CSV file.	
"Number of characters"	The length of a data item at the corresponding hierarchy level.	

Row name	Function	Comment
"Base object"	Base object used to create an object.	Only used to complete the owner structure of the MTO object or to create the MTO object.
"Base object from structure"	Flag which indicates whether the engineering structure linked to the project is used to create an object.	
"Fixed name"	The name of a COMOS object used to structure the COMOS data.	Only used to generate a path to a COMOS object.

The table columns represent the hierarchy levels of the objects in the Navigator.

7.2.2 Tabs of the configuration object

7.2.2.1 "COMOS MTO" tab

On this tab, configure the creation of MTO objects from isometry data.

See also chapter Configuring MTO creation from isometry data (Page 7).

Field	Description
"Base object for pipes"	Mandatory field. For defining a base object template for pipes on isometries. COMOS searches for material under the engineering objects.
"Base object for MTO objects"	Mandatory field. For defining a base object template for creating new MTO objects.
"Base object for folder collection point"	Mandatory field. Base object for engineering objects under which MTO objects are to be merged and added up.
"Base object for starting the isometry import"	Optional field. Base object of the engineering objects with the "MTO > Collect material" command available in the context menu. If no base object is specified here, the command is available at all objects.
"Attribute name for status"	Optional field. Attribute name of an attribute at the planned material, which specifies whether the material is "Current" or "Released". A folder with this name is created and the created MTO object is sorted according to the attribute value.

"Object identification" control group

Column	Description
"Attribute"	A script call or attribute of the P&ID object that is to be retrieved.
"Condition"	Condition which the attribute must fulfill. The following operators can be used: ● "=" ● ">" ● "<" ● ">=" ● "<=" ● "<>" (not the same) ● "like" ● "set": Checks that the attribute specified exists ● "unset": Checks that the attribute specified is missing
"Value"	Comparison value. Possible values: ● Fixed values in quotation marks ● Nested name of an attribute ● Script call

"Attributes list" control group

Column	Description
"MTO attribute"	Nested name of an attribute of MTO objects
"Isometry attribute"	Nested name of an attribute of isometry objects

"Summation key" control group

Column	Description
"Expression A"	Possible values • Nested name of an attribute • Fixed value with quotation marks • Script call
"Condition"	Possible operators: • "=" • ">" • "<" • ">=" • "<=" • "<>" (not the same) • "like" • "set": Checks that the attribute specified exists • "unset": Checks that the attribute specified does not exist
"Expression B"	Possible values • Nested name of attributes • Scripts
"True value"	You can enter a value in the following format: • Fixed value with quotation marks • Nested name of an attribute • Script call
"Wrong value"	You can enter a value in the following format: • Fixed value with quotation marks • Nested name of an attribute • Script call

See also chapter Configuring the creation of the summation key (Page 11).

7.2.2.2 "MTO estimation" tab

On this tab, configure the creation of MTO objects from P&ID data.

See also chapter Configuring MTO creation from P&ID data (Page 14).

Field	Description
"Base object for pipes"	Mandatory field. For defining a base object template for pipes on isometries. COMOS searches for material under the engineering objects.
"Base object for MTO objects"	Mandatory field. For defining a base object template for creating new MTO objects.

Field	Description
"Attribute name for inlet nominal diameter"	Nested name of the attribute at the P&ID object that the main nominal diameter describes.
"Attribute name for outlet nominal diameter"	Nested name of the attribute at the P&ID object that the branch nominal diameter describes.

"Object identification" control group

Control element	Description
"Only objects with implementation" option	Activated: Additional elements of the "Object identification" control group are deactivated due to the implementation. You can find more information on this topic in the "COMOS Platform Operation" manual, keyword "Requests and implementations".
"Attribute" column	A script call or attribute of the P&ID object that is to be retrieved.
"Condition" column	The following operators can be used: ● "=" ● ">" ● "<" ● ">=" ● "<=" ● "<>" (not the same) ● "like" ● "set": Checks that the attribute specified exists ● "unset": Checks that the attribute specified is missing
"Value" column	Comparison value. Possible values: ● Fixed values in quotation marks ● Nested name of an attribute ● Script call

"Attributes list" control group

Column	Description
"MTO attribute"	Nested name of an attribute of MTO objects
"P&ID attribute"	Nested name of an attribute of P&ID objects

"Summation key" control group

Column	Description
"Expression A"	Possible values • Nested name of an attribute • Fixed value with quotation marks • Script call
"Condition"	Possible operators: • "=" • ">" • "<" • ">=" • "<=" • "<>" (not the same) • "like" • "set": Checks that the attribute specified exists • "unset": Checks that the attribute specified does not exist
"Expression B"	Possible values • Nested name of attributes • Scripts
"True value"	You can enter a value in the following format: • Fixed value with quotation marks • Nested name of an attribute • Script call
"Wrong value"	You can enter a value in the following format: • Fixed value with quotation marks • Nested name of an attribute • Script call

Rules for estimating flanges

See also chapter Defining rules for estimating flanges (Page 16).

Column	Description
"Expression"	The "Expression" column is compared with the "Value" column. Possible values • Nested name of attributes • Scripts
"Condition"	Possible operators: • "=" • "like" • "set": Checks that the attribute specified exists • "unset": Checks that the attribute specified does not exist
"Value"	Fixed value with quotation marks.

7.2.2.3 "MTO documents" tab

"General settings" control group

See also chapter Configuring general settings (Page 17).

Field	Description
"Name for MTO document package"	Mandatory field. Possible values: • Fixed values in quotation marks • Attributes of the "MTO documents" tab • Operands
"Document key"	Mandatory field. • Fixed values in quotation marks • Attribute name of the "MTO documents" tab • Operands
"User context"	Possible values: • Script call • Attribute name
"Base object for creating MTO documents"	Optional field.

"Documents" control group

See also chapter Configuring the creation of MTO documents (Page 19).

Column	Description
"Master"	Mandatory field. "Yes" or "No" entry.
"Name"	Mandatory field. Name for identifying a document internally.
"Document name"	Name of the document displayed in the "Material Management Assistant".
"Label"	-
"Description"	-
"Report"	Mandatory field. Report template of the document.
"Package group"	Mandatory field. Documents are filed in the same package group if they have the same entry in this column.
"XML"	Possible values: • Yes • No