CADvent Plug-In for MagiCAD

for version 1.6

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Manual for Lindab CADvent Plug-in for MagiCAD

General Information

The Lindab CADvent Plug-In is developed to support CADvents advanced production orientated features on top of MagiCAD using the production orientated objects in MagiCAD.

Additional to this, the Plug-In offers features that are also available on computers without MagiCAD.

Please read more about this in ‘List of functions and User Interface’

Installation and activation

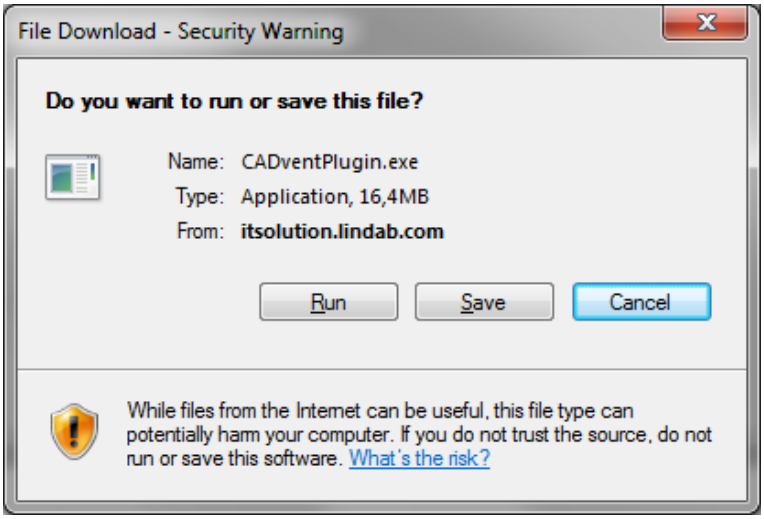
The latest version of the CADvent Plug-in can be downloaded from http://itsolution.lindab.com/downloads/cadventplugin/cadventplugin.exe

Installation requirements

The CADvent Plug-in supports MagiCAD 2011.4 or higher which runs on AutoCAD 2008 to AutoCAD 2012 on 32-bit computers and AutoCAD 2009 to 2015 on 64-bit computers including AutoCAD verticals. The Plug-in supports Windows XP 32-bit, Windows Vista, Windows 7 and Windows 8.

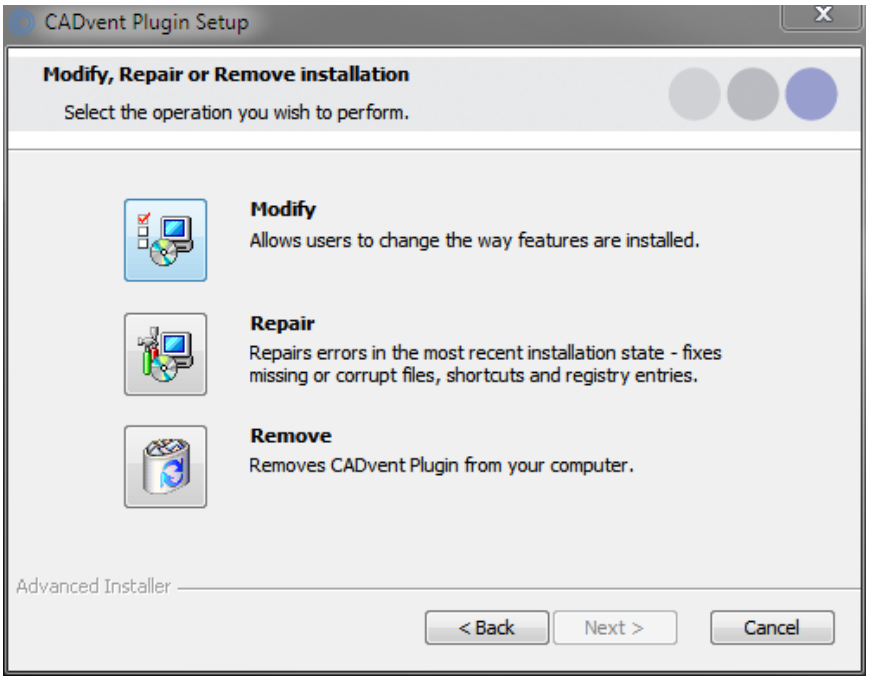
NOTE: You need to have local administrator rights to install the Plug-in on your computer.

Installation process

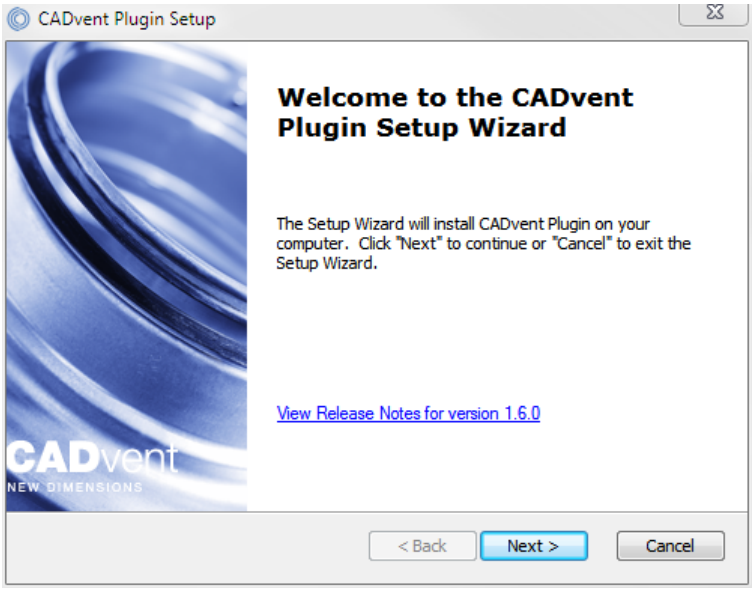


Download the installation file and save it on your computer for later installation or install it by pushing the “Run” button. If you have an earlier version of CADvent Plug-In installed the installation process first likes to uninstall the current version of the Plug-In.

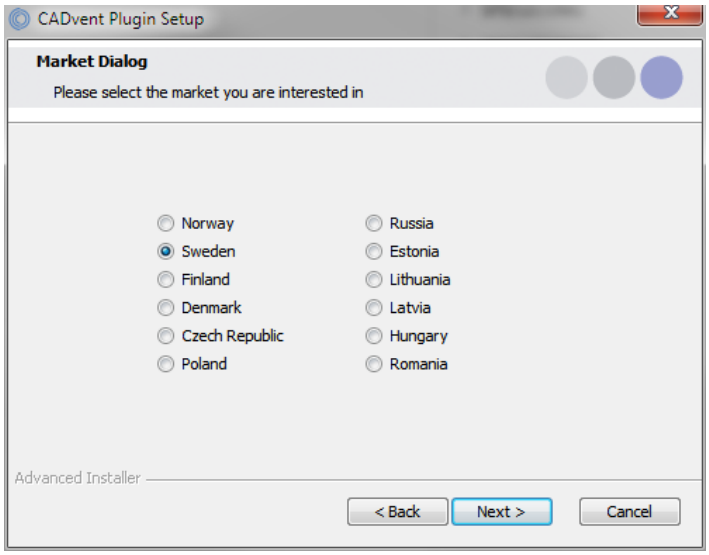
Press *Next* and in the following Window *Remove* to uninstall the current version.



Now you can install the software. Please activate the installation file again. The newest features can be listed up with the link you can find in the middle of the popup window.

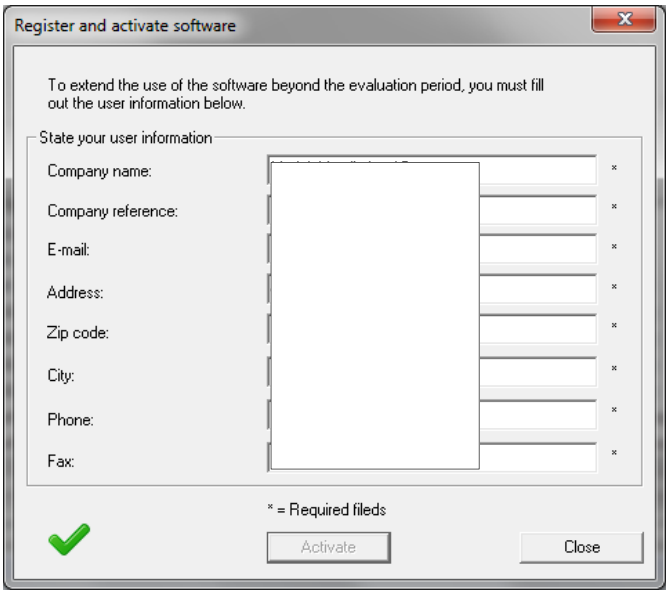


The next dialog ask you to select a market area. The selection includes certain translations and local settings for the production such as standard duct lengths and flange types:



At the end of the installation process you will be asked to register the software. Enter your contact details and press “Activate”, the green tick confirms the activation. Then close the dialog by pressing the “Close” button.

NOTE: You need to be online for the registration process.



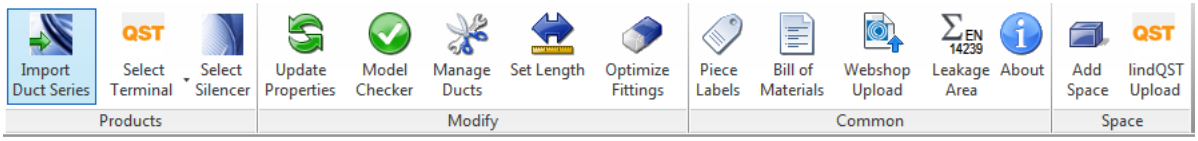
Now the installation is completed and you can launch MagiCAD including the CADvent Plug-in.

List of functions and User Interface

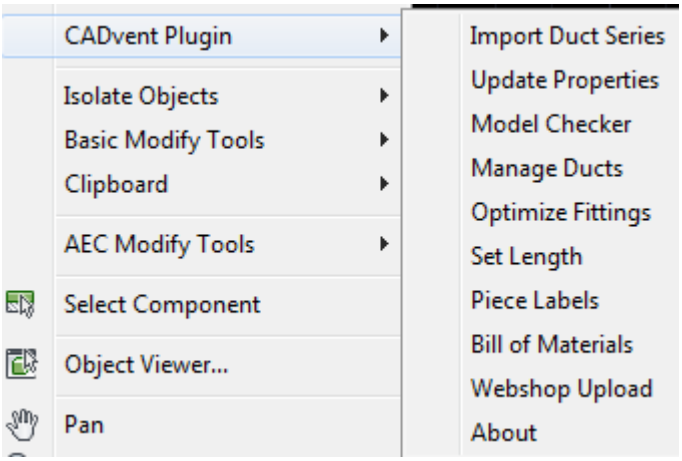
Graphical User Interface for CADvent Plug-In with MagiCAD

The CADvent Plug-In on computers with MagiCAD contains two possibilities to access the commands. A right-click menu and a Ribbon palette. Both types of interface contain full functionality. The Ribbon palette is available from AutoCAD 2010 or newer versions.

Ribbon palette



Right-click menu



Graphical User Interface for CADvent Plug-In without MagiCAD

The CADvent Plug-In on computers without MagiCAD contains a Ribbon palette to access the commands.

List of functions

This function allows the user to import non-generic, will say ”real products” into an existing MagiCAD Duct Series or to create a new Duct Series with Lindab products.

The Update Properties function allows MagiCAD to update MagiCAD objects with additional information.

With Manage Ducts you can cut ducts into standard lengths and insert connectors and flanges.

This function allows the user to set a specific length to a new or existing round or rectangular duct.

Optimize Fittings allows the user to “absorb” short pieces of duct to optimize the production.

The Model Checker checks the drawing for ventilation objects which do not fulfill the demands to be a real product. These objects are filtered out when you upload products from the drawing into the LindabWebshop.

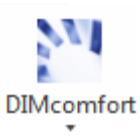
Piece label allows you to give each ventilation product a unique identifier which is also shown in the Bill-of-Materials.

Generates reports for all ventilation products.

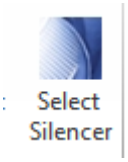
The webshop upload to Lindab’s Eshop is only supported for Denmark and Sweden at the moment. This feature offers our customers to upload products which follow the production model to order them online.

In the About button you can find information about market settings, contact information and CADvent plug-in version number.

Opens a web browser to Lindab lindQST web selection tool. Here you can select or calculate Air and Water products and export them to MagiCAD. The side also presents all product documentation, electrical wiring schemes and more…



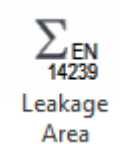
Opens a connection with DIMcomfort to select air devices.



Opens a connection with DIMsilencer to select silencers.

Create a 3D space object to add room informations for uploading to lindQST, to calculate air devices or water products optimized for the specific room requirements

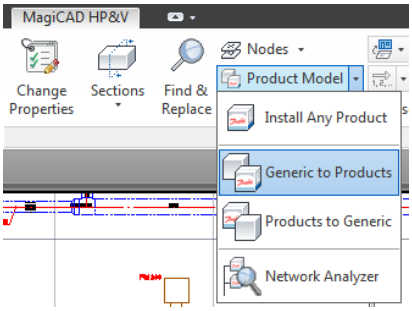
Upload the 3D spaces to lindQST



Leakage and Leakage Area Calculation

Functionality of the Lindab CADvent Plug-in

The CADvent Plug-in is designed to complete the production model in MagiCAD which was introduced in version 2010.5 and to a similar production model as in CADvent. As requirement you should draw or convert the MagiCAD ventilation objects in your drawing in a production model.



For more information please read the MagiCAD User Documentation -> Ventilation -> Production Model.

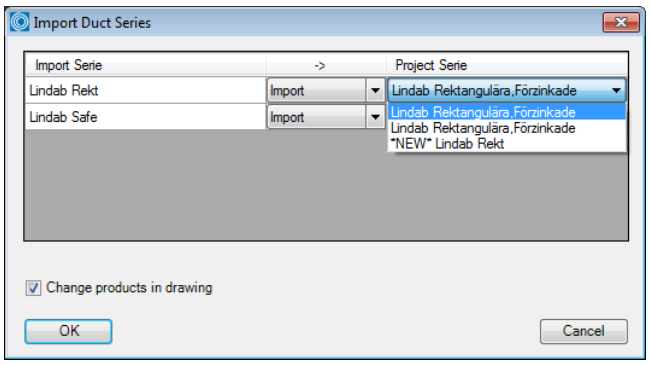
Import Duct Series

In MagiCAD you draw Duct Series after pre-defined templates. Setting up a Duct Series in MagiCAD with real products and prioritizing them correctly can be time consuming and contain errors which do n ot appear before creating a Bill-of Materials with the CADvent Plug-in.

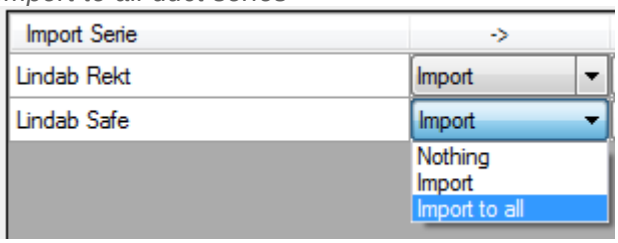
In order to simplify this for our customers they can import Lindab products into an existing Duct Series or create a new one for Lindab Safe ducts and for rectangular ducts.

With the function “Import to all” you can automatically attach Lindab products for air duct systems to all existing Duct Series in MagiCAD seperately for round ducts and for rectangular ducts.

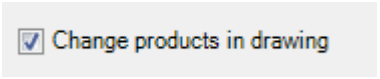
CADvent import Duct Series dialog box



Import to all duct series



Check “Change products in drawing” to convert existing generic objects in the drawing.

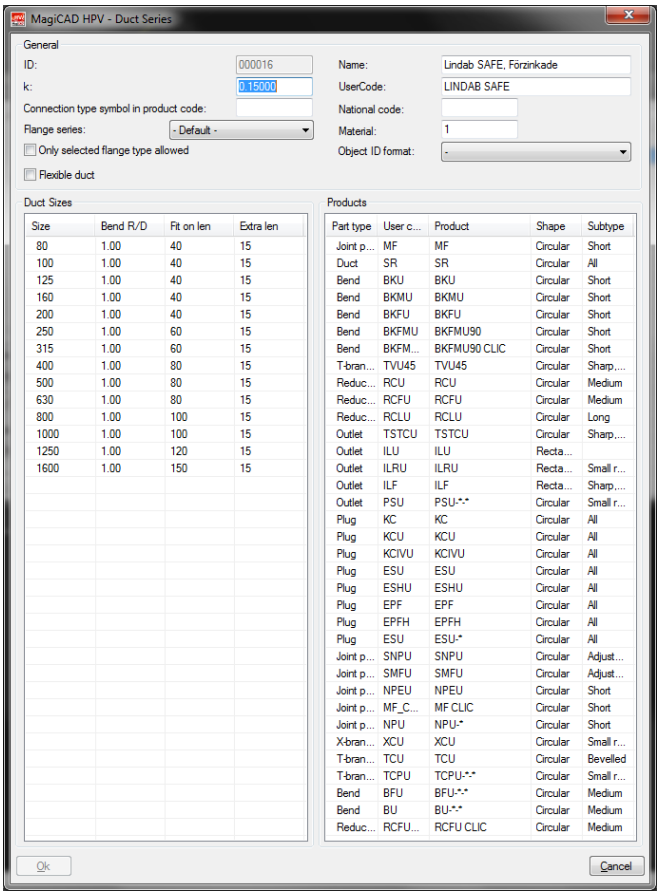


This way you draft automatically with “real” products which follow the standards for a Production Model similar as in CADvent.

NOTE:

Only these products can be shown correct on the BoM and can be ordered in the webshop!

Duct Series product selection dialog



Update Properties

The Update Properties command should be used after you have drawn your MagiCAD production model objects to add information.

When you are finished drafting or to update information in-between just push the Update Properties button, select a MagiCAD ventilation object and open the AutoCAD Properties as shown to the left.

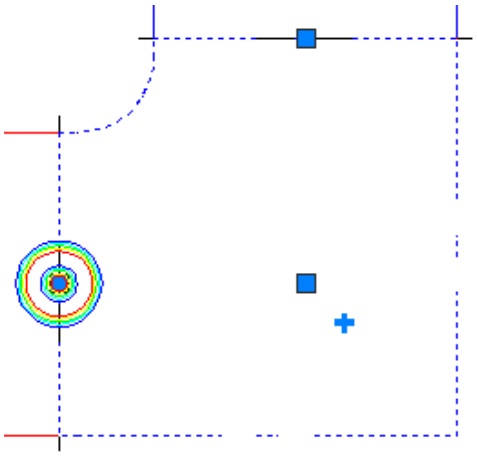
CADvent	
Custom String	
Material	Galvanized
PieceLabel	
PieceLabel Lock	Off
Order Length	
Flange Index	1
Flange Type	OTHER
Flange Attache...	Normal
Flange Lock	Off

CADvent Plug-in Properties

Parameters for Update Properties:

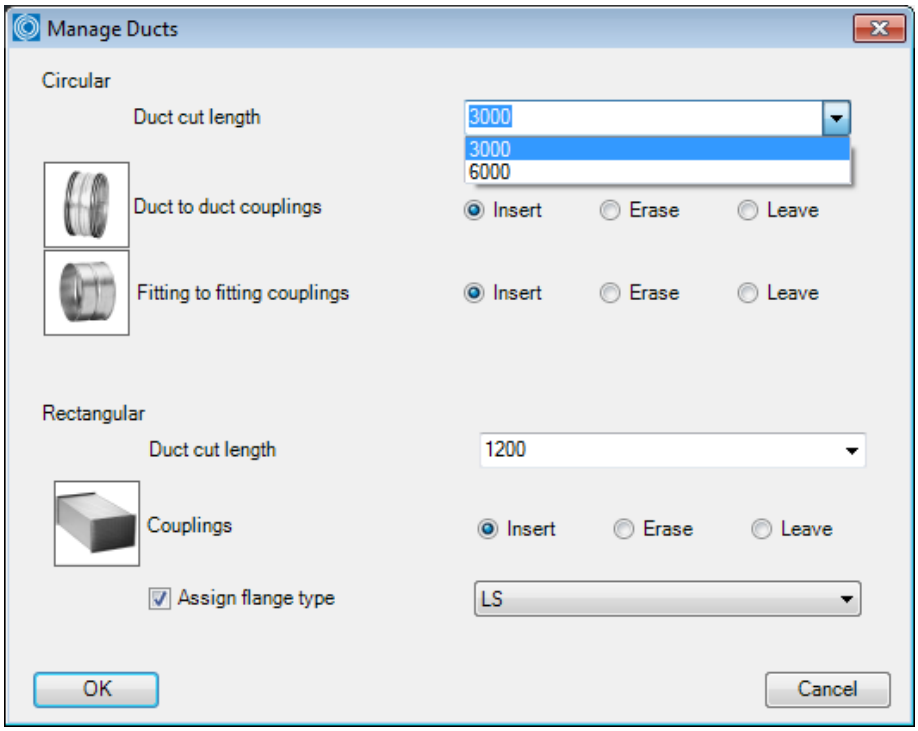
- Custom String: Allows you to set manually a text string which is shown in the **Bill-of-materials**.
- Material: Sets a material which is used in the **BoM** and necessary for product upload to the **LindabEshop**. Alternatively the material stated in the MagiCAD Duct Series can be used.
- Piece label: Gives a unique ID to each product.
- Piece label lock: Locks the ID you set manually. The ID will not get overwritten by the automatic **Piece label function** in the CADvent Plug-in.
- Order Length: Give a rectangular duct another length value manually to be able to cut the duct on site.
- Flange Index: Position of flange on an object. The Index is also marked per product in the drawing. By default “All” are selected and the marker is deactivated.
- Flange type: Select a standard flange type according to your market settings.
- Flange attachment: Set a flange type “Normal” or “Loose” if you want to be able to cut the duct on site.
- Flange lock: Lock the setting of this flange, then the CADvent Plug-in will not change the flange type or attachment using the **Manage Ducts** function

Flange Index mark in drawing



Manage Ducts

The **Manage Ducts** function allows you to cut ducts into standard lengths, set flange type and insert connectors automatically.



Manage Ducts dialog

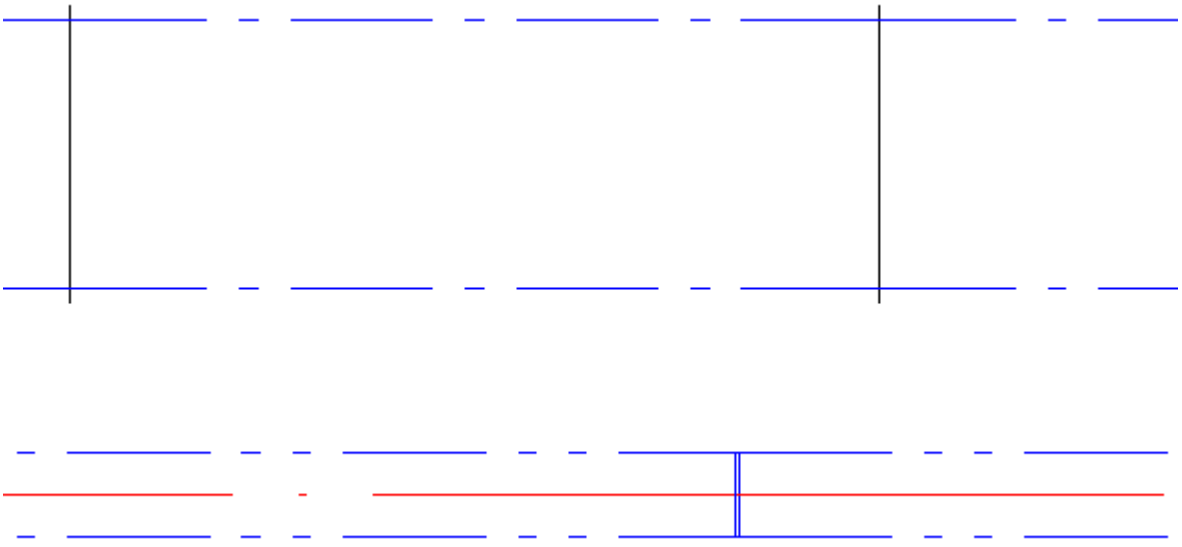
In the Round Selection you can set parameters to insert duct to duct and fitting to fitting couplings and select a standard length to cut round ducts into standard lengths. You can select a market dependant standard length or manually type a standard length.

The buttons **Insert**, **Erase** and **Leave** define whether you want to cut or re-cut the ducts (Insert), whether you want to remove existing duct cutting (Erase) or you want to leave the round duct cutting as is, f. ex. if you want to change only the rectangular settings.

In the Rectangular selection you have similar functions for duct cutting and insertion of flange types as in the round selection. In addition you also have a selection of

market specific flange types and a check button to assign the selected flange type to the rectangular ductwork.

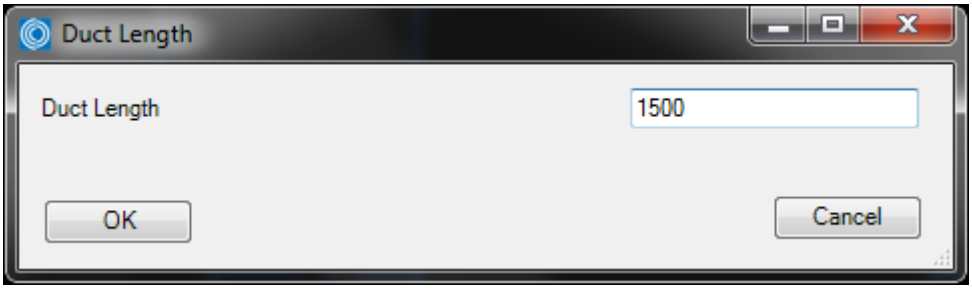
Now you can select the products to be cut by dragging a window or press right mouse click or Return/Enter to select all products in the drawing.



Round and rectangular ducts with inserted flanges and connectors

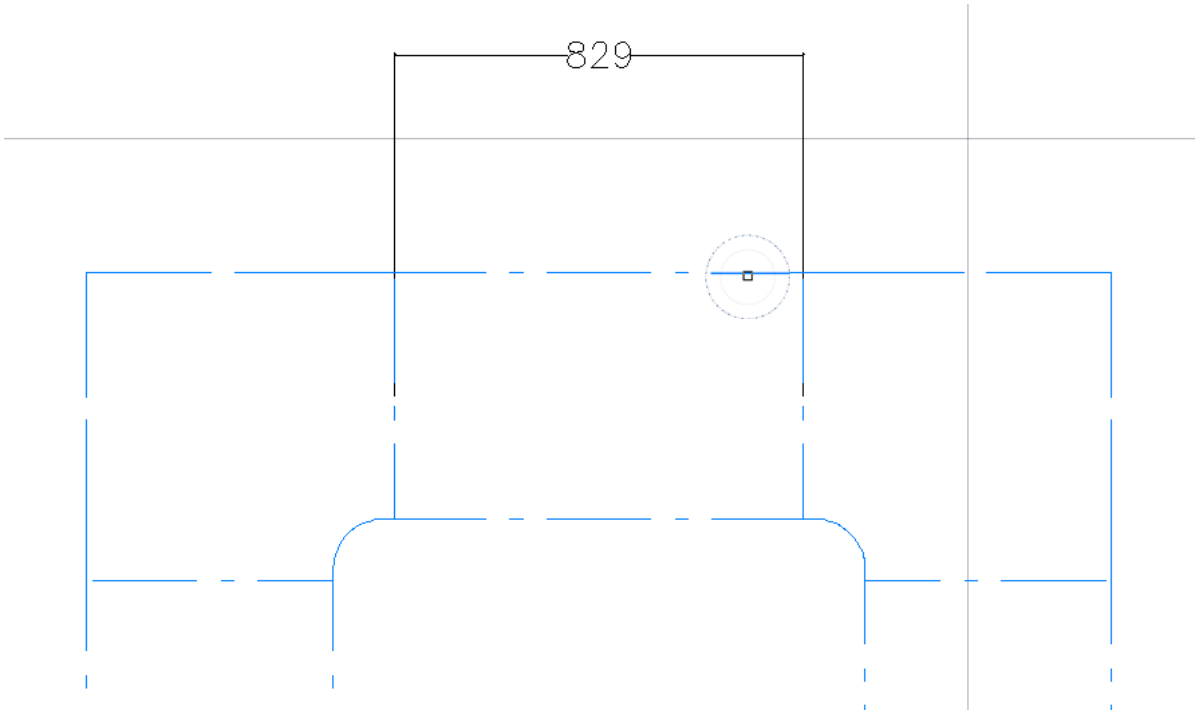
Set Length

The **Set Length** command shorten or stretches the length of a duct to a user given length, just click on the command button, enter the length value in the below shown dialog and select duct you want to set:

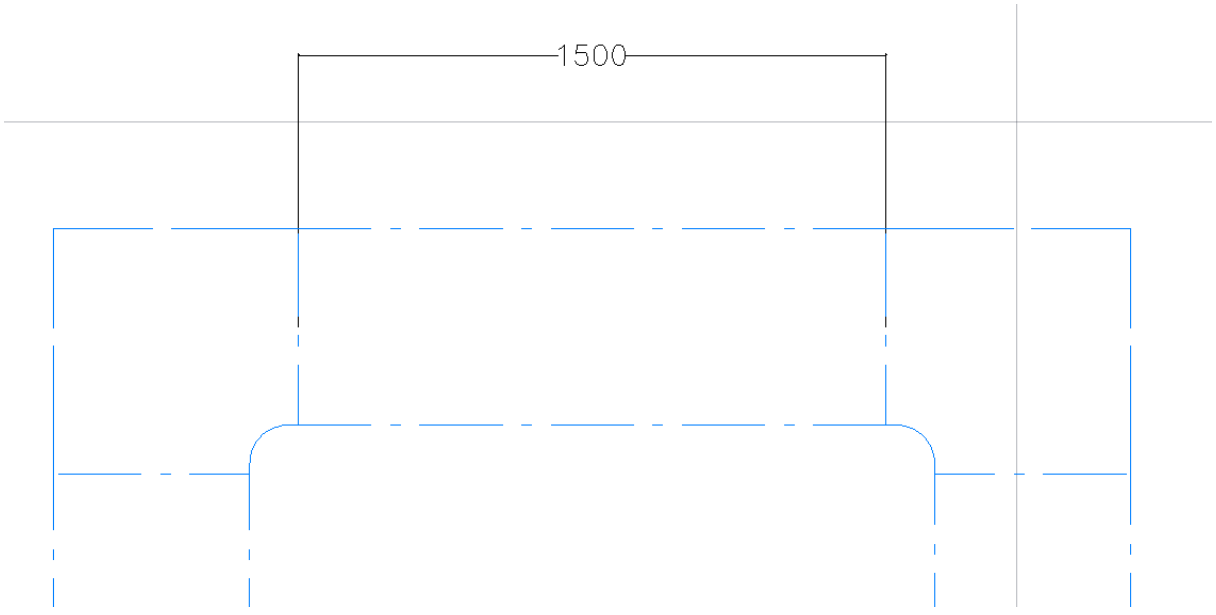


Set Length dialog

Depending on where you click on the duct, the opposite end will be stretched/ shortened:



Set Length dialog with fixed end on right side before stretchening

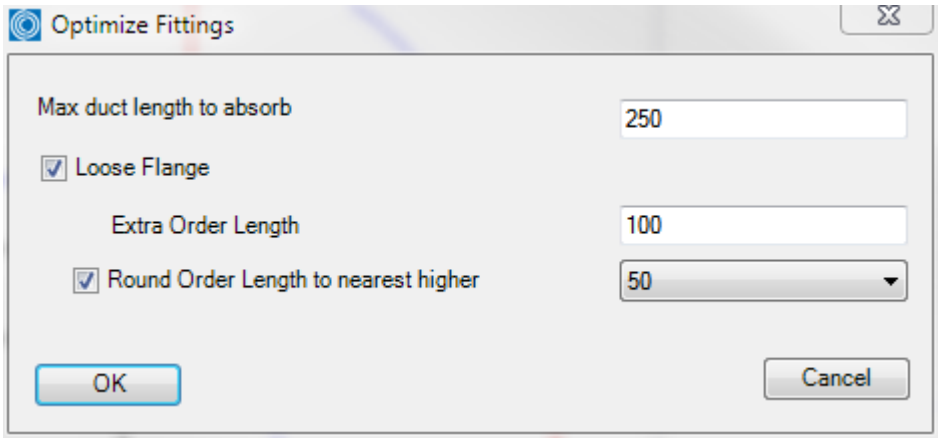


Set Length dialog with fixed end on right side after stretching

NOTE: The Set Length command has a restriction: if the movement should interfere with MagiCAD safety functions, then the command is not executed.

Optimize Fittings

The **Optimize Fittings** function checks the drawing for short rectangular duct pieces to “absorb” them into the leg length of a fitting to minimize product and installation costs.



Optimize fittings set length dialog

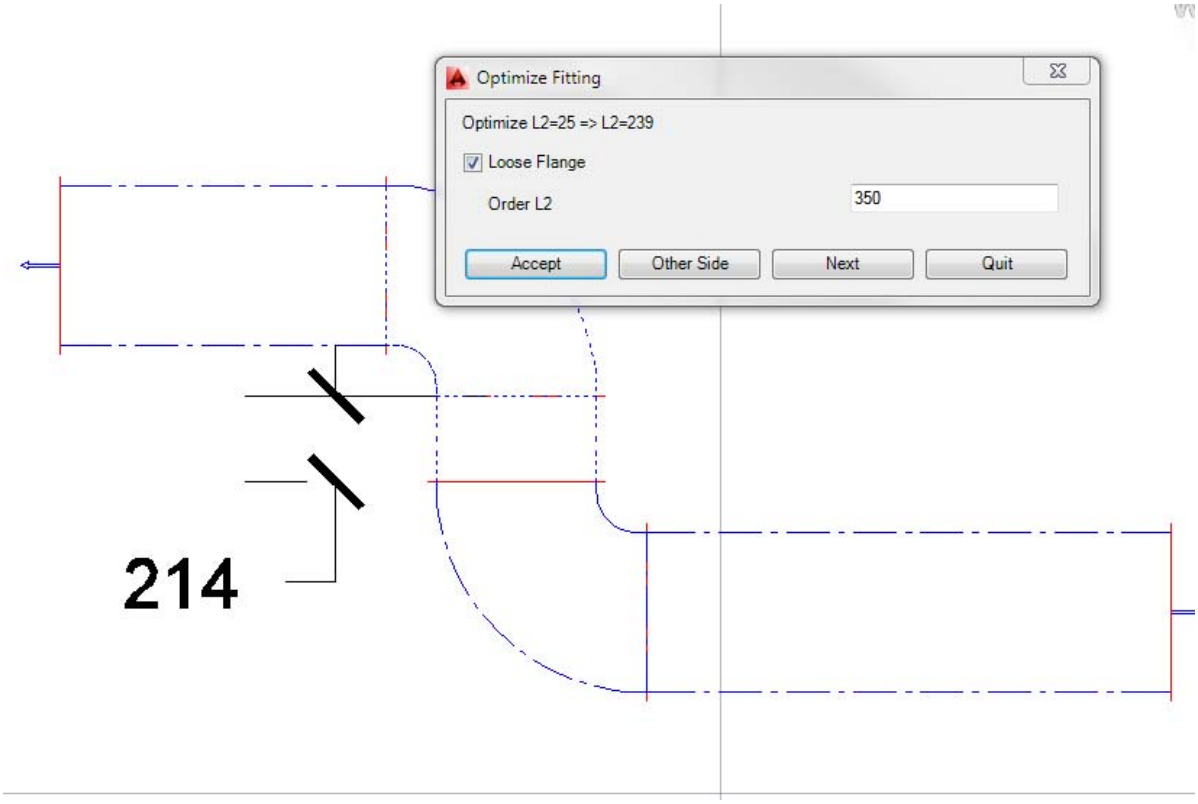
Enter the maximum length which should be optimized and push “Ok”. The CADvent Plug-in will check the drawing for short ducts and open a dialog for each duct that is found.

Loose Flange will add a loose flange information to the prolonged leg of the fitting as default. It is always possible to add a loose flange on each optimization manually if the option has not been activated when the command has been started.

Extra Order Length: Adds a certain length to the fitting leg, used to cover tolerances on building site.

Round Order Length to nearest higher: Makes the order of components smarter. You can choose a round up value of 50 or 100.

Sample:

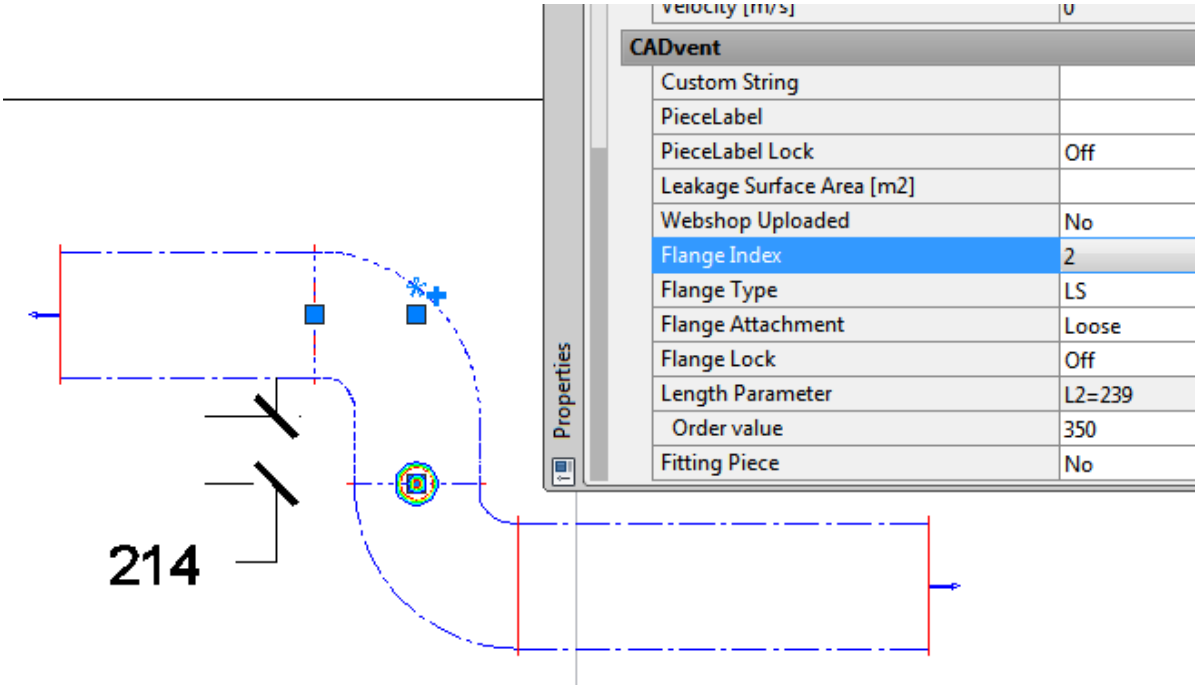


Absorb short pieces of duct to fitting

The duct and fitting which shall be optimized will be shown with dashed outlines. Press “Accept” to execute the optimization or “Other Side” (only possible when the duct is between two fittings as shown above) to switch the optimization to the other side.

The current fitting is made with a 25mm standard leg length. After optimization, following leg length will be activated at the fitting:

Not activated Loose Flange option:	239mm (= 214mm + 25mm)
Activated Loose Flange option and extra order length of 100mm:	339mm (= 239 + 100mm)
Round order Length to nearest higher 50mm:	350mm
Round order Length to nearest higher 100mm:	400mm



Short duct piece absorbed to bend

The properties of the fitting can be visualized in AutoCAD Properties. Activate the flange Index to show the properties of each connection side separately and activate the connection point with the prolonged leg.

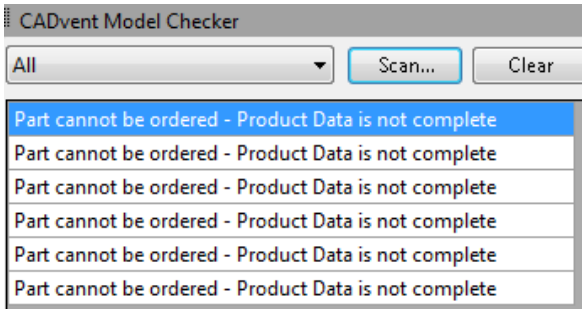
Model Checker

The **Model Checker** is a function that controls all ventilation objects in a drawing if they fulfil the demands for the **CADvent Production Model**.

This function is essential to check whether all products can be shown in the **BoM** and can be uploaded in to the **LindabEshop**.

The Model Checker checks following details:

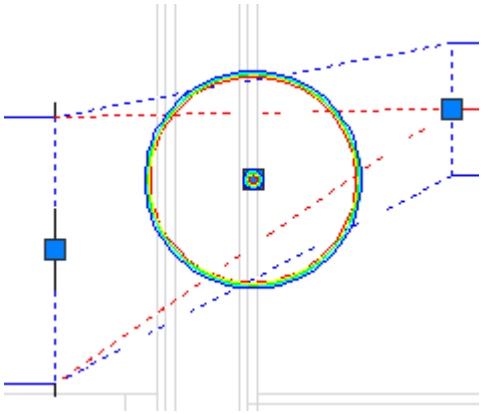
- Generic object that cannot be ordered.
- Order parameter is less than drawing parameter.
- Duct length is longer than cut length
- Space without name



CADvent Model Checker Dashboard

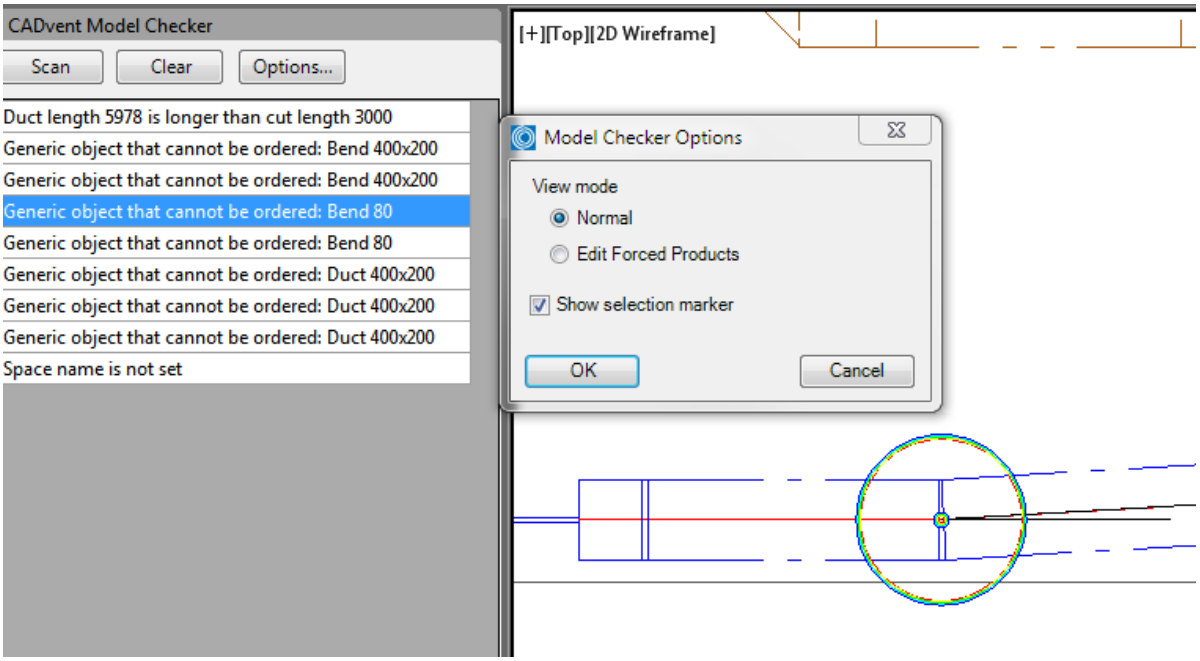
Push the Model Check button to open an AutoCAD Dashboard on the side of your screen and push the “Scan” button to check the drawing for products which can’t be ordered.

Click on one of the parts to move the object into scope and mark it.



Non production model object marked with Model Checker

The marking can be shut off in the Dashboard – Options...

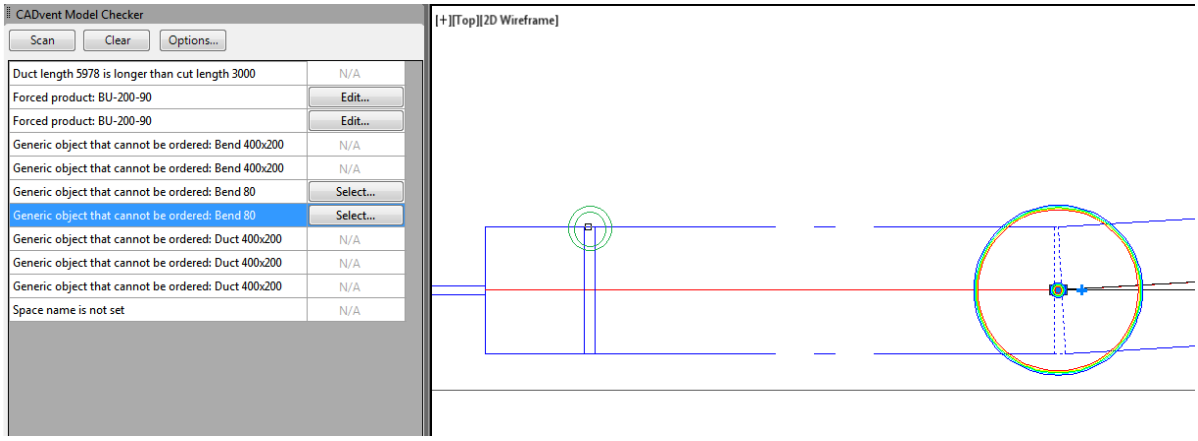


Model Checker Dashboard with marker function

Edit Forced Products

Activate this option if you like to force products to be another type of product. The image below shows a bend with a 3° angle, which is a not existing product. On building side this can be handled inside the tolerances of a duct connector NPU.

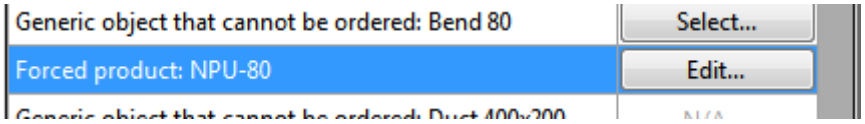
Activate *Edit Forced Products* opens an edit column in the model checker table.



Product with the possibility to be a forced product get the option *Select…*

To use this function, the product to copy the properties from, has to be available on the drawing!

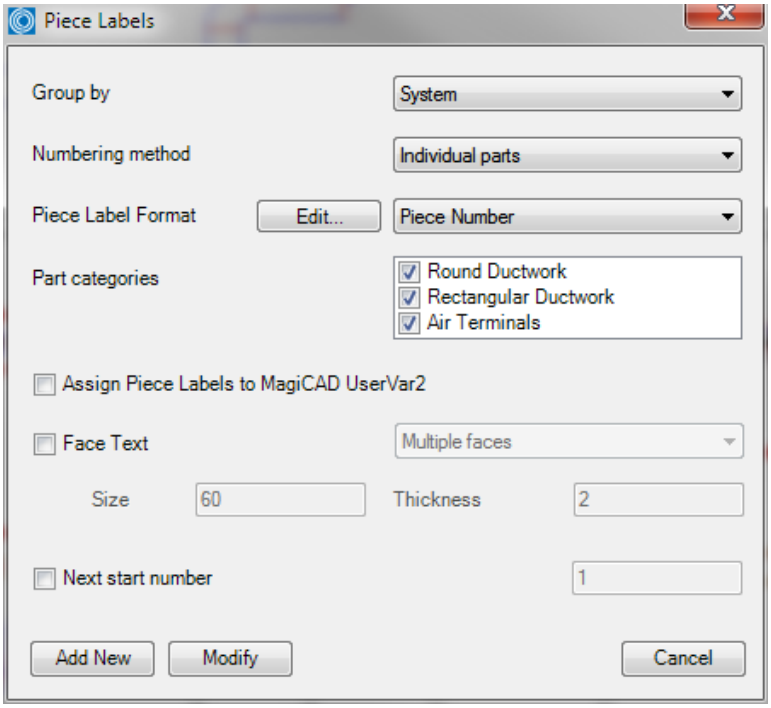
Mark the product in the *Model Checker*, press *Select…*, select the product the generic object is forced to be.



Piece Labels

The Piece Labels function allows you to assign a unique identifier to each product or to group several products with similar identifiers using a running index of numbers.

You have different parameters to group and number products and to show the text of the identifier in the drawing and the report:



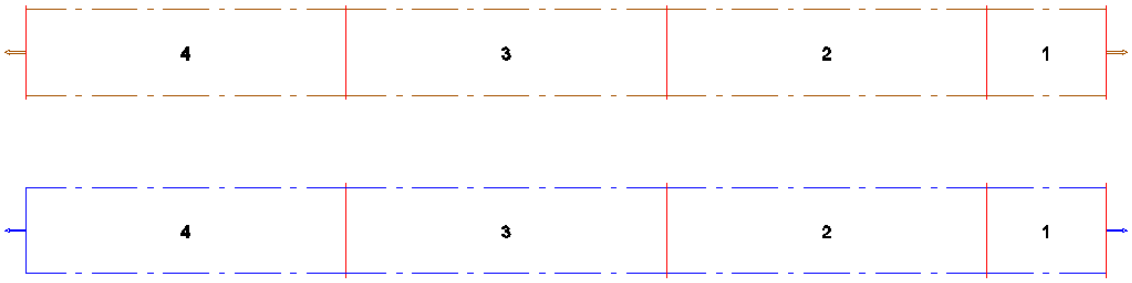
Piece Labels dialog

Group by:

You can group the numbers by system or select no grouping at all. When using no grouping all parts will get individual numbers in the piece label. When you group the piece by label by system you can have a single number per system, this means that you start again with number “1” on each system.

NOTE: Each system cannot have more than one open end on a duct as this will be used as start for the system. If you have more than one open end a warning will be shown:

None	The piece number will only follow the numbering method and does not care the grouping.
System	Each system will get an own numbering

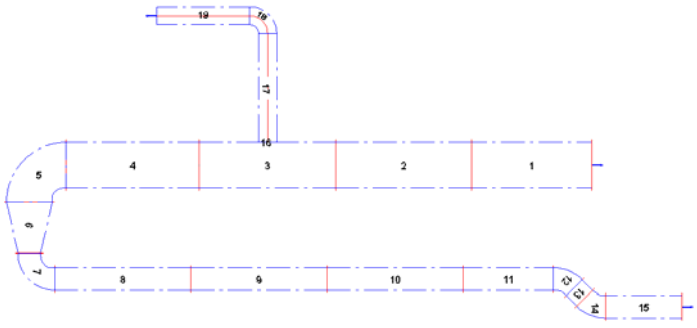


Sample: numbering grouped by system

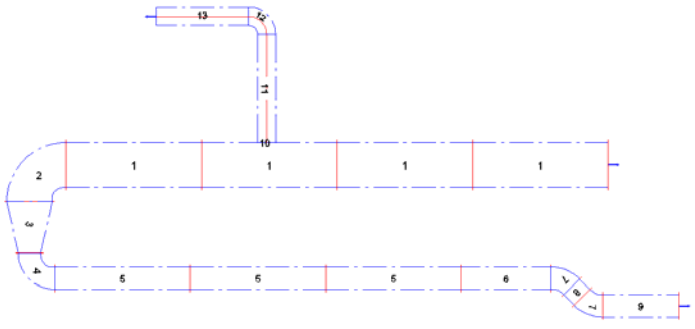
Numbering method:

The numbering method decides what number will be given to the individual component:

Individual parts — Each component will get an individual number

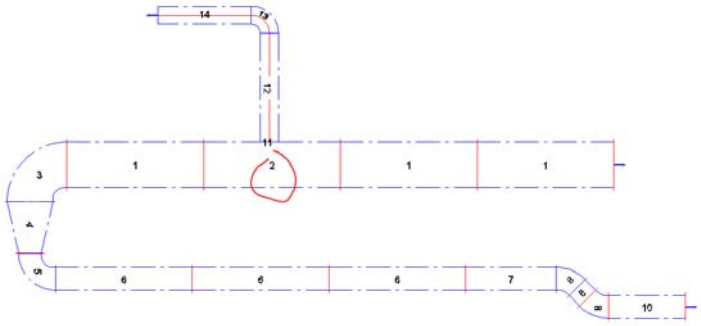


Product code + Material: Products with identical product codes and identical material will get the same number



Product code + Material /Holed Duct

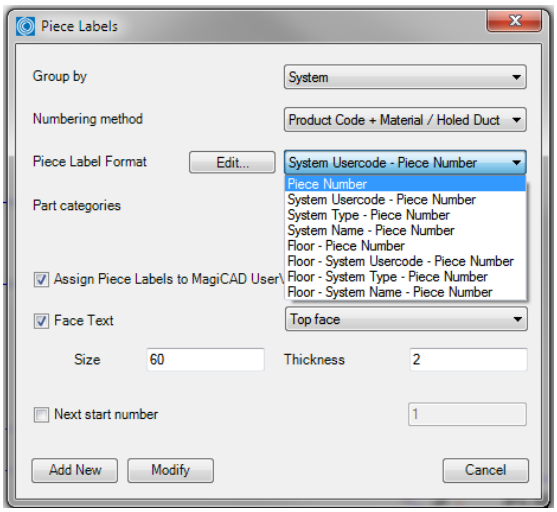
Same like before, but ducts with a hole inside, e.g. for grills or branches, will get an individual number.



Piece label format:

A piece label can be an individual number (Piece Number) or a code that is build out of several informations.

The format of the piece label can be selected in the drop down menu of the Piece label Format



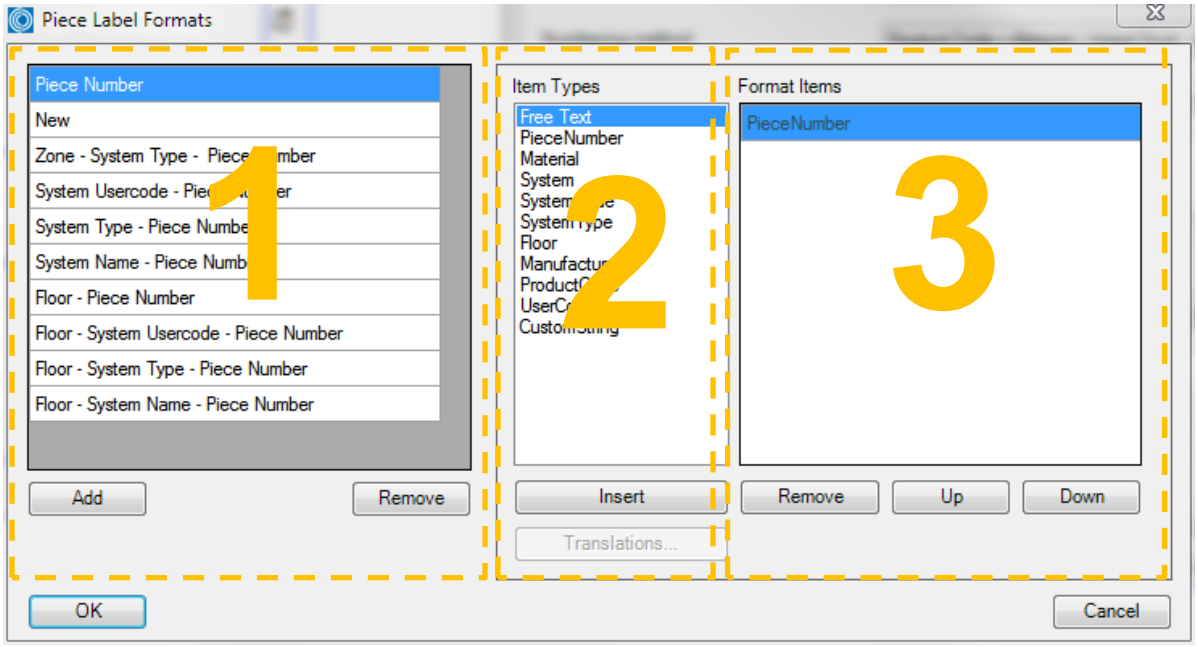
Piece label format selection menu

Edit:

The Edit function allows you to select Piece Label Formats and to edit the information you show in the piece label.

Press Edit… and the Piece Label Format window opens.

The window is structured into 3 parts:



Piece Label Format dialog

Part 1: Piece label Formats – here you can find and safe your piece label formats.

Part 2: Item Types – Variables you can use to create your piece label

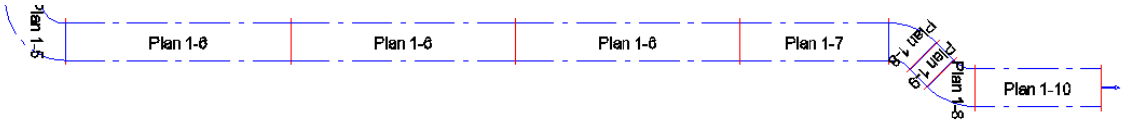
Part 3: Format Items – This is the editor area to build Piece labels

If you push the “Add” button you can create new formats. By double-clicking on an “Item Type” the value will be attached to the editor, so you can create your own piece labels.

The “Up” and “Down” buttons allow you to change the sorting of the piece label items.

Sample:

Piece label template “Floor – Piece number”



Translations

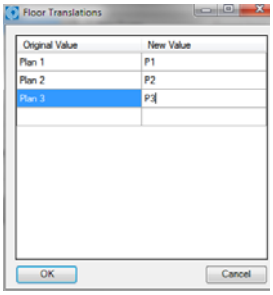
The button “Translations” allows the user to add specific data or values to be shown in the piece label item.

Mark an Item Type and press *Translation*

NOTE: For certain items – Material, System, SystemCode, SystemType and Floor - the CADvent plugin reads the existing information from the MagiCAD project.

Just click into the field for “Original value” and select one of the listed values or type your own.

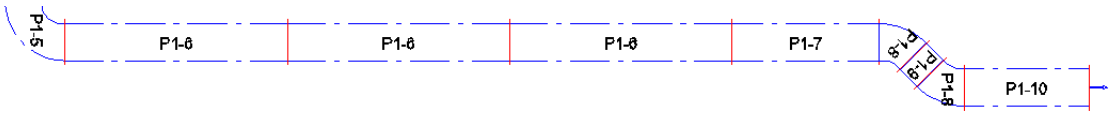
New values like a new system will NOT be created as new system in MagiCAD!



Translations dialog

Sample:

Piece label template “Floor – Piece number” with above “Floor Translation”



Part categories

You can select to which product types you want to assign a piece-label by selecting/deselecting the three product groups Round Ductwork, Rectangular Ductwork and Air Terminals.

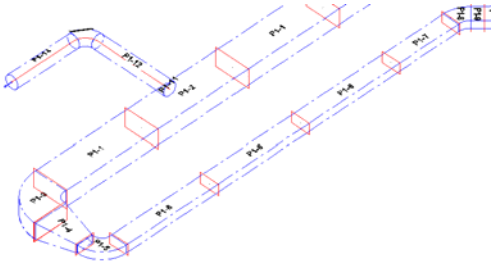
Assign Piece Labels to MagiCAD UserVar2

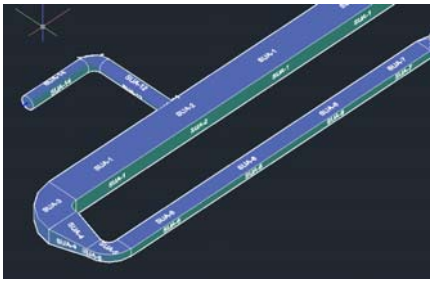
If you mark the check button for “Assign Piece Labels to MagiCAD UserVar2” they can also be shown in the drawing by texting objects with the MagiCAD User Variable 2.

Face Text

The Piece labels can be visualized in the drawing with a Face Text. You can chose between two options:

Top Face	Required for 2D and wireframe visualizations
Multiple Faces	Required for 3D shaded visualization





2D Wireframe visualization with Top Face Piece labels and conceptual visualization with Multiple Faces labels

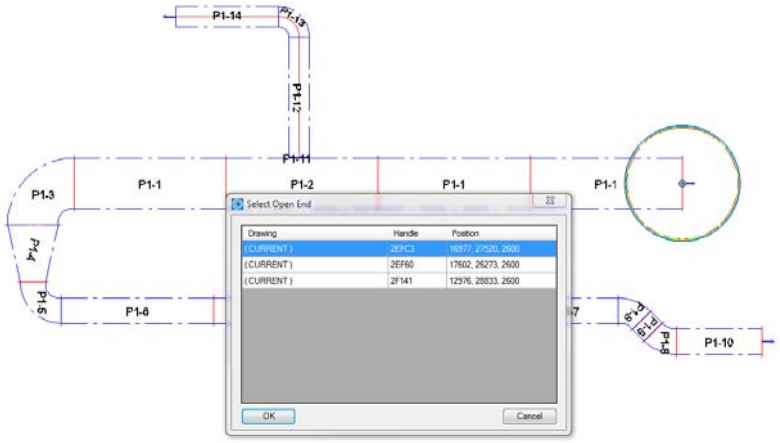
Next start number

Next start number allows the user to select a self-defined start number for the numbering.

Note: The given number is used as minimum number. Does the given number already exist in the drawing, CADvent will choose the next free number!

Add New

Press the Add New button to start the piece label process. Click on a part of the system you like to label. If the system you like to label contains more than one open end, all open ends will be visualized in a table and marked with a circle. Select the open end where the labeling shall start.

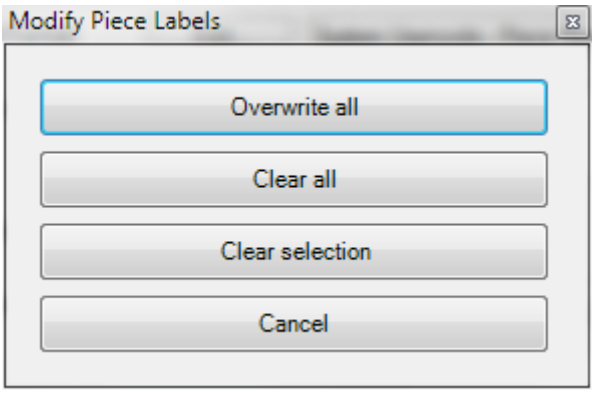


Visualization of multiple open ends to select where to start the piece labeling

Note: Add New changes not already created numbers. Once a system is numbered Add New can be used to add new components to be provided with new numbers.

Modify Piece labels

To modify existing piece labels press Modify. A window with different options appears:



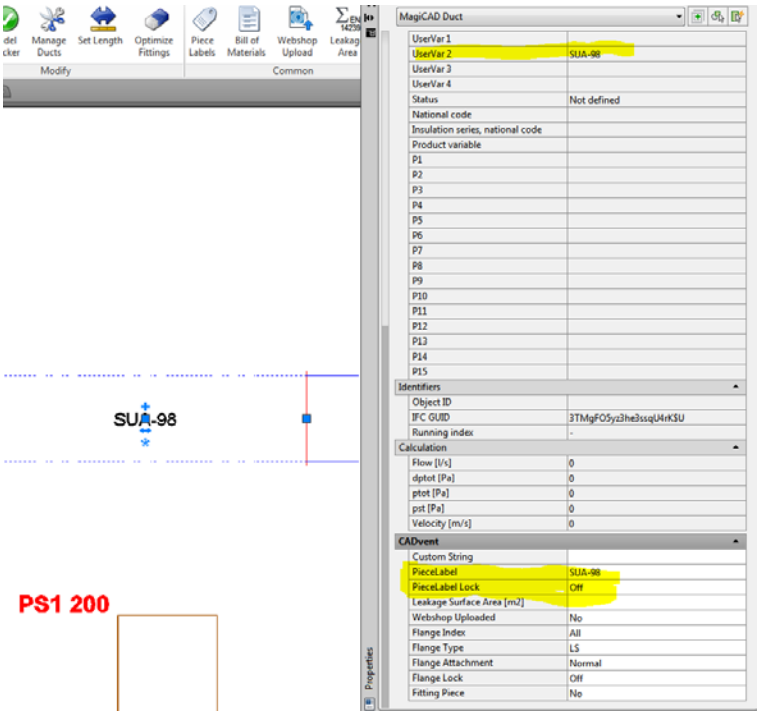
Modify options

Overwrite all	Deletes all Piece Labels and creates immediately a new piece labeling for all components of the selected system. Hereby the next selected Piece Number is the next free number after the highest used number.

Clear all	Deletes the Piece Labels for all components of the selected system
Clear selection	Deletes the Piece Label only for selected components

Properties

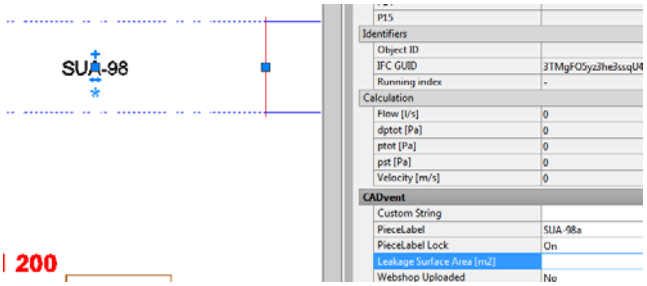
By the AutoCAD property dashboard you can find the piece label within the CADvent area. If you have selected the option *Assign Piece Labels to MagiCAD UserVar2* you can find the piece label also listed in the MagiCAD informations.



Manually changes of the Piece label.

Changing the piece label manually is possible inside the CADvent area of the properties.

1. Change the PieceLabel text
2. Active the PieceLabelLock (ON) to secure, that the automatical piece labeling does not overwrites your text.



3. Activate the CADvent piece label function and press Add New

This will change the visualized piece label and writes the manual given text to the MagiCAD UserVar 2

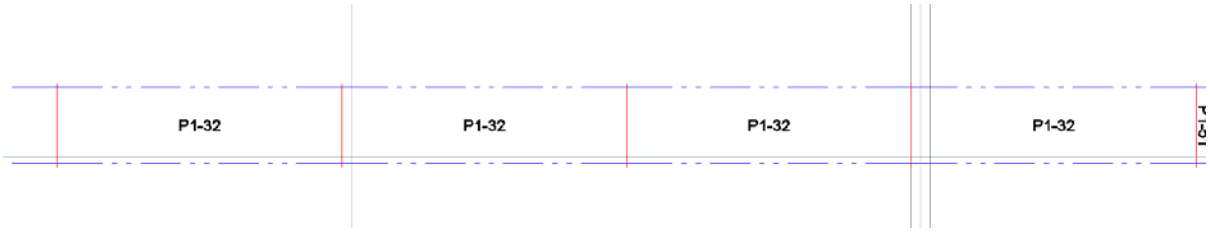
Changes of the system

Changes in the system need almost an update of the piece labels. As soon as order processes have already been started, changes of existing piece labels are taboo.

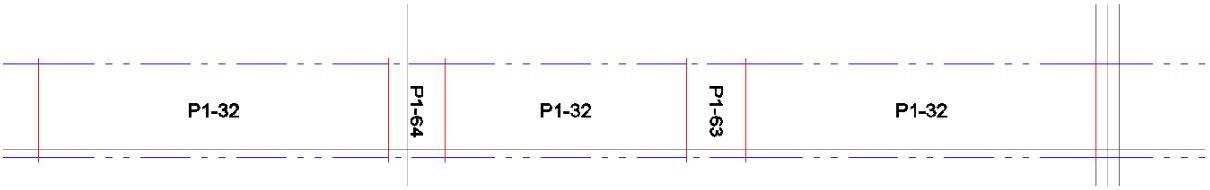
How to handle changes in the system:

Sample:

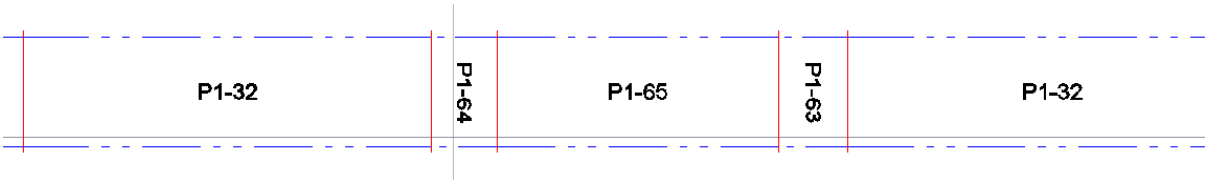
Below you can see a duct system with final piece label



After the order process has already been started the middle duct shall be set a few cm down, to give some space for heating pipes. As long as the same ducts are used, the piece label will not change, not even when the duct length has been changed.

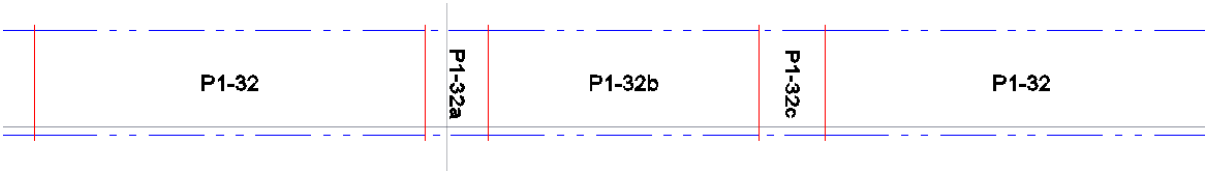


For situations like this, you have to use the modify option *Clear Selection* to delete the piece label of the changed duct and use Add New for this system. The new components will get a new piece label. The next free number from the highest existing will be used.



OR

You change the piece label manually. The sample shows a labeling according to the previous number with additional letters.

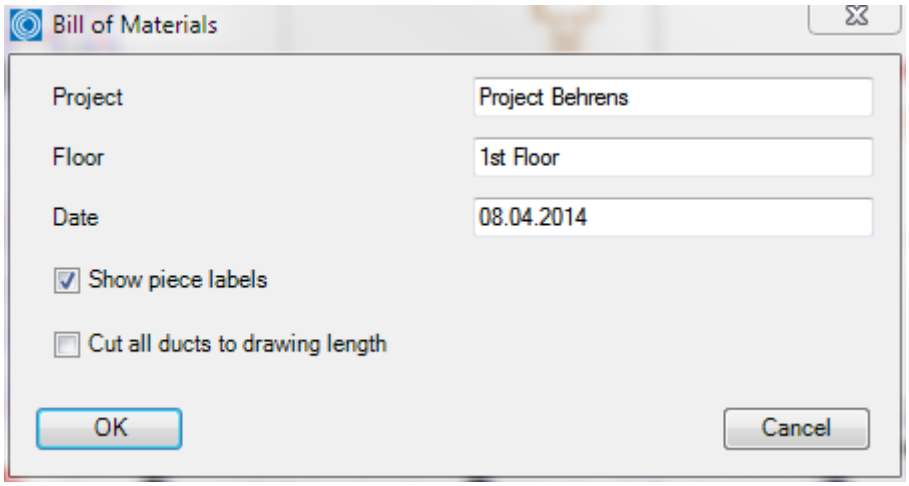


Bill of Materials

Push the button for Bill of Materials and drag a window over the Lindab products which shall be included on the BoM reports.

Two reports will appear: One report for the rectangular ducts and another report for circular ducts and technical components.

You can decide whether you want to show the piece-label on the report or if you want to suppress it by checking/unchecking the show piece-label function



Dialog for Bill-of-Materials

Cut all ducts to drawing length

Without active checkbox the BoM will summarize all round ducts into standard lengths, set in the Manage Ducts command, except the drawn ducts will have a length of 3000 or 6000mm (Lindab Standard)

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CADvent Plugin 1.0.51 for MagiCAD

Stykliste

Projekt	Test MagiCAD
Afsnit	1st floor
Dato	2011-05-24

LKR	Pos. nr.	Antal	a	b	h	l						flange 1	flange 2	flange 3	
	6	1	600	400	400	800						LS LOOSE	LS LOOSE		
	14	1	600	400	400	978						LS	LS		

ILRU	Pos. nr.	Antal	l	r	s							flange 1	flange 2	flange 3	
	7	1	25	25	0							LS			
		1	25	25	0							OTHER			

LBR	Pos. nr.	Antal	a	a1	a2	angle	b	l1	l2	r	s	flange 1	flange 2	flange 3
		1	90	400	400	90	250	25	25	100		LS	LS	
		1	90	400	400	90	250	25	279	100		LS	LS	
	17	1	90	500	500	90	250	287	25	100		LS	LS	
		1	90	600	600	90	400	25	25	100		LS	OTHER	
	5	3	90	600	600	90	400	25	25	100		LS	LS	

LDR	Pos. nr.	Antal	a	b	c	d	e	f	h	l	l1	flange 1	flange 2	flange 3
	19	1	500	250	400	150	0	0	50	450		LS	LS	
	15	1	600	400	500	250	-50	50	75	450		LS	LS	

Rectangular Report:

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CADvent Plugin 1.0.51 for MagiCA

Stykliste

Projekt	Test MagiCAD
Afsnit	1st floor
Dato	2011-05-24

Type / Producent / Materiale	Produktkode	Pos. nr.	Antal
Kanaler			
Lindab			
Galvanized			
	SR-160-3000		2
	SR-200-3000	7	3
	SR-250-3000		2
	SR-315-3000	3	5
Andet			
GENERIC			
Galvanized			
	GENERIC Fitting 400x250 / 400x250 / 300x200		1
	GENERIC Reducer 160 / 200		1
	GENERIC Reducer 160 / 250		1

Circular report and technical components:

Products which are not following the rules for a production model are listed with their connection information and type as generic objects.

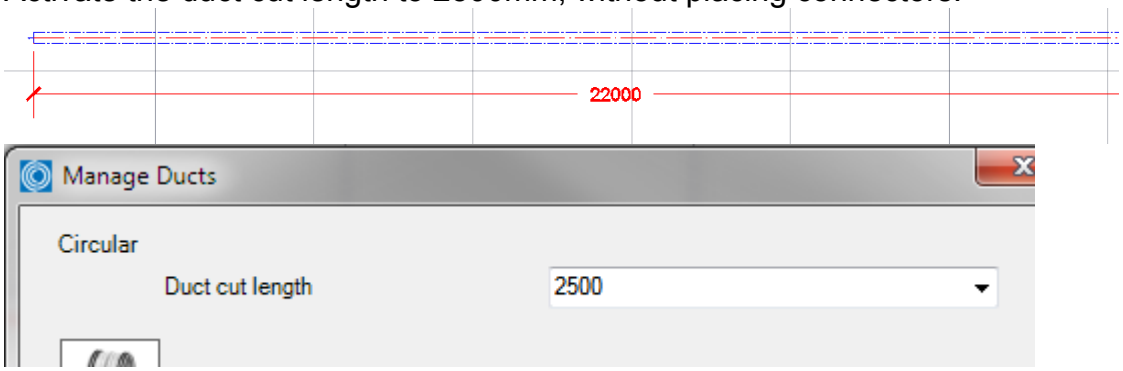
The reports can be exported as PDF or to Excel.

Lengths on BoM

Without active checkbox the BoM will summarize all round ducts into standard lengths, set in the Manage Ducts command, except the drawn ducts will have a length of 3000 or 6000mm (Lindab Standard)

Sample 1:

1. Draw a 22m long duct
2. Activate the duct cut length to 2500mm, without placing connectors.



3. Result on Bill of Materials.

Lindab		
galv. Metal		
	SR-200-2500	9

The material list summarizes all ducts per size and divides the total length into 2500mm pieces.

Sample 2:

1. Do the same process like above and activate a Duct cut length of 3000mm
2. Insert connectors.
3. Change the Duct cut length to 2500 mm without inserting any connector.

4. Result on Bill of Materials

Lindab

galv. Metal

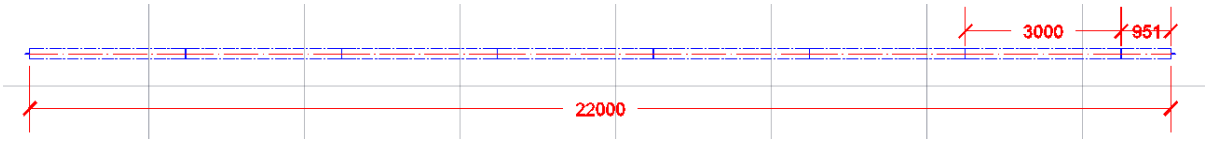
SR-200-2500	1
SR-200-3000	7

Lindab

galv. Metal

NPU-200	7

The material list summarizes all ducts per size and divides the total length into 2500mm pieces, except all pieces with 3000 and 6000mm, these will be listed separately.



Note: The division of the lengths in standard and special lengths does only work with 3000 and 6000mm lengths.

Sample 3:

1. Do the same process like above and activate a Duct cut length of 2000mm
2. Insert connectors.
3. Change the Duct cut length to 2500 mm without inserting any connector.
4. Result on Bill of Materials

Lindab

galv. Metal

SR-200-2500	9

Lindab

galv. Metal

NPU-200	10

The material list summarizes all ducts per size and divides the total length into 2500mm pieces, except all pieces with 3000 and 6000mm, these will be listed separately. In the last sample we do not have 3 or 6m ducts, only 2m ducts.

Note: The BoM process does not read the "real" duct lengths, except for 3 and 6m long ducts, therefore the 2m splitting has no effect on the order list for ducts, but it has direct effect on the amount of connectors!

Cut all ducts to drawing length

This options will list ALL real duct length on the BoM.

BoM from Sample 1:

Lindab		
galv. Metal		
	SR-200-22000	1

BoM from Sample 2:

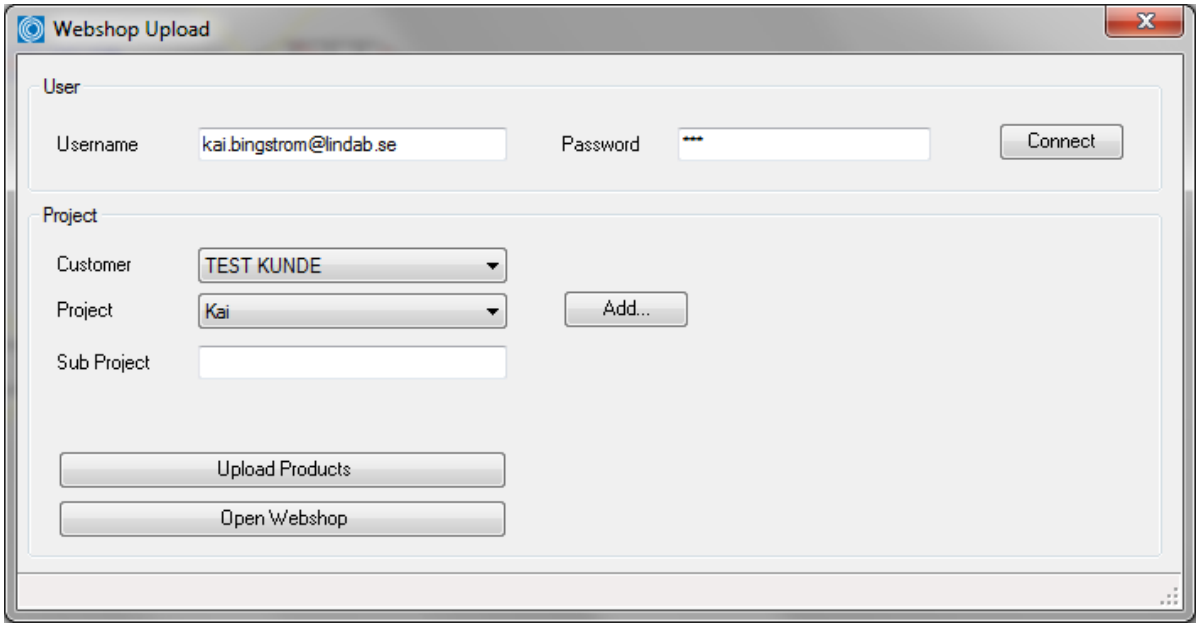
Lindab		
galv. Metal		
	SR-200-3000	7
	SR-200-951	1
Lindab		
galv. Metal		
	NPU-200	7

BoM from Sample 3:

Lindab		
galv. Metal		
	SR-200-1930	1
	SR-200-2000	10
Lindab		
galv. Metal		
	NPU-200	10

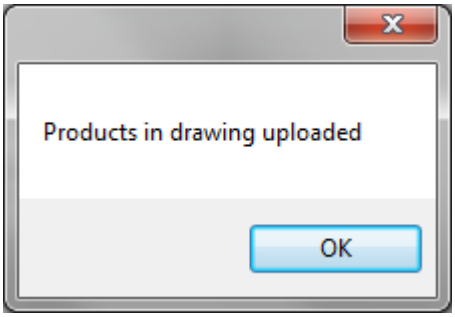
Webshop Upload

The webshop upload is currently only available for Danish customers with access to Lindabs new Eshop. Push the button and select the products which you want to upload, then a login dialog wil open where you should enter your username and password, them push “Connect”:



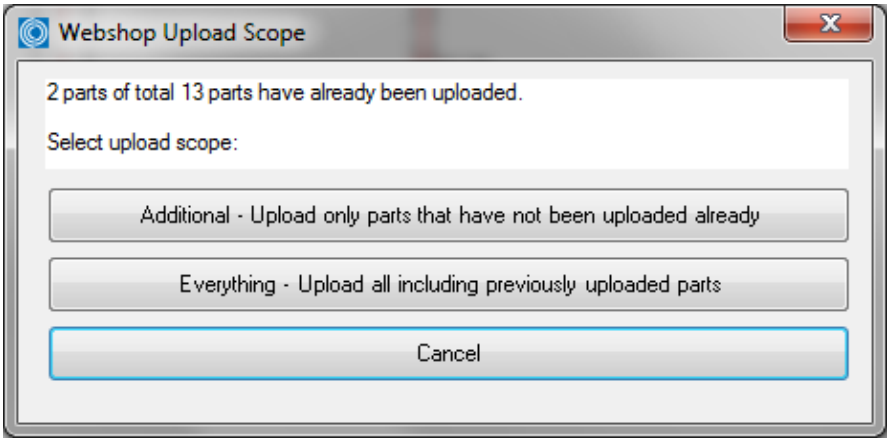
Dialog for Lindabs Eshop Upload

Select “Customer” and “Project” or create a new project using the “Add” button. Then type the name of the Sub project and push “Upload Products”. A new dialog will appear showing that the transaction was successful:



Upload OK dialog for Lindab Eshop

Push the button “Open Webshop” to open Lindab Eshop your web browser. In case of several uploads it can happen that you pick already uploaded objects which will be shown in a dialog.

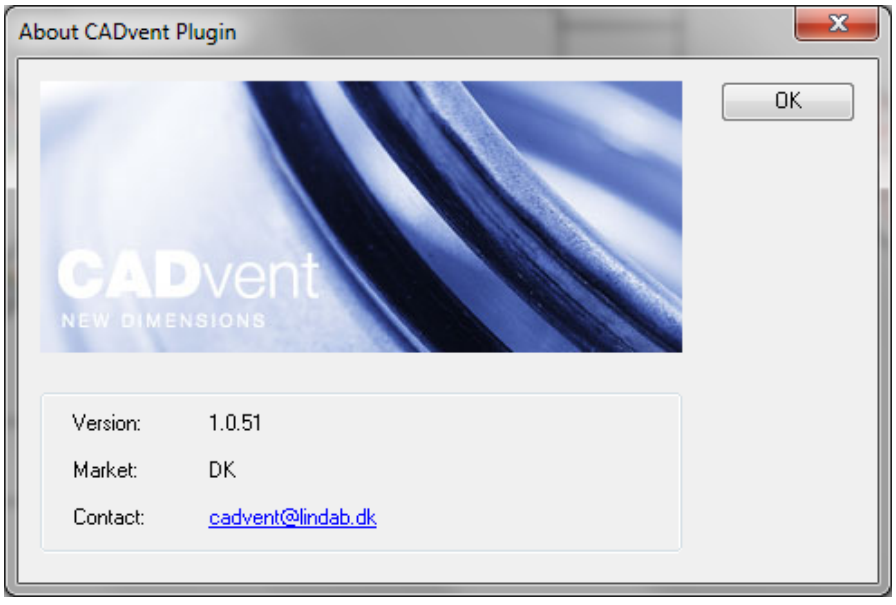


Mulitple product upload dialog

You can then upload only additional products which have not been uploaded before, all products again or cancel the upload procedure.

About

In the About button you can find information regarding version number of the CADvent plug-in, which market is installed and contact information for technical assistance.



CADvent plugin About dialog

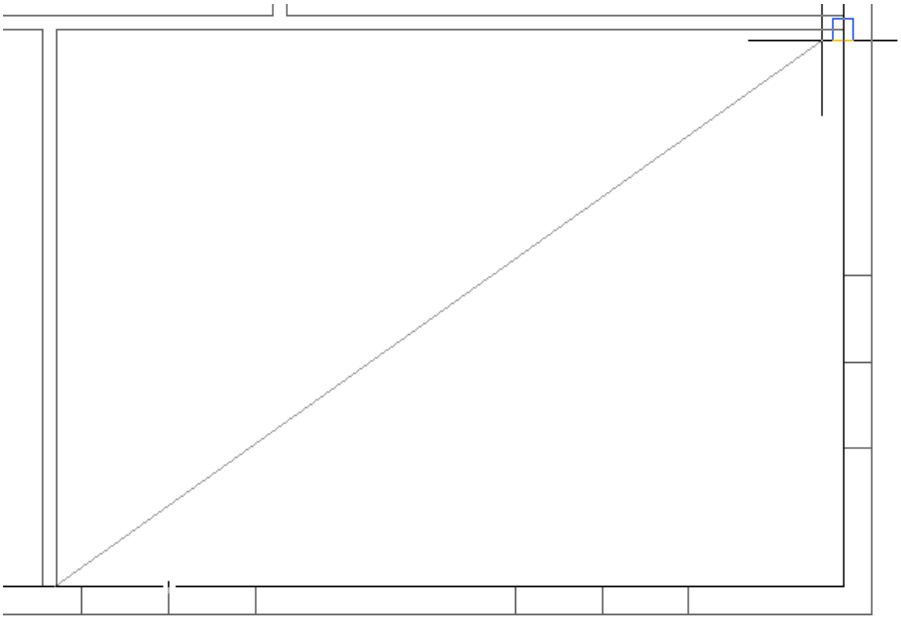
Add Space

The 3D Space element gives the user the possibility to create 3D objects in the drawing to create zones. The zones can be created as simple rectangular boxes (default) or as Polylines (Type P in the command Line, or activate Polyline on the right click menu) to create zones which follow the architecture.

The Space object allows the user to divide the drawing into several rooms or zones which can be uploaded to LindQST, the Lindab Quick Selection Tool, for selecting and calculating water and air products.

Rectangular rooms:

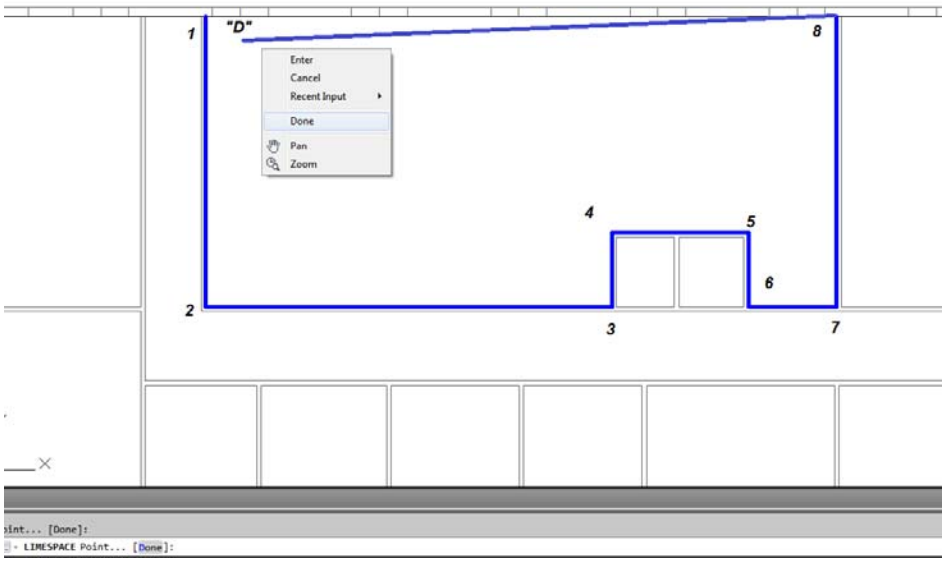
- Activate the *Add Space* command.
- Click on one edge of the room
- Click on the opposite edge of the room



Define a rectangular space object

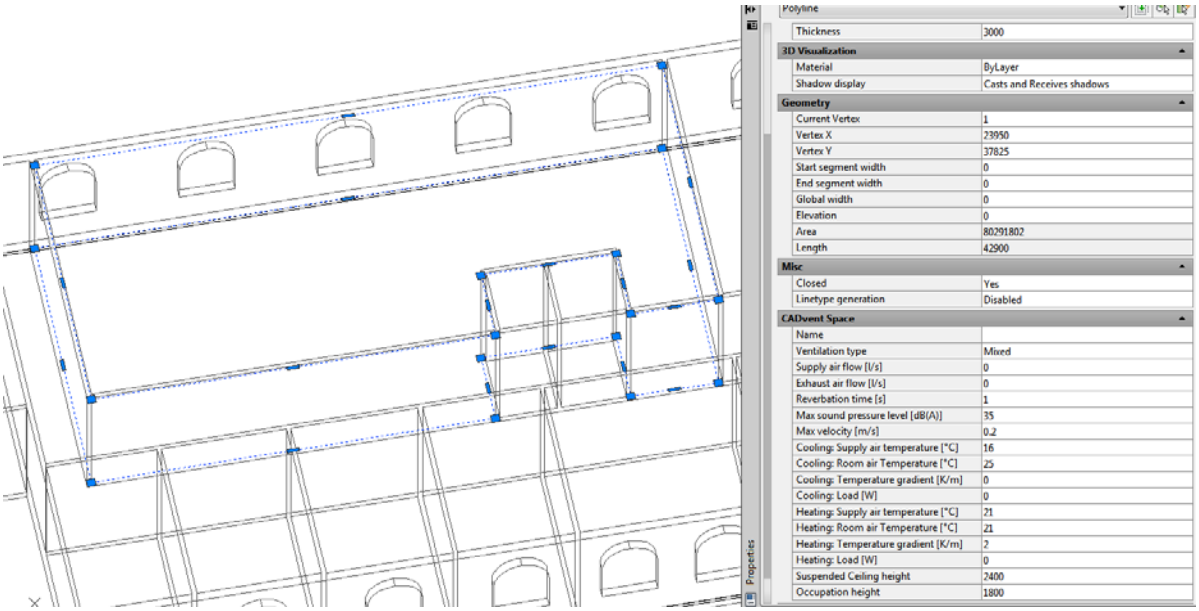
Non rectangular room:

- Activate the *Add Space* command.
- Type P in the command line to activate the polyline command
- Click on one edge of the room
- Follow the walls of the room, by clicking on each edge
- Stop at the last edge and type D (done) to close the Polyline



Define a non-rectangular space object

When you have created a zone you can change the parameter in the AutoCAD Properties to define the requirements for the room.



CADvent Space in drawing with AutoCAD properties

Thickness:	Height of the space object
Name:	Name of the Room/ Zone (**required**)
Ventilation Type:	Mixed, Displacement or Chilled Beams
Supply and Exhaust air flow in l/s:	Total air volume for this room/space

Reverberation time in s:	Sound reverberation time
Max. sound pressure level in dB(A):	Max allowed sound level in the occupied zone
Max. velocity in m/s:	Allowed average air velocity in the occupied zone
Occupation distance:	Max. distance from displacement unit where the air velocity is allowed to prevail
Cool./Heat. Supply air temp. in °C:	Temperature of the supply air
Cool./Heat. Room air temp. in °C:	Temperature of the room air
Cool./Heat. Load in W:	The required power for the room
Suspended ceiling height:	Distance from floor to suspended ceiling
Occupation height:	Height of the occupancy zone

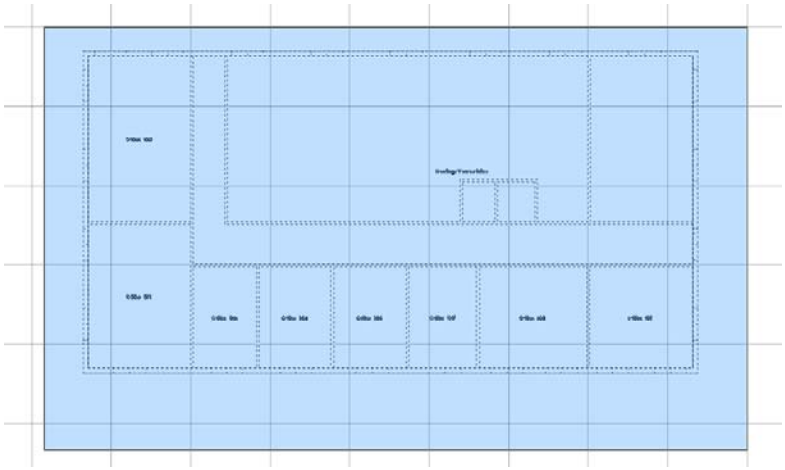
You can edit the zone afterwards by dragging on the AutoCAD Grip points in the corners or on the lines.

lindQST Upload

After creating rooms / zones with the Add Space command you can upload the spaces into lindQST.

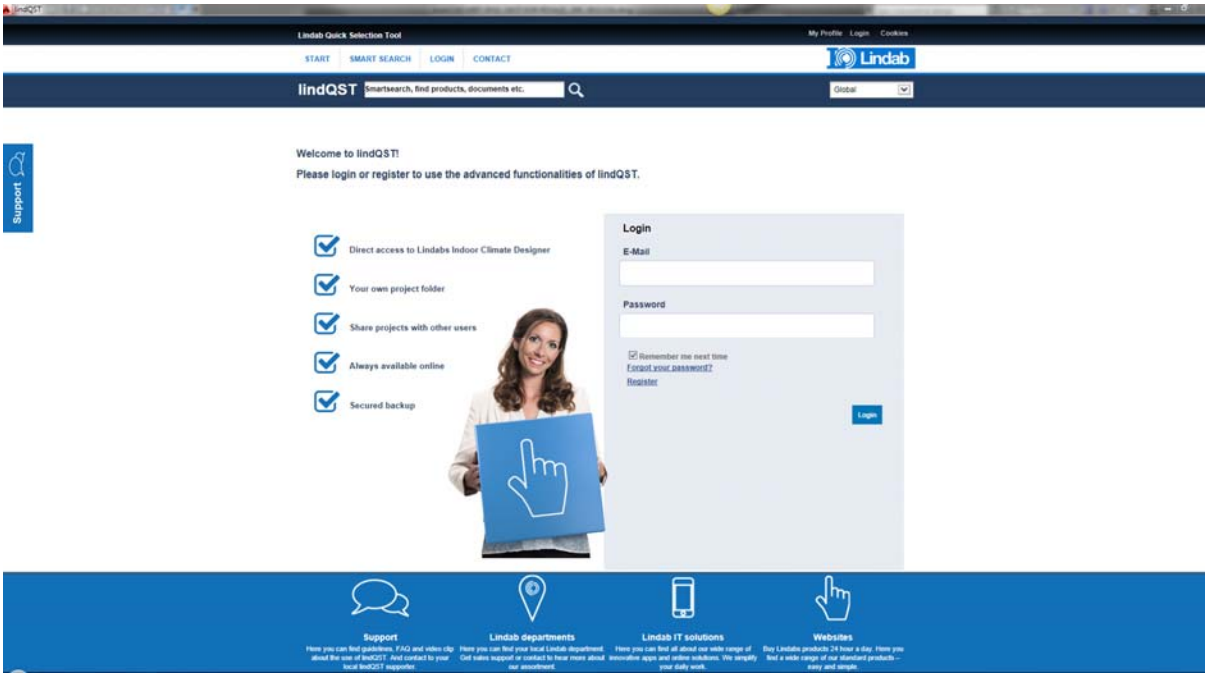
Note: The upload is not limited to a single room. You can upload multiple rooms in one process.

1. Activate the lindQST Upload command
2. Mark all spaces you like to update to your project in lindQST.
   Note: You can all time add more spaces to your project in lindQST



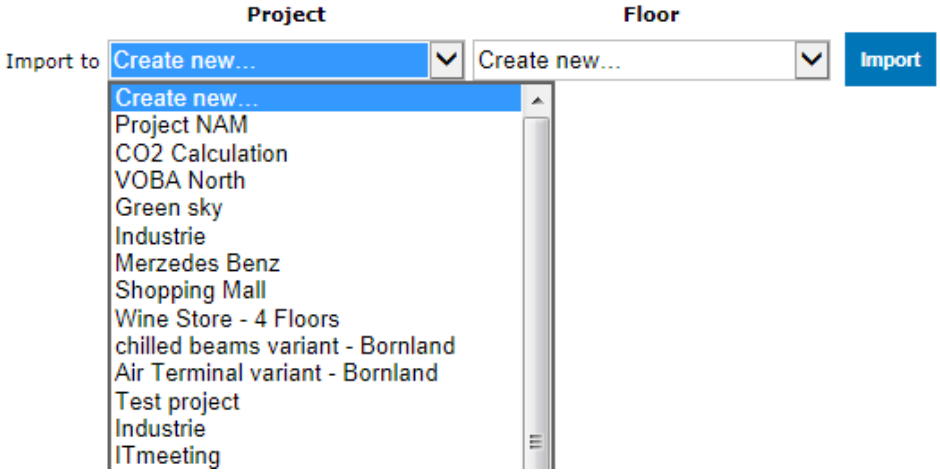
Mark multiple CADvent spaces for the upload to lindQST

3. Accept your selection with Enter
4. A browser window opens and ask you to log in.
5. Please enter your login data or register for the project area in LindQST



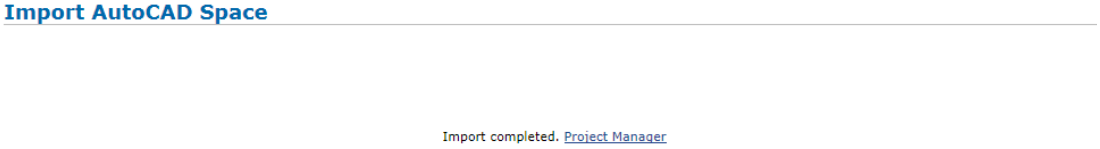
lindQST welcome page for non registered or logged out users

6. The following window allows you to add the spaces to an existing or a new project. Please select your choice from the drop down menu
   If you chose an existing project, you can select from existing floors or add a new.



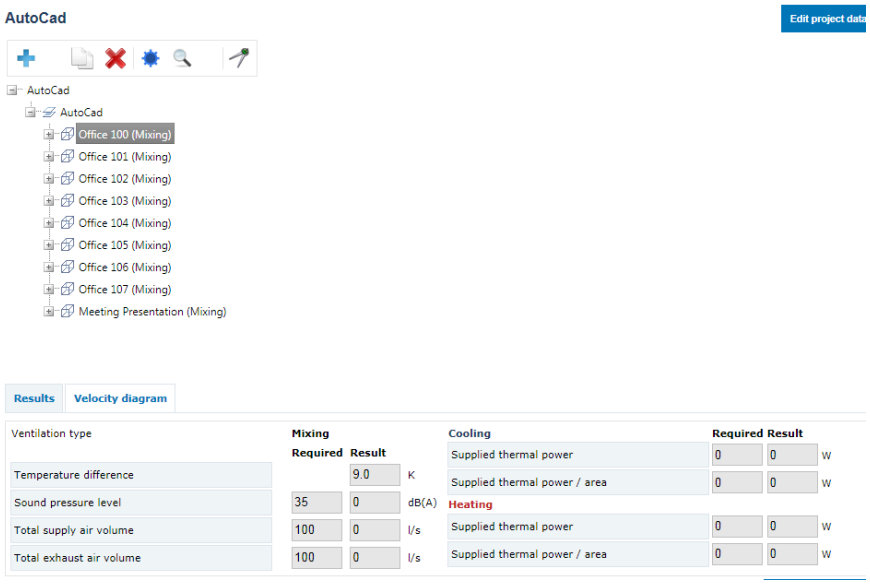
lindQST project selection

7. If you select ‚Create new…' for project and floor. Lindqst will automatically name the project and floor „AutoCAD", which you can rename in a later state.



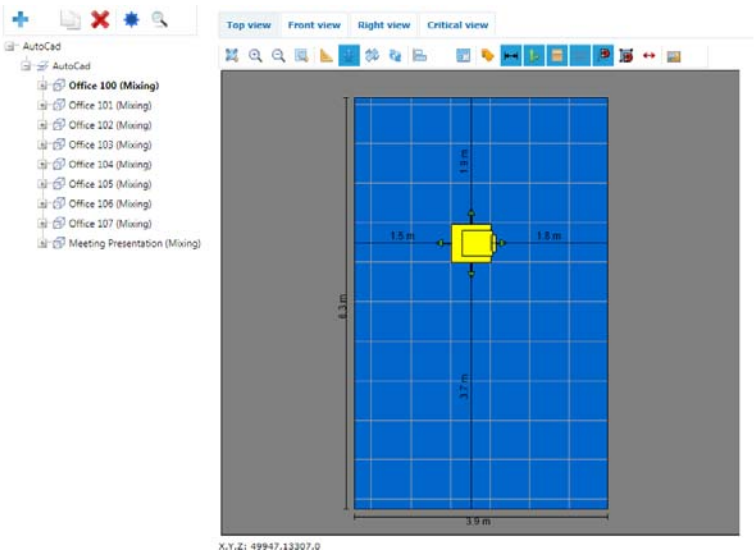
lindQST verification of the project upload and link to Project Manager

8. The import complete message confirms the correct upload process. Using the Project Manager link jumps you directly to your project in lindQST.



lindQST project tree

9. Here you can define a suitable diffuser or chilled beam based on the fiven room size and technical requirements.



Leakage and Leakage Area Calculation

Σ EN 14239 Leakage Area

Ventilation systems have to be defined and build with low leakage values.

Air leakage can have following negative effects:

The AHU has to deliver X% more air then calculated. That effects

- a worse SFP value
- higher air velocity
- higher pressure lost
- higher energy costs for air conditioning

  (heating, cooling, (de-)humidifying, filtering)
- higher soundvalues (+ sound values from leakage points like whistle sound)
- necessary to build bigger system sizes
- higher system producing costs

- higher Life Cycle Costs
- more inefficient real estate

with all resulting problems.

Leakage classes

The leakage classes according to the EN 13779 are defined in 4 classes: A to D, whereby D is the best class. The measurement procedures are defined in EN 12237, EN 1507, EN 1751 and EN 15727

A - (Class A not mentioned anymore in newest norms)

B - is the general minimum requirement

C - in a lot of situations the required minimum class

D - Lindab Safe = Lindab required leakage class

Definition of the leakage classes

The leakage classes are defined in leakage air flow per m² surface area at a specific static system pressure.

Leakage class	Max. leakage per m² (f_{max}) l /(s·m²)
A	0,027 x $p_t^{0,65}$
B	0,009 x $p_t^{0,65}$
C	0,003 x $p_t^{0,65}$
D	0,001 x $p_t^{0,65}$

P_t = test pressure

The leakage area has to be calculated according to EN 14239.

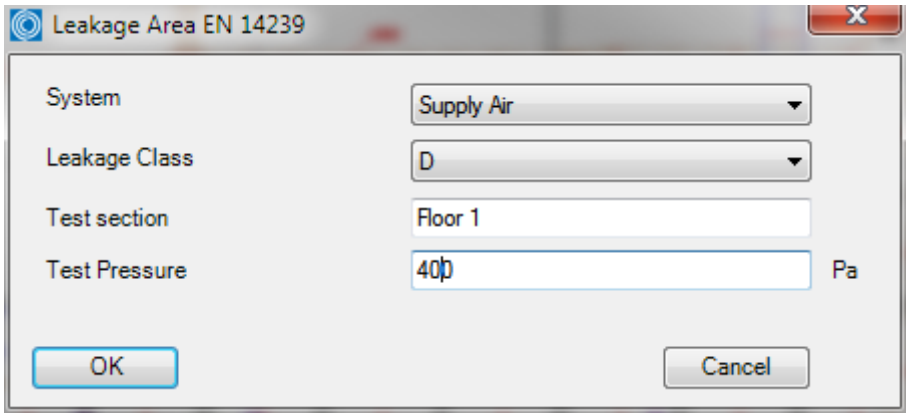
You can find more details about the leakage test process here:

http://itsolution.lindab.com/lindabwebproductsdoc/pdf/documentation/ads/lindab/mounting/manual-ltest-1082_en-de-fr-se.pdf

(If the link below does not work, please go to www.Lindab.com and search for "Manual-Ltest")

Leakage Area Calculation:

1. Activate the command *leakage area.*

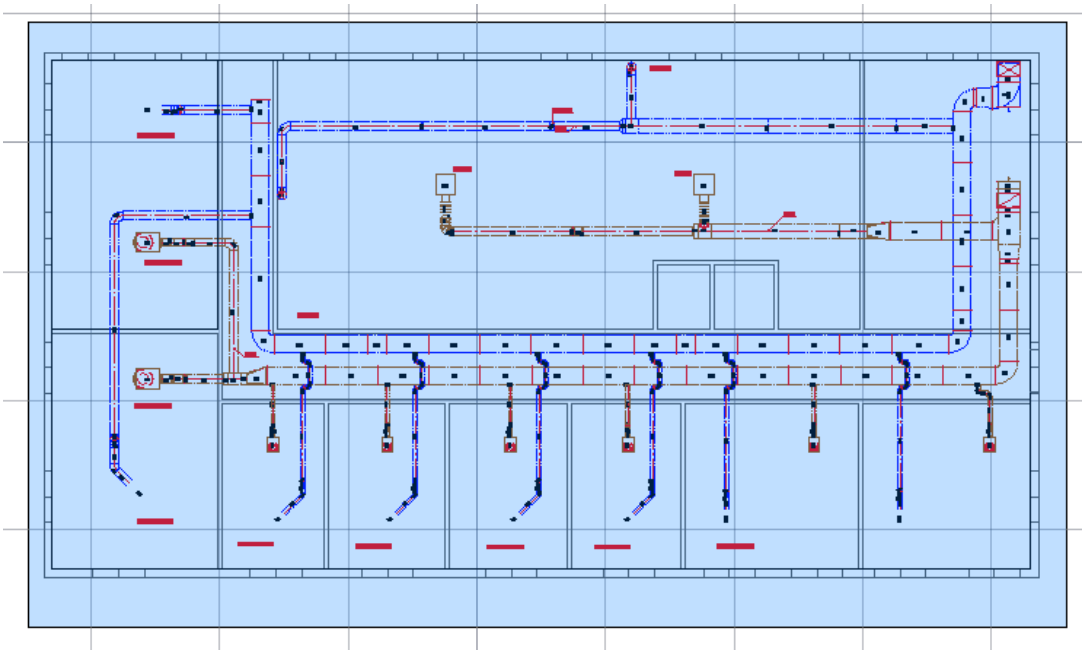


2. Select System in the drop down menu.
3. Select the required Leakage Class in the drop down menu.

Note: The test area needs to be at least 10m² (EN 12237)

4. Define the name for the *Test section* and the value for *Test Pressure*
5. Mark the system that shall be calculated and accept with ENTER

Note: Air Terminals are not part of the calculation and will be listed with a suface area 0m². We recommend to freeze the air terminal layer before selecting the system. This will order the system to create a virtual plug, which will be part of the calculation. (see Leakage Plug)



6. A calculation report according to EN 14239 will be generated:
   All pages of the report contain a head with all necessary test informations and the calculated Area according to EN 14239, named as ”Leakage Area in section” as well as the max. Leakage in the test section totally in l/s and l/s m².

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Leakage Area EN 14239

CADvent Plugin 1.6.0 for MagiCAD

System	Supply Air
Test section	Floor 1
Expected Leakage class	D
Test pressure	400 Pa
Max Leakage per m²	0,049 l/(sm²)

Leakage Area in section	**71,166 m²**
Max Leakage in section	**3,50 l/s**

Produkt	Pos. nr.	Calculation (mm)	Area (m²)
LBXR-500-300-500-90-100-LS-LS-25-25	321	1600*750	1,200
LBXR-300-500-300-90-100-LS-LS-25-25	320	1600*550	0,880

The content of the product lines is:

Produkt	Pos. nr.	Calculation (mm)	Area (m²)
BU-100-90	356	314*200	0,063

Product name — Piece Label — Circumference * Length — Area

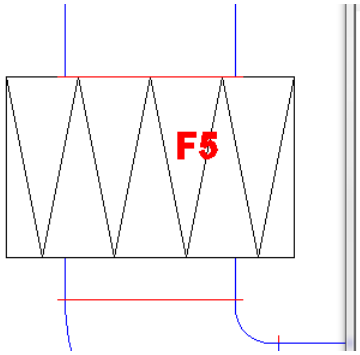
Leakage plug

Open ends will be closed by a virtual leakage plug. The plug is named with TEST Leakage Plug, which is calculated and included in the list.

TEST Leakage Plug 500x300	150000	0,150

Special Components

Self defined components or components with a different surface then calculated by the CADvent Plug can get a forced Area.

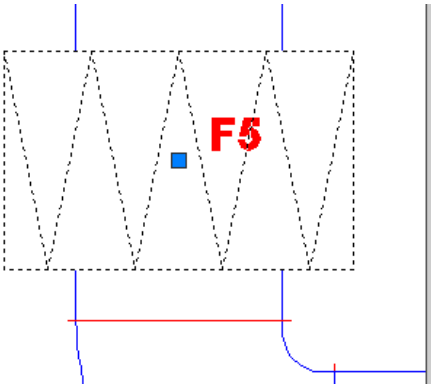


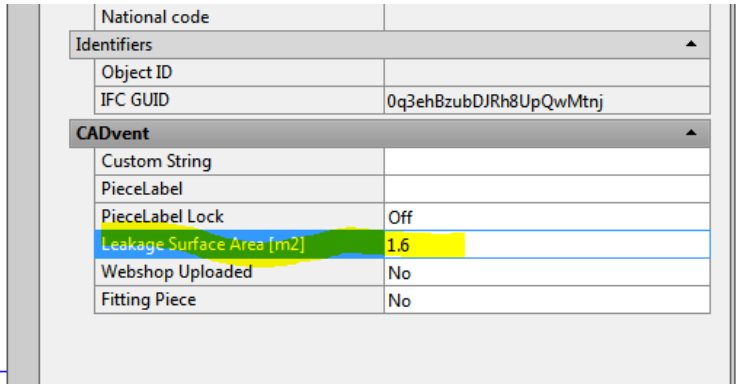
Max Leakage in section 0,27 l/s

Produkt	Pos. nr.	Calculation (mm)	Area (m²)
F5			0,000
LKR-500-300-125-*		1600*125	0,199
LBXR-500-300-500-90-100-*-25-25		1600*750	1,200
LKR-500-300-640-*		1600*640	1,024
LKR-500-300-1264-*		1600*1264	2,022
TEST Leakage Plug 500x300		150000	0,150
TEST Leakage Plug 500x300		150000	0,150

This can be changed by the CADvent property area in the AutoCAD properties dashboard.

1. Mark the product
2. Open the properties dashboard
3. Add the Leakage surface Area in m²





4. The manual changed area is shown in red in the report.

Produkt	Pos. nr.	Calculation (mm)	Area (m²)
F5			1,600
LKR-500-300-125-*		1600*125	0,199
LBXR-500-300-500-90-100-*-25-25		1600*750	1,200