Operation manual

Door and Window Module

CAD Kitchens 8.0, CAD Decor 4.0, CAD Decor PRO 4.0

INTRODUCTION

This manual is intended to familiarize users with working with the new Doors and Windows Module. It describes the look and new functionality of the module, as well as the built-in doors and windows databases. The document will take you step-by-step through the process of adjusting the model and inserting doors and windows into the project. It also shows the ability to edit the model inserted into the project.

Additional tips will make it easier to work with specific types of doors and windows that require attention to specific parameters or perform complementary actions during insertion.

We wish you a pleasant and fruitful work with our software!

CAD Projekt K&A Team

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1. Getting Started with the Doors and Windows Module

The Doors and Windows module allows you to insert windows and doors into a project created in CAD Decor PRO, CAD Decor or CAD Kitchens. To turn it on, click on the second icon from the left on the Interior1 taskbar (Fig. 1).

Fig. 1 - The Interior 1 bar with the icon of the Doors and Windows module highlighted.

It is best to start working with the module after drawing the walls of the room. However, it is possible to insert elements outside the wall, which you can read more about in the section on doors and separately for windows.
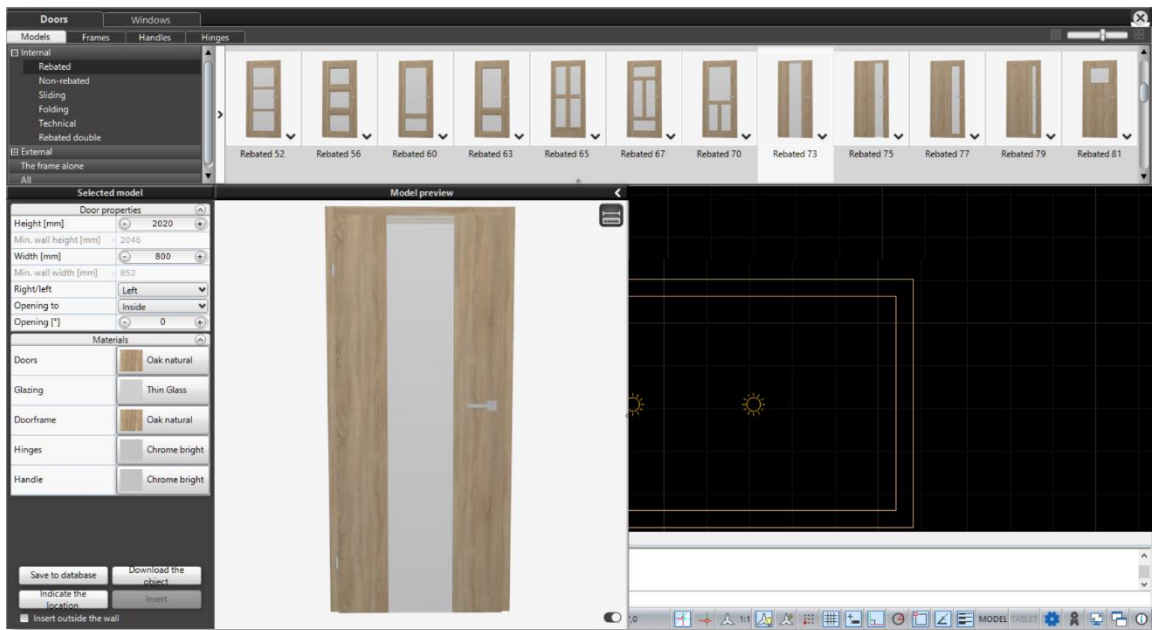
2. Description of the module's window elements

Fig. 2 - Window of the Doors and Windows module

The module window (Fig. 2) is divided into two main tabs: *Doors* and *Windows*. In both tabs, the top panel shows previews of models (and groups of models) divided into categories. There are tabs responsible for individual parts of the window or door, which allows you to adjust the selected model to your preferences. The lower part of the window contains information about the selected model and its 3D preview. In the module exists default, extensive databases of windows and doors models, which can be further modified.

At the bottom of the window on the left is the *Selected model* panel and to the right is the *Model preview* window. The left panel contains options devoted to the properties of the model and adds the ability to specify materials for individual elements of the model. In the lower part of the panel there are 4 function buttons.

- 'Save to database' – saves the selected model with the set parameters to the user base,
- 'Download the object' – allows you to download from the project a previously inserted model with its parameters, after downloading it can be further modified,
- 'Indicate the location' – takes you to the environment and allows you to indicate where to insert the model,
- 'Insert' – inserts the model at the previously indicated location (becomes active after previously using the Indicate the location button).

Under the buttons there is a box to check 'Insert outside the wall', after selecting which it becomes possible to insert a door or window model outside the wall, anywhere in the project.

The *Model preview* window displays a real-time visualization of the selected model. The model can be zoomed in or out and rotated at will. In the bottom right corner there is a button to change the background color of the preview. It allows you to view the model against a light or dark background. At the top right of the preview window are icons that give access to additional functions.

The first of these is the 'Element dimensions' icon, after activating which measures appear on the preview and the exact dimensions of the object are displayed. It is available for both windows and doors. The icons 'Custom scaling' and 'Show/hide windowsill' will be described in the further part of the manual, dedicated to the insertion of windows.

When you select the 'Element dimensions' icon, the dimensions of the door including the frame - the larger dimension - and the wall opening - the smaller dimension - are displayed. The dimensions given in the tab on the left refer to the size of the door, i.e. the light (free space) of the frame. For windows, the dimensions of the entire window and its individual wings are displayed.

3. Inserting doors into a project

After starting the Doors and Windows module, the program will display the module window with the *Doors* tab open by default. In the module there is a wide base of models in various configurations, which will allow you to match the door to any interior. To insert a door into the project, you need to select the appropriate model and adjust its elements.

3.1 *Doors* tab

In the upper window panel of the Doors and Windows module, door models from the universal database provided by CAD Projekt K&A have been placed in the *Doors* tab.. Door models and components are divided into separate tabs: *Models, Frames, Handles* and *Hinges.*

In the *Selected model* panel (Fig. 3) on the left side of the screen, there are two sections: *Door properties* and *Materials*. In the first, you can edit the features of the selected model, such as height and width. You can set whether the door should be right or left and how it should be opened: inward or outward to the room. There is also an 'Opening [*]' parameter, which is responsible for how the door is represented in the visualization. All door models can be inserted into the project in closed or open form. The way of opening depends on the type of door.

Depending on the door model selected, an additional parameter *Ventilation* also appears in the *Door properties.* It allows you to select from a drop-down list one of the 6 types of ventilation available for usage. This feature appears only for doors tagged 'Undercut'. More about tags in the next subsection .
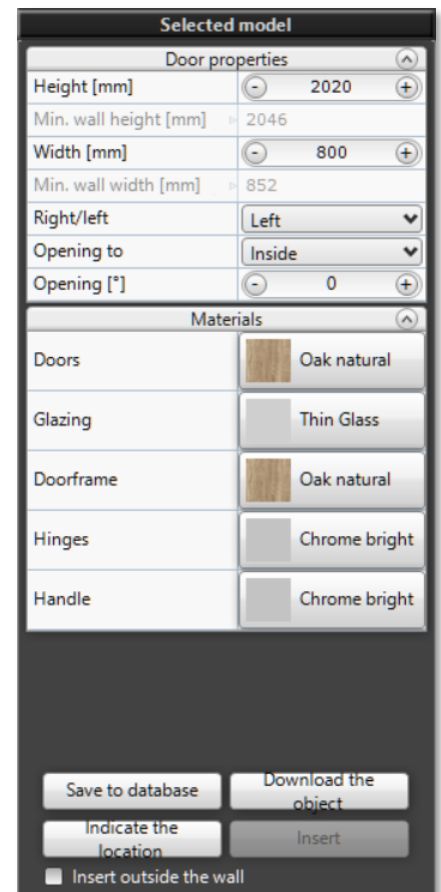
> **NOTE**
>
> The parameter 'Opening [*]' determines the degree of opening of the door. For swinging doors, it indicates the angle of opening, and for folding and sliding doors, it indicates the percentage of opening.

Fig. 3 - Panel *Selected model* in the *Doors* tab

In the *Materials* section, you can choose the type of materials you want the door to be made of. Several types of wood and metal are available, as well as several types of glazing for doors that are glass or have glass elements. Materials can be changed separately for the door leaf, door frame, handle, hinges and additional components, such as the lock.

3.2 Doors database

Along with the Doors and Windows module, an extensive database of universal door models has been provided. Each of the models can be modified, adjusting the individual elements according to your requirements. By changing the type of frame, handle, hinges, adding a lock or ventilation, you can create your own door model and then save it to the user base. It gives you the opportunity to speed up your work by saving frequently used configurations.

The door models in the database are divided into the following categories: *Internal, External, User* and *The frame alone* without the door leaf (Fig. 5). You can also select the *All* category, which will display all available models. The *User* category is displayed only after the first door is saved to the database.
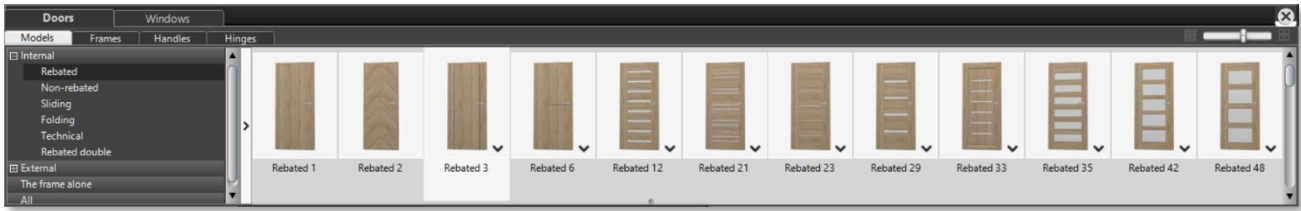

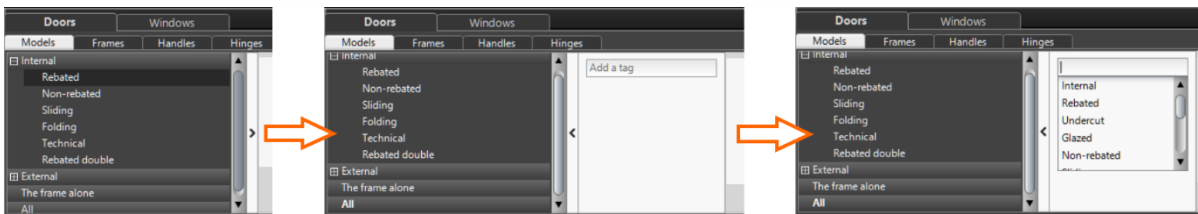Fig. 5 - Top panel of the module window with a tree of door model categories

Fig. 4 - Filtering with tags

Among the interior door models we can find subcategories of doors: *Rebated, Non-rebated, Sliding, Folding, Technical* and *Rebated double*. Among the models of external doors we can find *Single* and *Double* doors. In the *User* category, the doors will be divided into such subcategories as we create when saving the doors to the database. When you select *The frame alone* category, the program switches from the *Models* tab to the *Frames* tab.

Models can be filtered using **tags** (Fig. 4). This function is located on the right side of the category tree, under the arrow button. After pressing it, the search panel will expand. You need to click on the 'Add a tag' box, after which the list of defined tags selection will expand. For example, to view all glass and glazed doors, select the *Glazed* tag.

Some door models in categories and subcategories are combined into groups of different variants (Fig. 6). They differ, among other things, in the presence of glazing, the location of decorative metal elements or the number of inserted panels. Groups of models are marked in the lower right corner with a downward-pointing arrow. To expand the list of variants in a group, click on the group image in the top panel of the module window. The arrow in the lower right corner will change direction from pointing down to pointing up, and a list of door model variants will expand under the group image.
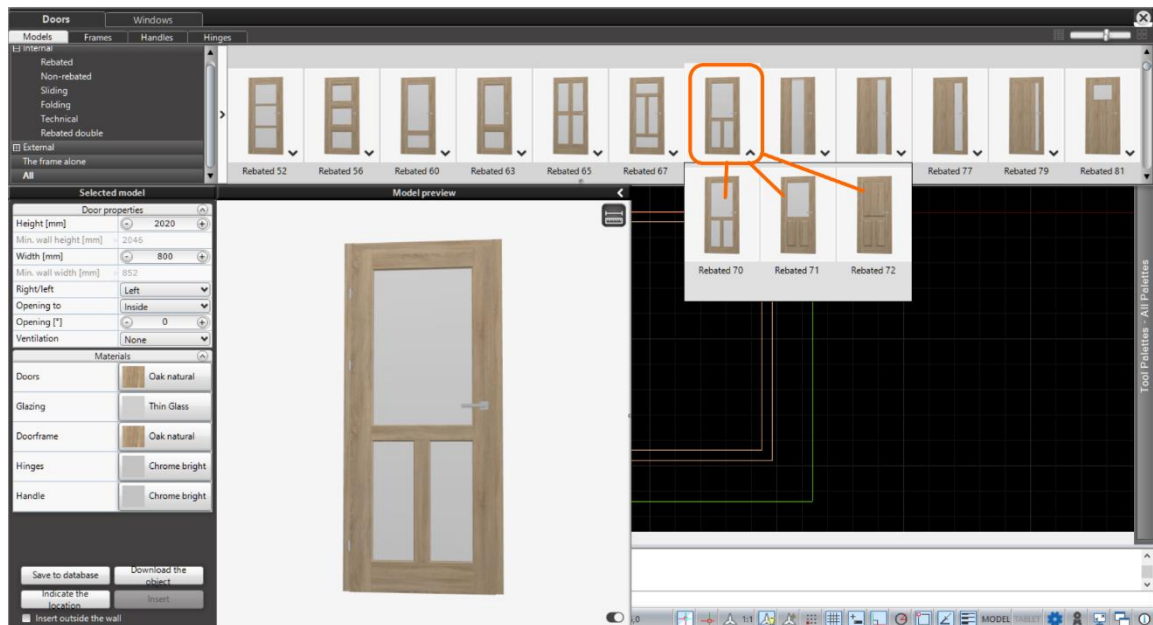

Fig. 6 - A group of doors in the model selection panel

3.3 Inserting selected doors

3.3.1 Editing the model

To insert a door into the project, from the environment, go to the Doors and Windows module by left-clicking (LMB) on the second from the left icon in the Interior 1 taskbar. The module window opens, by default set on the *Doors* tab (Fig. 7). Choose a category from the tree on the left, and then a door model from the list on the right. The door is selected by clicking with the LMB.
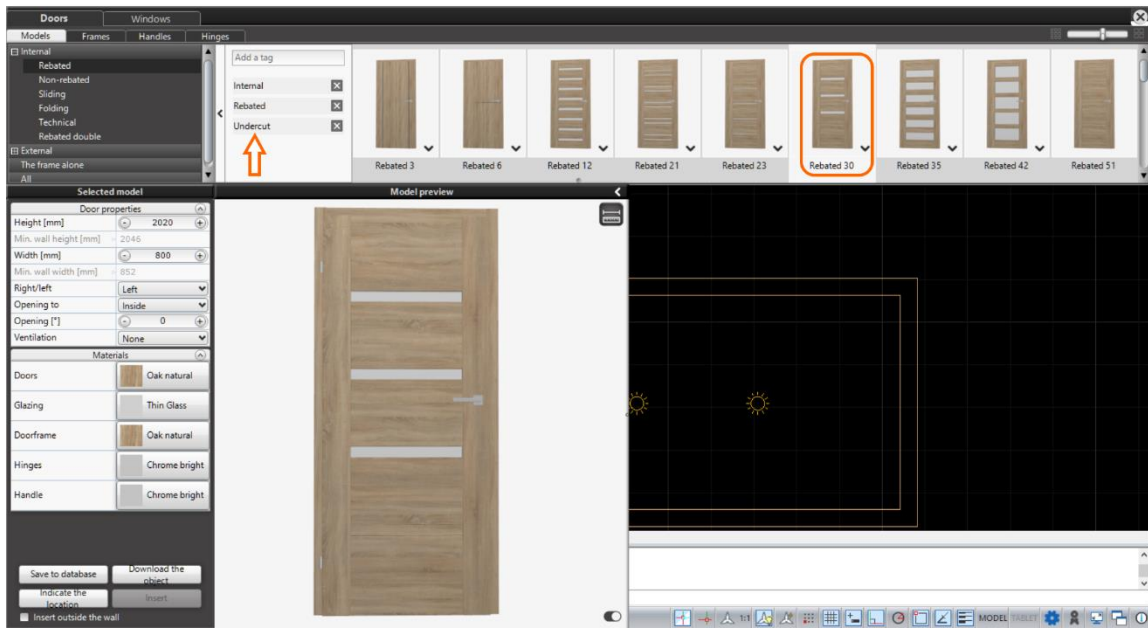

Fig. 7 - Choosing a door with the tag 'Undercut'

Once you have selected the basic door model, you can proceed to modify it. To change the default frame, go to the *Frames* tab. The program will display a list of frames in the database that match the selected door model (Fig. 8). The frame is selected by clicking on the desired model with LMB.
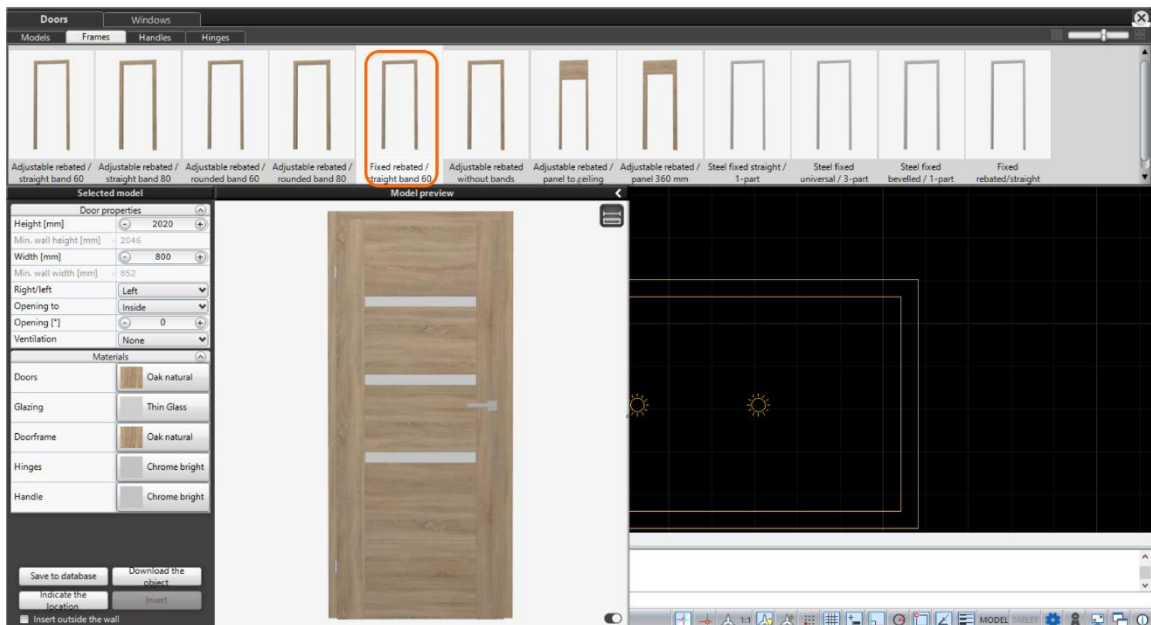

Fig. 8 - Choosing a frame

The next step in editing the door model is to choose the handles. To select matching handles, go to the next tab, i.e. the *Handles* tab. A wide selection of door handles, knobs and handles has been prepared in the door database, so filtering by tags has been applied to them as well (Fig. 9). To select a tag from the prepared list, click on the arrow to the right of the category tree. A panel with a tag selection box will then expand. When you click on it, you will see a list of tags to choose from. Handle and knob models come in groups with different lock variations to choose from.
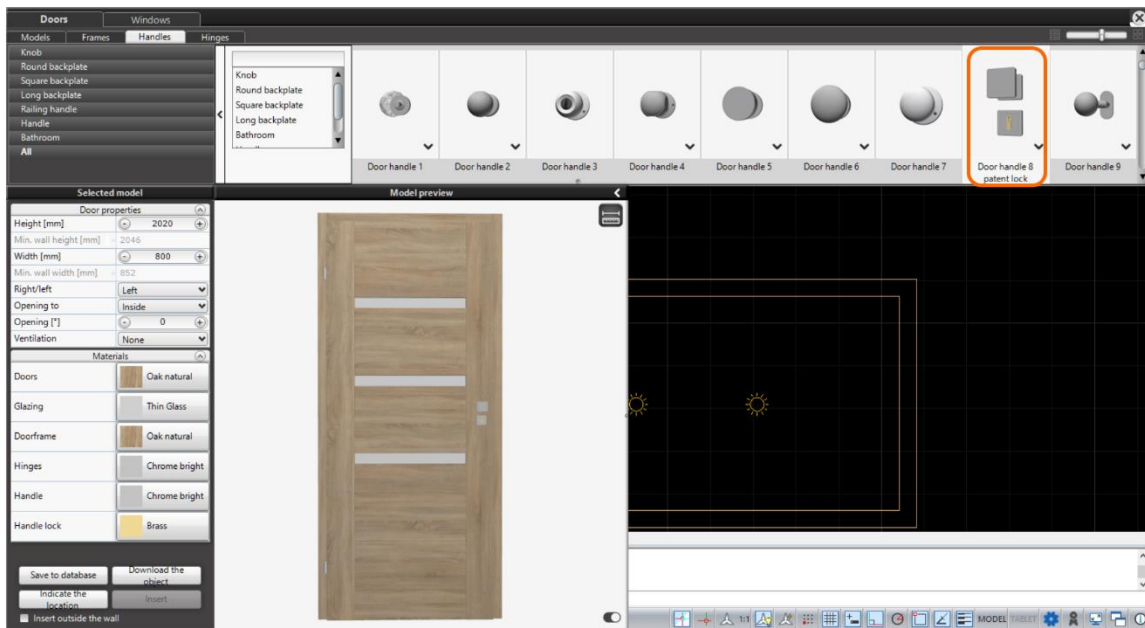

Fig. 9 - Choosing a handle

The last of the elements of the model that can be changed are the hinges. To edit them, go to the last tab in the top panel - *Hinges*. A list of hinges matching the selected door model will be displayed (Fig. 10). Click LMB on the selected hinges.
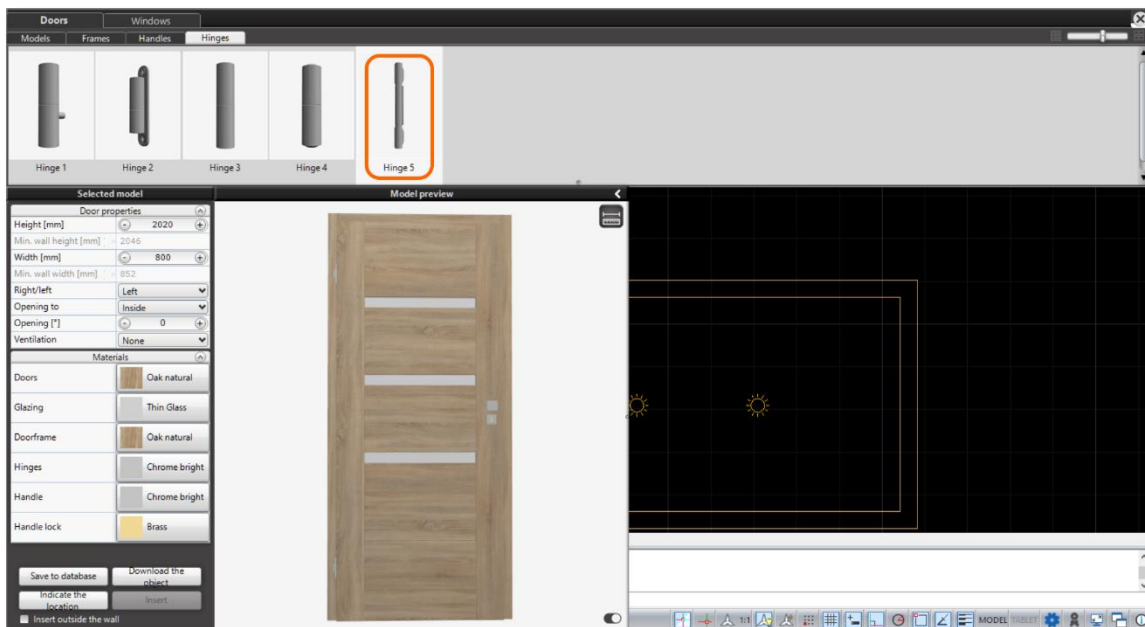

Fig. 10 - Choosing the hinges

3.3.2 Editing door parameters

After editing the elements of the model, you can proceed to set its parameters. They are changed in the *Selected model* panel on the left side of the screen.

In the *Door properties*, select the door opening method (inward or outward) and the position of the hinges (right/left). For models with the 'Undercut' tag, you can choose from several types of ventilation available for the door. The change in ventilation type will be immediately reflected in the model and displayed in the *Model preview* window (Fig. 11). Ventilation can be done in the form of undercuts, holes or grilles.
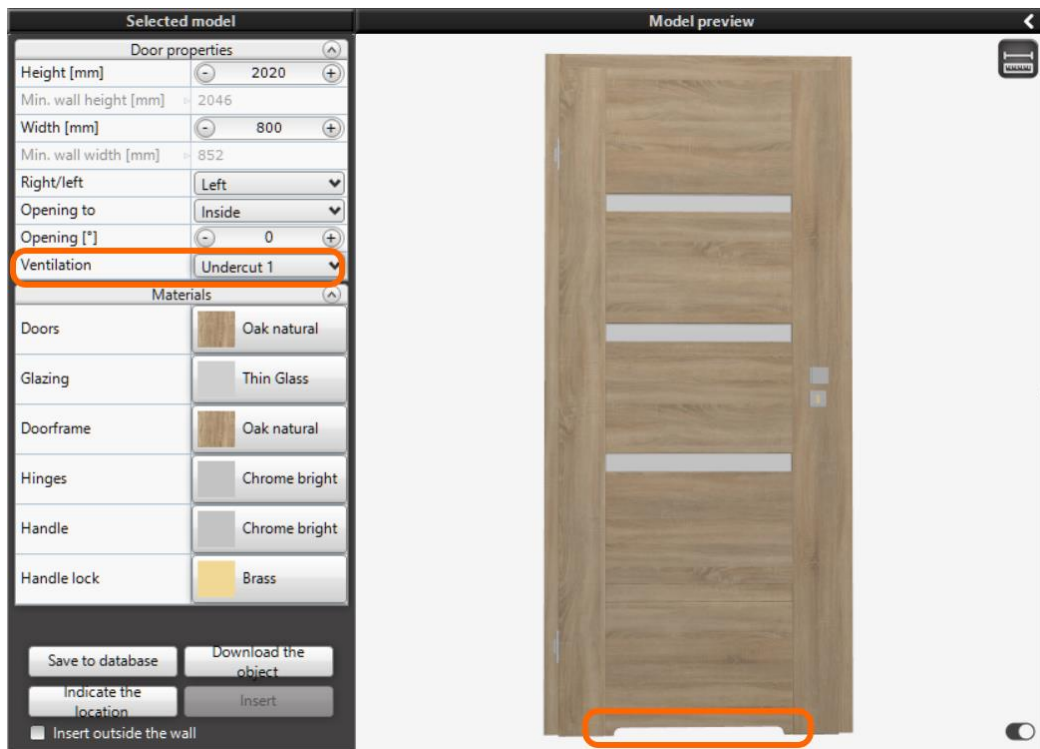
Fig. 11 - Choosing the type of ventilation

The next step is to choose the materials to be used for each door component. They can be changed in the section labeled *Materials*. To change the material, click LMB on the material name for the selected item. A panel will then unfold with available options to choose from (Fig. 12). Confirm material selection by clicking on its name with LMB.

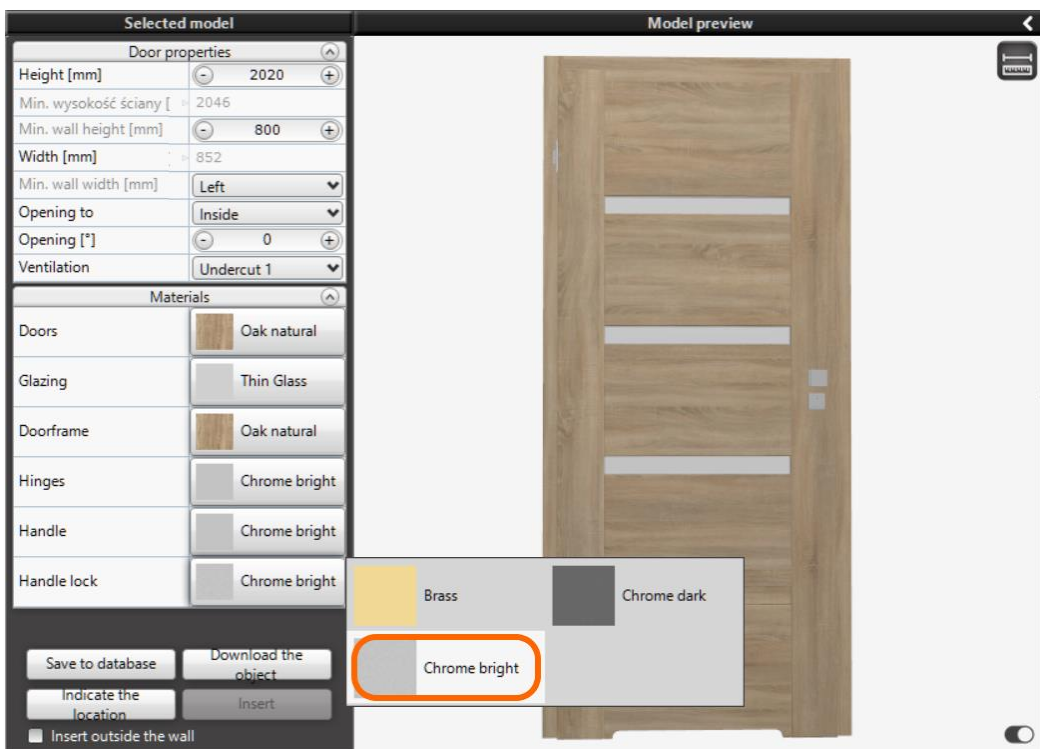Fig. 12 - Choosing the material for hinges

3.3.3 Saving doors to the user database

Once you have created your own door configuration, you can save it to a database to use the model you have created in the future. To do this, use the 'Save to database' button at the bottom left of the *Selected model* panel. After clicking the button with the left mouse button, the *Save object* window will open (Fig. 13).

Before saving the object, you need to give it a name (the default name is 'New Door'). You can also specify the name of the category (for example, 'internal'), to make it easier to browse the models in the user database. After entering the name of the new door, you can save the object using the 'Save' button.

If you decide not to save the model or need to make changes before saving, use the 'Cancel' button and close the *Save object* window.

Saved projects can be found on the category tree in the *Models* tab, under the *User* category. After it is expanded, the categories selected during the saving process will appear, and the panel on the right will show a list of saved models with their previews (Fig. 14).
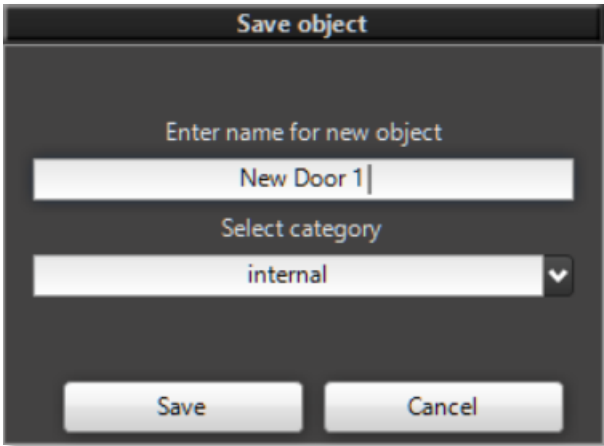

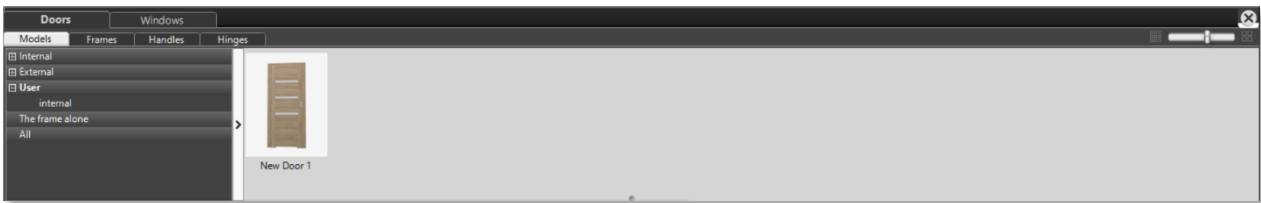Fig. 13 - Saving the model to the user database

Fig. 14 - Models stored in the User database

3.3.4 Inserting a door model into the project

The model selected and adjusted in the earlier steps can now be inserted into the project. The first step is to determine the place where the door should be inserted. To do this, use the ' Indicate the location' button at the bottom left of the screen. After clicking it with LMB, the program will display a view of the environment and a green door symbol, which should be moved to the appropriate place along the selected wall (Fig. 15). To confirm the selection of the indicated place, click on it with LMB.
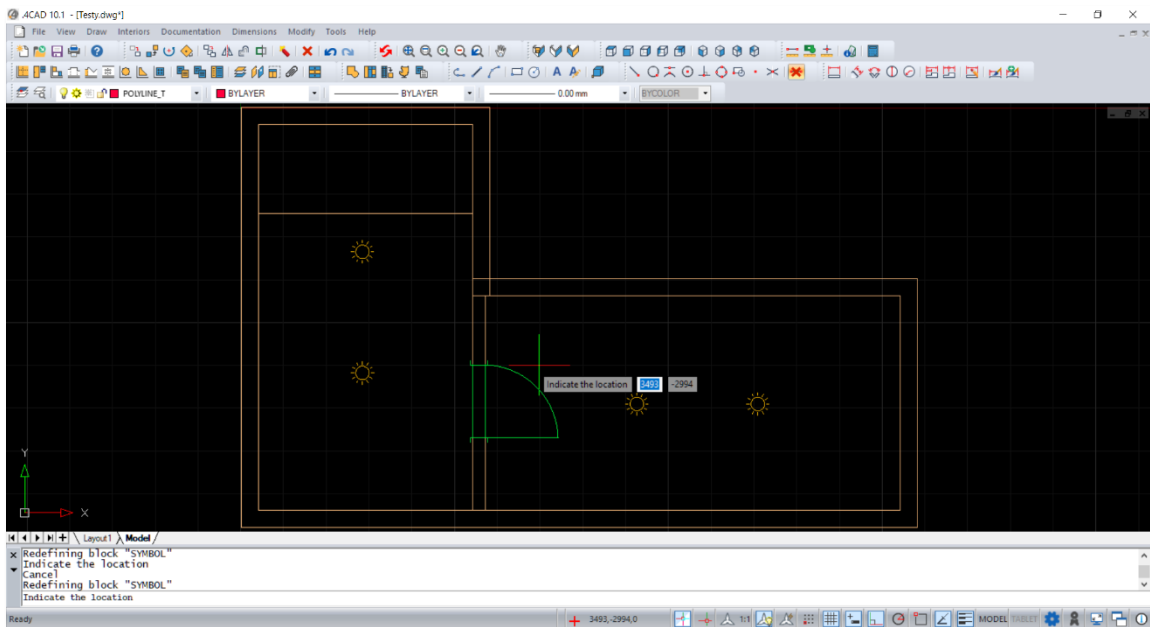
Fig. 15 - Indicating the location of the door insertion

The program will display the Doors and Windows module window again. The user can now more accurately determine the position of the door on the wall. In the *Selected model* panel, there is a new section called *Position on the wall* above the *Door properties* (Fig. 16). You can change the position here by entering the distance from the corner of the wall (distance given in mm). There is also an 'Insertion level' parameter.

After checking the position of the door, you can still use the ' Opening [*]' parameter to open the door before inserting it. This is a new feature available for both door and window models. For swinging doors, it means the degree of opening, and for sliding and folding doors, the percentage of opening. This option for doors can be found under *Door properties*.

At the bottom of the Selected Model panel, the 'Insert' button has become active (Fig. 17), which was previously grayed out and could not be clicked on. Clicking LMB on this button will complete the process of inserting the door, which will be placed in the previously indicated location. Inserting a door automatically quits the Doors and Windows module window. You can now move on to inserting the next door model or proceed to inserting windows, which wil be described later in the manual.
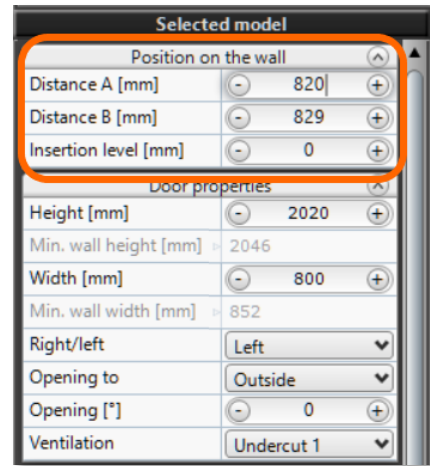
Fig. 16 - Indication of door model position on the wall

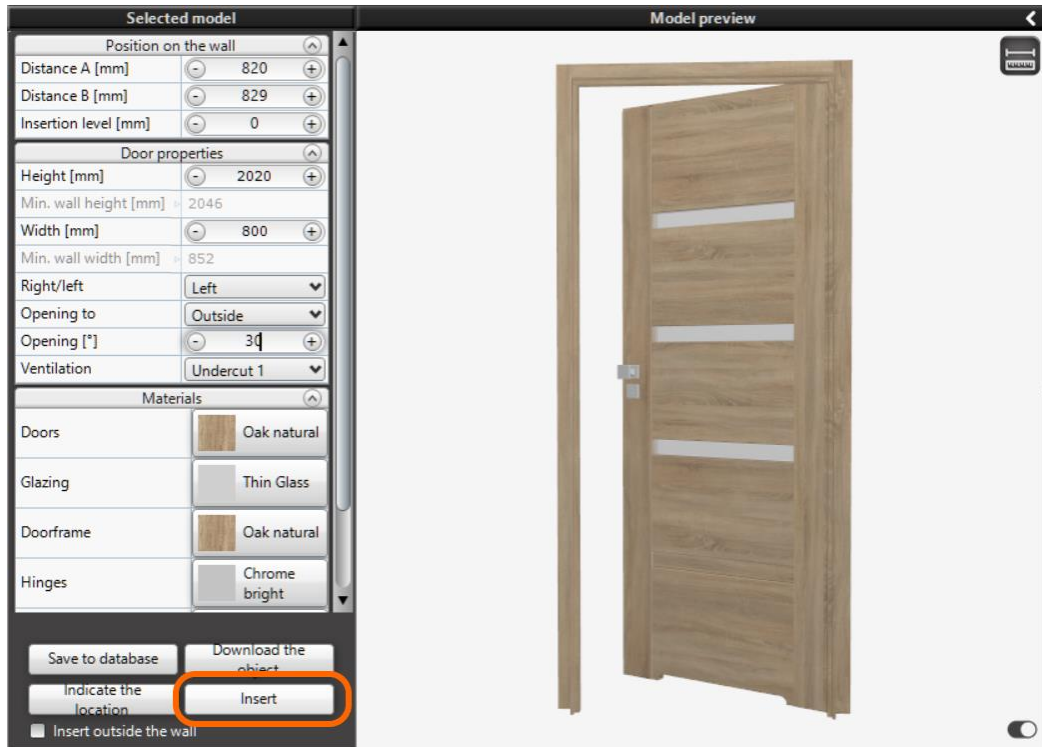Fig. 17 - To insert a door, use the 'Insert' button

3.3.5 Inserting sliding doors

When inserting sliding doors, be sure to check the actual size of the door including the guide rail. This is done using the 'Element dimensions' icon in the upper right corner of the *Model preview* window (Fig. 18). When it is clicked, dimensional lines showing the dimensions of the door will appear in the preview window. Smaller dimension means the size of the opening in the wall. The larger of the marked dimensions is the size of the door including the sliding system, and it is this dimension that should be considered when designing with sliding doors.

When you use the 'Indicate the location' button when indicating the location of the door on the wall, the green door outline displayed in the dot4CAD environment will correspond to the dimensions of the door including the guide rail. This allows the door to be planned at the correct distance from the edges of the wall.
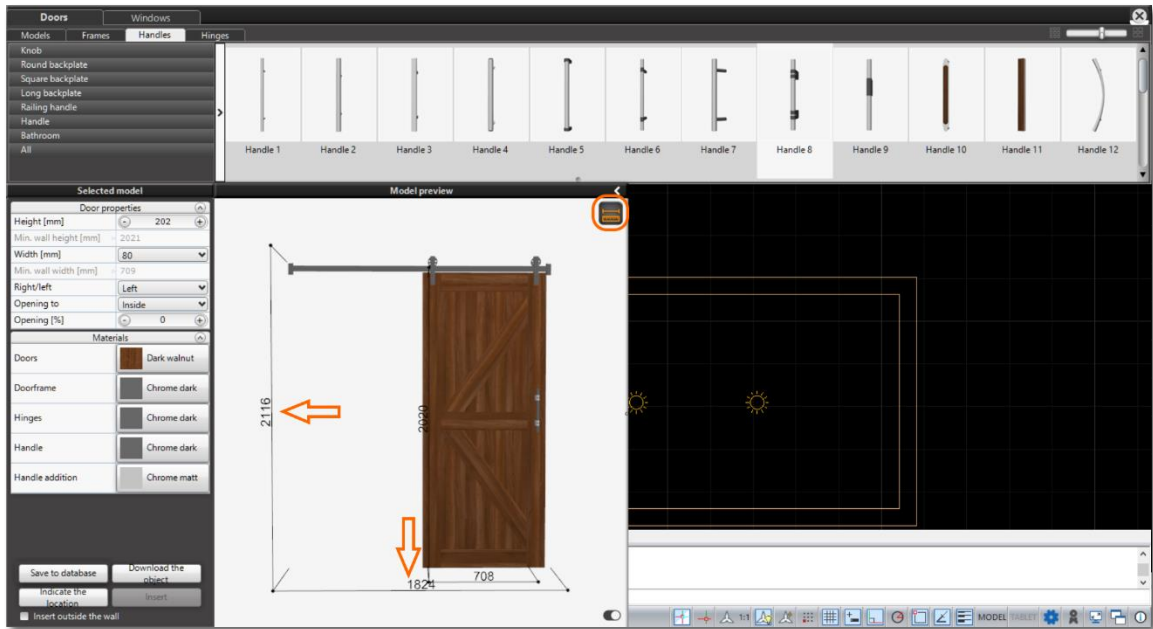
Fig. 18 - Dimensions of sliding doors

3.3.6 Inserting doors outside the wall

In some cases, there may be a need to insert a door outside the wall. To address such situations, a mechanism has been implemented to insert the door freely. When doing so, it is important to remember that the program does not cut holes in the wall when inserting doors outside the wall.

To insert a door outside the wall, select the 'Insert outside the wall' checkbox at the bottom of the *Selected model* panel by clicking on it with LMB (Fig. 19). When the checkbox is selected, the 'Indicate the location' button will become inactive, instead the 'Insert' button can be used.. After clicking LMB on this button, the user will be taken to the dot4CAD environment, and a green door outline will appear in place of the cursor to insert anywhere in the project.
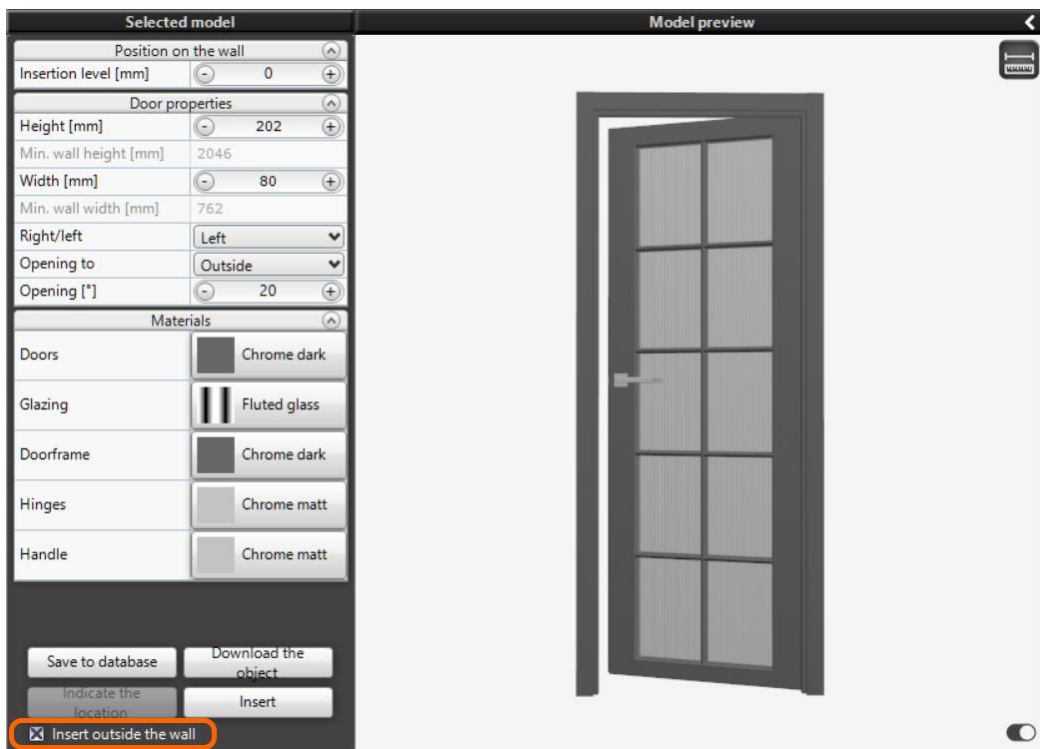

Fig. 19 - Inserting doors outside the wall

3.3.7 Downloading doors from the project

In some projects there may be a need to insert several of the same door models. This can be helped by another of the functions of the Doors and Windows module, which is to download an object that already exists in the project. This is done using the

'Download the object' button located at the bottom of the *Selected model* panel. After pressing the button with LMB, the user is taken to the environment, where he should click on the object to be downloaded. The program copies the settings of the selected object and displays the model in the module window. The user can edit the downloaded model (e.g., open/close the door) or proceed to indicate where to insert it into the project.

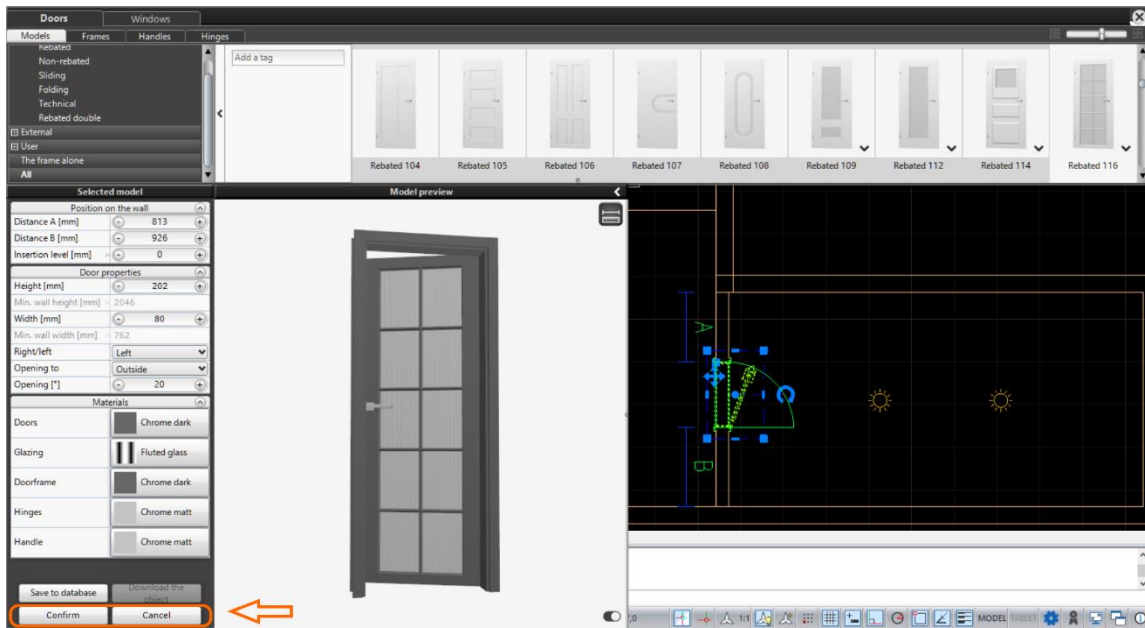### 3.4 Editing the inserted door model

Fig. 20 - Door editing window with changed buttons

The door model inserted into the project can be edited. To do this, you can double-click LMB on the inserted door model or click on it with the right mouse button (RMB) and select *Edit* from the pop-up menu that appears on the screen. After entering the editing mode, the window of the Doors and Windows module will be displayed, with a slightly changed layout (Fig. 20).

In the left panel *Selected model*, the function buttons at the bottom of the panel changes. Instead of the 'Indicate the location' and 'Insert' buttons, there are now 'Confirm' and 'Cancel'. The list of available models in the top panel is also changing. Only models that can replace the edited model are now visible.

After making changes to the model, such as opening or closing the door, swapping to another model, etc., confirm the changes with the ' Confirm' button. If the changes are to be dismissed, use the 'Cancel' button.

4. Inserting windows into a project

After launching the Doors and Windows module, the program will display the module window with the *Doors* tab open by default. To insert windows, switch to the *Windows* tab. The models available in the database are parametric windows, which can be further scaled to achieve a greater variety of models.

4.1 *Windows* tab

In the upper window panel of the Doors and Windows module, windows models from the universal database provided by CAD Projekt K&A have been placed in the *Windows* tab.. Door models and components are divided into separate tabs: *Models*, *Profiles*, *Handles*, *Hinges*, *Windowsills* and *Muntins*.

In the *Selected model* panel (Fig. 21) on the left side of the screen, there are two sections: *Window properties* and *Materials*. In the first, you can edit the features of the selected model, such as height and width. There is a 'Windowsills' checkbox responsible for the presence of sills for the entire window, as well as a 'Vertical
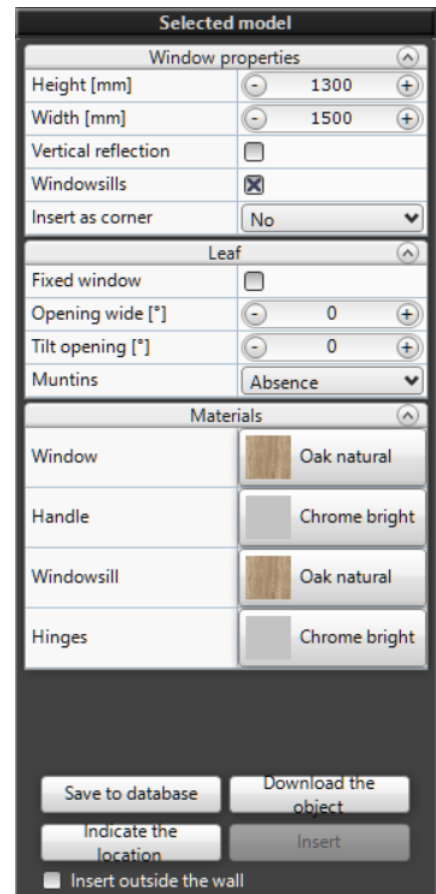

Fig. 21 - *Selected model* panel on the *Windows* tab

Reflection' checkbox. Depending on the model selected, an additional checkbox also appears in the *Window properties* that allows the window to be inserted as a corner window.

When you click on a window sash in the preview window, an additional section below *Window properties* appears, named

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NOTE

The 'Opening [*]' parameter determines the degree and method of opening the window. For windows, a separate setting has been introduced for opening wide and a separate setting for tilting the window. For some windows, only the possibility of tilt opening has been introduced.

Leaf. The settings shown here apply to each window leaf separately. There is a checkbox 'Fixed window' that allows you to mark the leaf as non-openable. It is also possible to open or tilt the given leaf to present these possibilities on the visualization. The last feature located in this part of the panel is the ability to add muntins for the selected leaf.

In the *Materials* section, you can choose the type of materials you want the window to be made of. Several types of wood and metal are available. Materials can be changed separately for the window profile, handles, hinges and windowsills.

Two new icons have been added to the *Model preview* window: 'Show/hide windowsills' and 'Custom scaling' allowing more control over editing the window model.

4.2 Windows database

Along with the Doors and Windows module, an extensive database of universal windows models has been provided. Each of the models can be modified, adjusting the individual elements according to your requirements. By scaling and changing the profile, handles, hinges and adding muntins, you can create your own window model and then save it to the user base. It gives you the opportunity to speed up your work by saving frequently used configurations.

The windows models in the database are divided into the following categories: *Standard, Atypical, Corner, Roof, L- shaped, Terrace, Balcony, Window wall* and *User* (Fig. 22). You can also select the *All* category, which will display all available models. The *User* category is displayed only after the first window is saved to the database. Some of the categories are divided into additional subcategories.

Fig. 22 - Top panel of the module window with a tree of window model categories

Among the standard windows there are subcategories: *1-leaf, 2-leaf* and *Multi-leaf*. The category of atypical windows includes windows *Atypical 1-leaf, Atypical 2-leaf and Atypical multi-leaf*. The corner windows are divided into *Standard* and *Terrace*. On the other hand, windows in the category of terrace windows were divided into *Terrace 1-leaf, Terrace 2-leaf, Terrace multi-leaf* and *Terrace atypical*. Among balcony windows, the following subcategories were separated: *Balcony 2-leaf* and *Balcony multi-leaf*. In the *User* category, windows will be divided into such subcategories as will be created when saving models to the database.

Windows models can be filtered by tags in the same way as for doors. This function is located on the right side of the category tree, under the arrow button. After pressing it, the search panel will expand. Click on the 'Add tag' box, after which a selection list of defined tags will expand.

4.3 Inserting selected window

4.3.1 Editing the model

To insert a window into the design, from the environment, go to the Doors and Windows module by clicking with the left mouse button (LMB) on the second from the left icon in the Interiors 1 taskbar. The module window will open, by default set to the *Doors* tab. First of all, go to the *Windows* tab (Fig. 23).
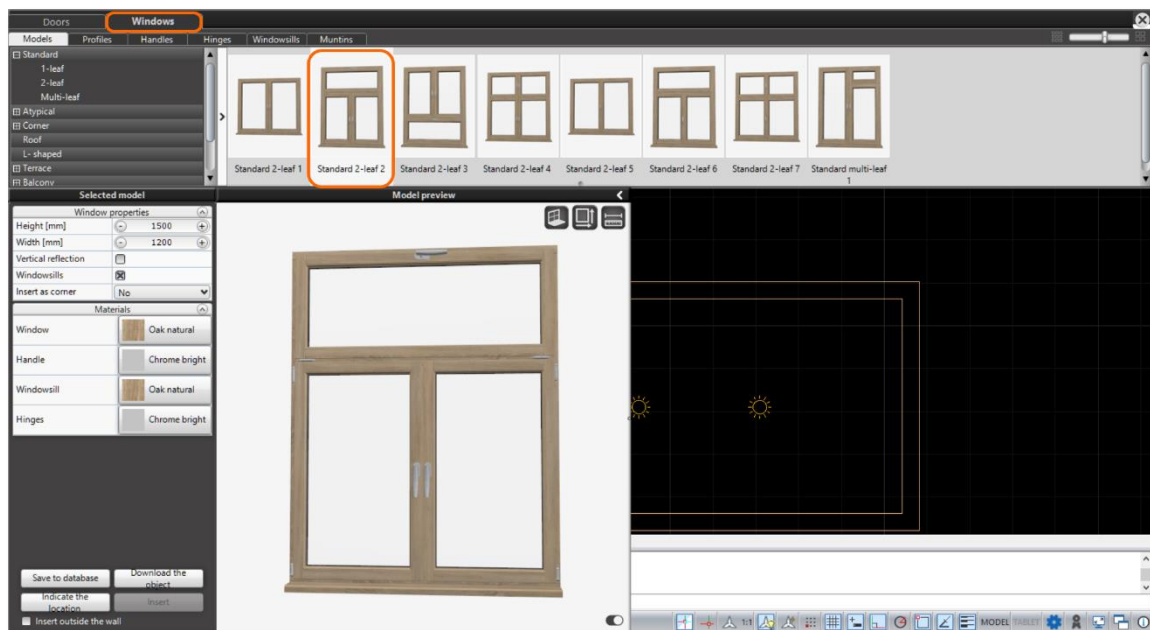

Fig. 23 - Choosing a window from the list of models

To select a window, find the appropriate category and possibly subcategory on the tree on the left side of the top panel, and then the window model from the list on the right. The window is selected by clicking LMB on the selected model.
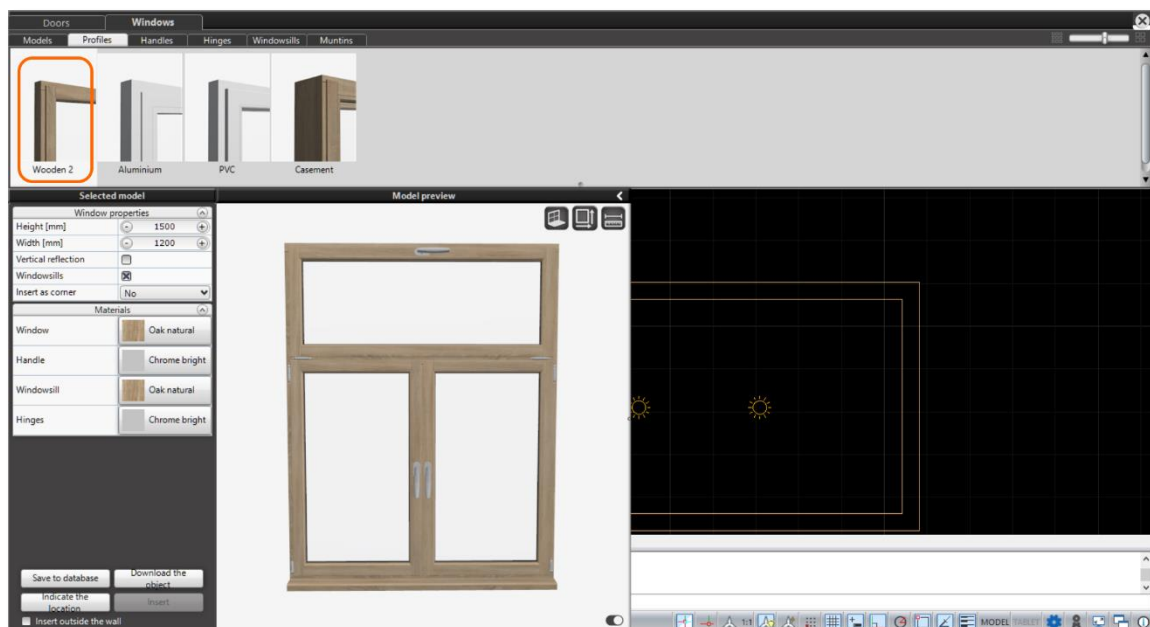

Fig. 24 - Choosing a window profile

Once you have selected the basic window model, you can proceed to modify it. To change the default profile, go to the *Profiles* tab. The program will display a list of window profiles in the database (Fig. 24). These include wood, aluminum, PVC, and box profiles (with double leaves that usually open to the interior of the room). The profile is selected by clicking LMB on the model.

The next step in editing the window model is to select handles. To select matching handles, go to the next tab, named *Handles* (Fig. 25). There are several types of handles to choose from, including handles with a lock. The models also differ in size. The selection from the list of models is confirmed by clicking LMB.
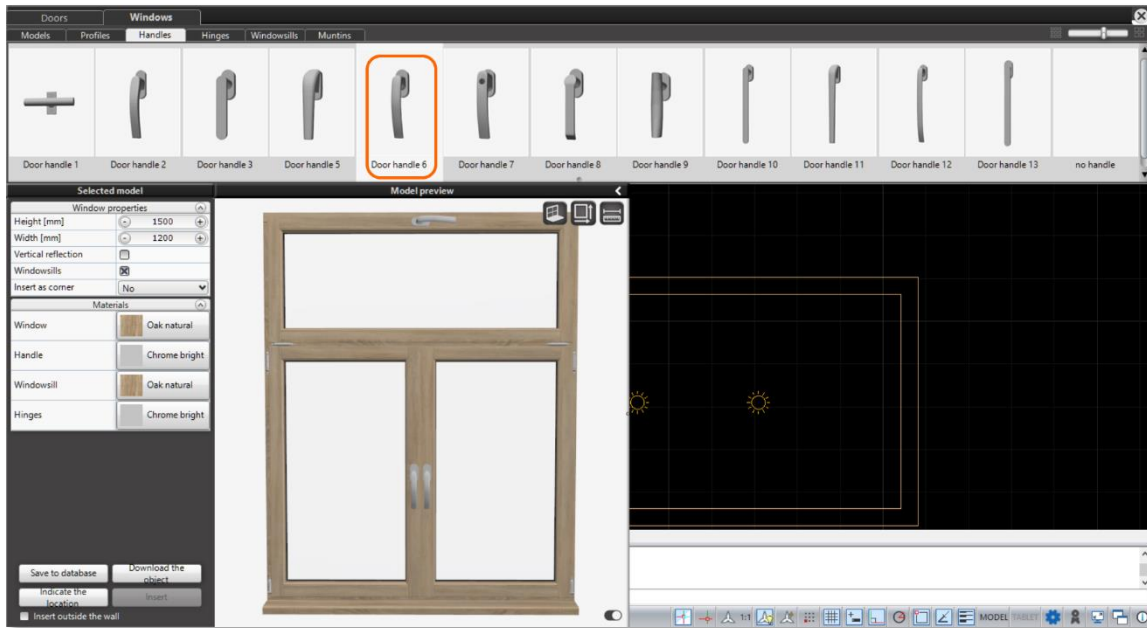

Fig. 25 - Choosing handles for the window

In the next tab, named *Hinges*, the user can select hinges that match the window model being edited (Fig. 26). You can choose from simple or more ornate models. Selection from the list is confirmed by clicking LMB.
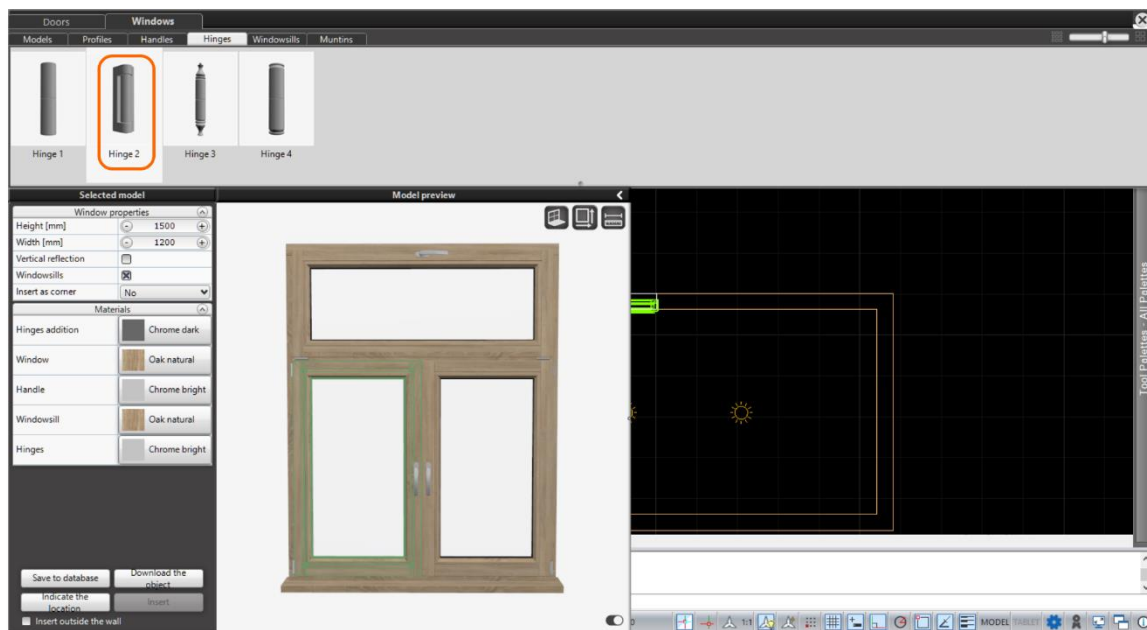

Fig. 26 - Choosing hinges for the window model

The next step in editing the window model is to select windowsills. These can be found in the *Windowsills* tab (Fig. 27). Several types of windowsills are available with straight, beveled or curved ends, as well as PVC windowsills. Each type has been added separately as an element in an alcove or an element on a wall. The windowsill is selected from the list by clicking LMB.

In addition to selecting the type of windowsill, they can also be edited. More information about customizing windowsills can be found later in this manual.
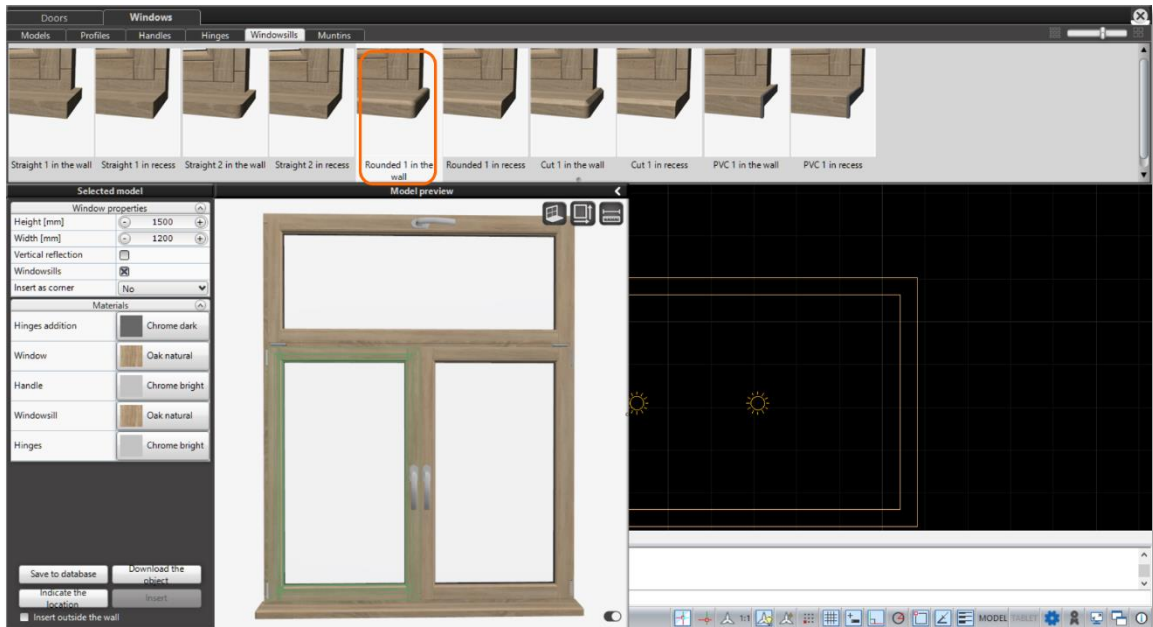
Fig. 27 - Choosing a windowsill from the model list

The last of the tabs is called *Muntins*. There are several models of muntin bars to choose from. However, adding this element is not possible for the entire window, but for individual leaves. Therefore, it will be described in the later section, which is responsible for editing the elements of the window.

4.3.2 Scaling the window

After editing the basic elements of the model, you can proceed to setting its parameters. They are changed in the *Selected model* panel on the left side of the screen. In the case of windows, there is a greater possibility of modifying the model than in the case of doors, related to the use of the *Model preview* window.

In the section called *Window properties*, you can now change the height and width of the entire window by specifying the precise dimensions (in millimeters). Since the windows in the new Doors and Windows module are parametric objects, you can also change the appearance of the model by changing the parameters for individual parts of the window. This is possible thanks to the
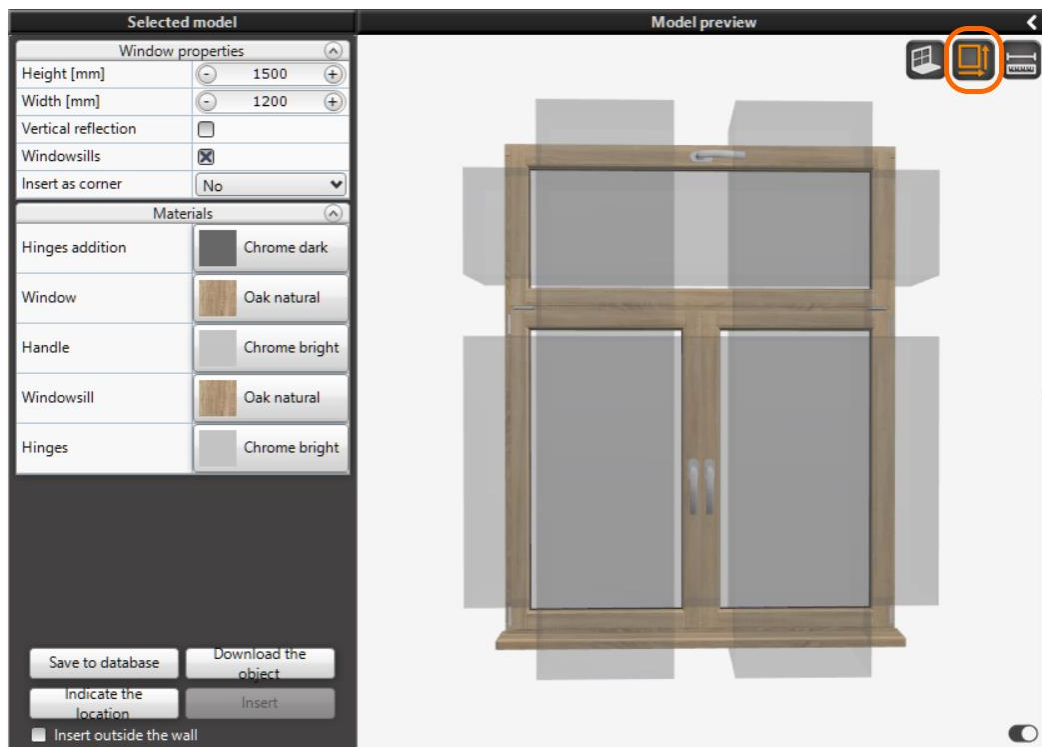

Fig. 28 - Custom scaling icon in the *Model preview* window

custom scaling function. It is enabled in the *Model preview* window thanks to the middle icon in the upper right corner, named 'Custom Scaling' (Fig. 28). Click the icon with the left mouse button.

When the custom scaling function is enabled, gray transparent blocks corresponding to the dimensions of the window leaves, but extending beyond its outline, will appear on the model preview. When you hover the cursor over such a grayed-out area, it turns into an arrow showing the scaling direction. To scale a leaf in a given dimension, click and hold LMB and move the mouse in the desired direction. Custom scaling works for each part of the window separately, for example, for the width of the left leaf (Fig. 29).
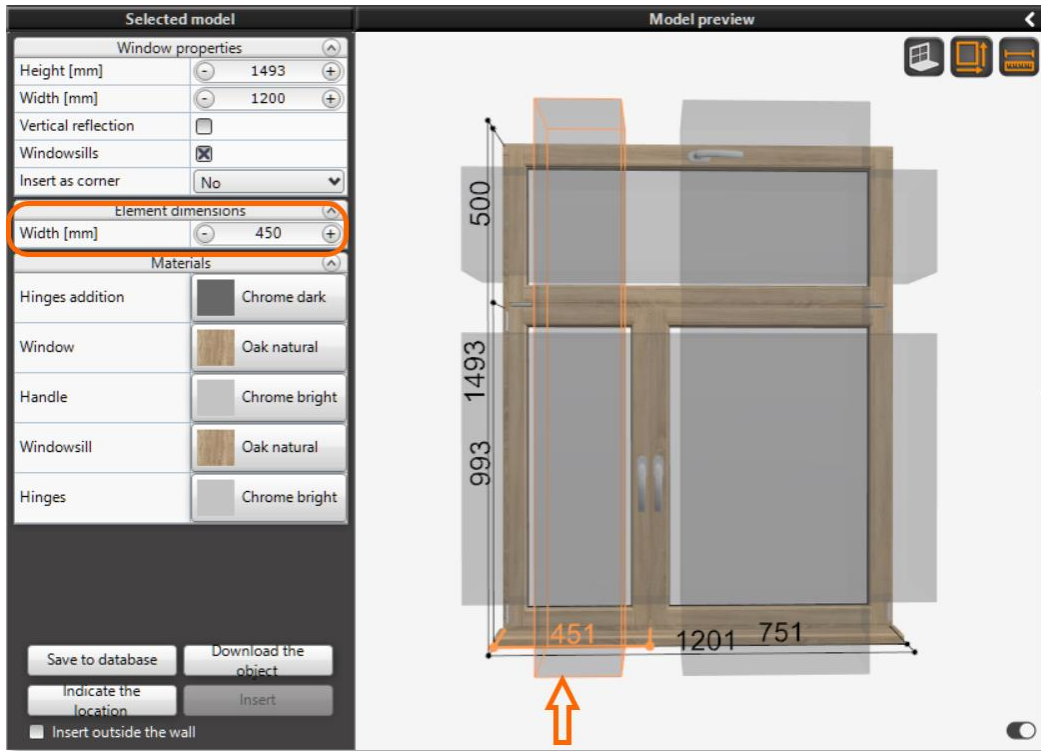

Fig. 29 - Changing the width of the left leaf

You can also precisely specify the dimension of a scaled element by left-clicking on the grayed-out solid. This is done using the *Element dimensions* section, which appears in the *Selected model* panel below *Window properties*. The dimension refers to the entire element (the glass together with the frame). It will be helpful to enable the 'Object Dimensions' function using the icon in the upper right corner of the preview window. This will display the dimensions for all parts of the window. Note that scaling the window arbitrarily will change its overall dimensions.

4.3.3 Editing window parameters

The next step after adjusting the dimensions of the various parts of the window is to modify its other properties. In the Window Properties section, you can check the 'Vertical reflection' option, which will create a mirror reflection of the model (Fig. 30). This is especially useful for asymmetrical or balcony windows, particularly when the desired layout is not among the default models in the database. The reflected model can then be saved to user's database, more on which later in this manual.
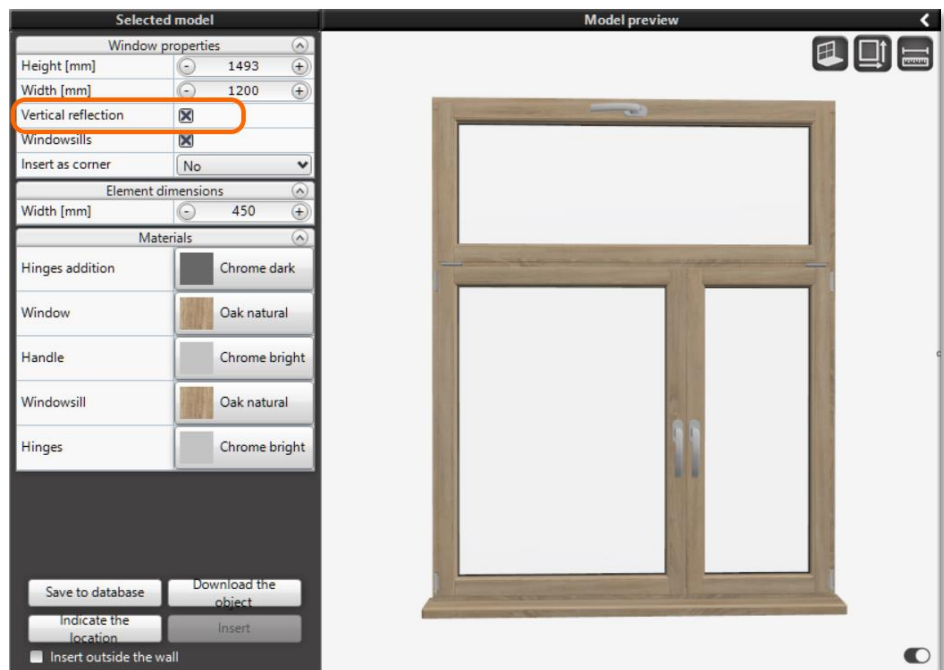

Fig. 30 - Vertical window reflection

The next option is the 'Windowsills' checkbox, selected by default. It is responsible for the presence of windowsills for the entire window model. If it is unchecked all windowsills will be removed from the model. Further editing of the windowsill can be done by LMB clicking on it in the preview. After selecting a windowsill in this way, the *Properties of windowsill* section will appear in the panel on the left (Fig. 31).
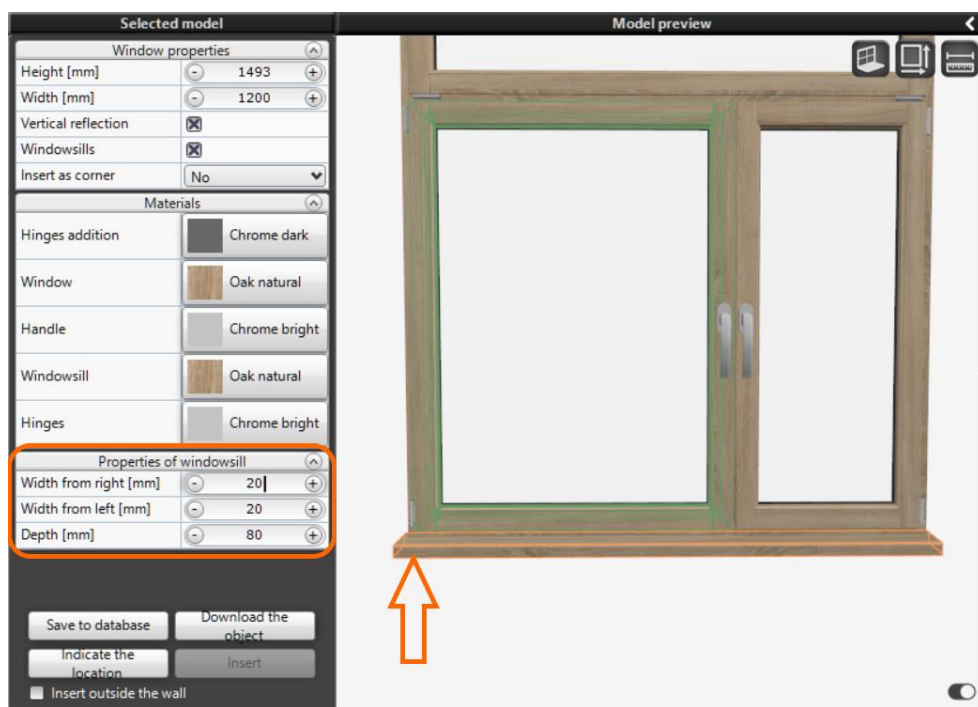

Fig. 31 - Editing windowsill properties

Here you can change the depth of the windowsill, as well as the width on the right and left side of the window. Also related to the editing of windowsills is the first icon from the left in the preview window - **'Show/hide windowsills'**. In the case of multi-leaf windows, it allows you to enable or disable the presence of a windowsill for each leaf individually (Fig. 32). When the 'Show/hide windowsills' icon is active, individual windowsills can be turned on or off by clicking on them in the preview with the left mouse button. In the attached illustration, the windowsill is enabled only for the leaf on the left side of the balcony door.
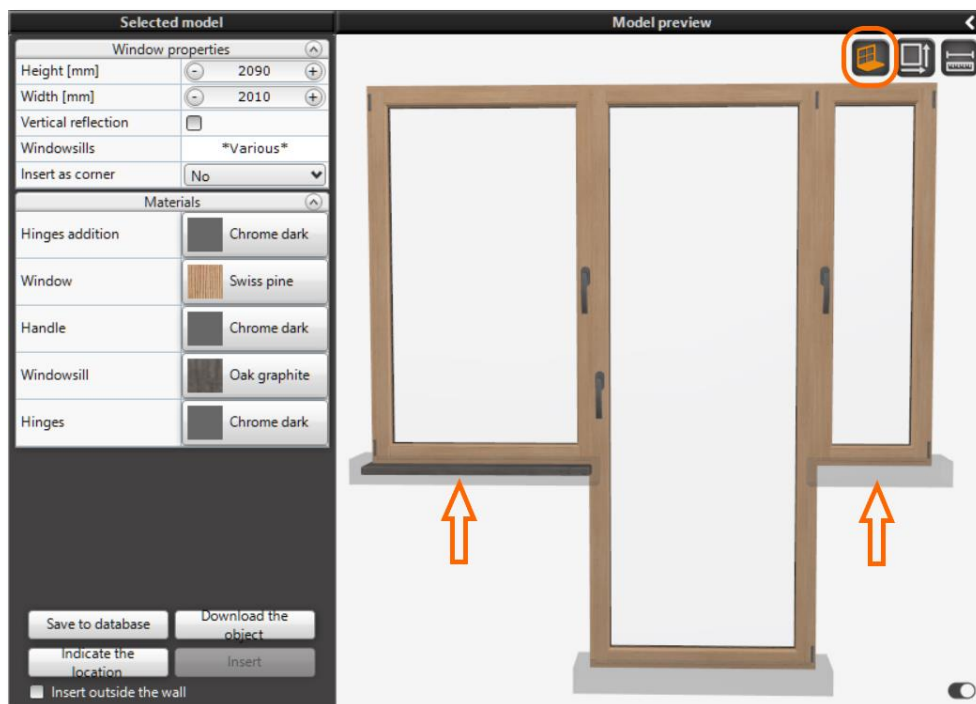

Fig. 32 - The 'Show/hide windowsills' icon allows you to edit the windowsills for each leaf individually

Below the 'Windowsills' checkbox there is also an option 'Insert as corner'. This mechanism is described in section 4.3.9 of this manual.

When you click LMB on any window leaf in the *Model preview*, you can go to edit the parameters for that element. After selecting a leaf, the *Leaf* section will appear in the panel on the left, below the window properties section. Here you can mark the selected leaf as a fixed element, not intended to be opened, thanks to the 'Fixed window' checkbox. After selecting this option on the preview, the appearance of the selected leaf changes - the handle and hinges disappear, as well as the double frame (Fig. 33).
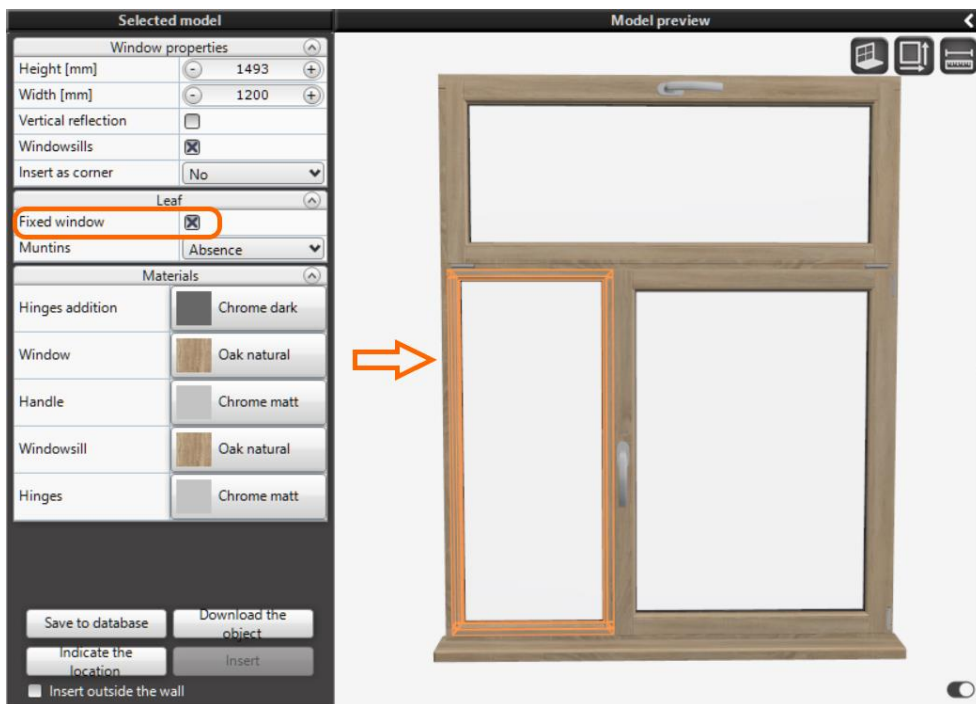

Fig. 33 - Left window leaf marked as fixed

After **selecting a leaf** in the *Leaf* section of the *Selected model* panel, you can also add muntins (Fig. 34). You can choose a traditional, prairie or arched arrangement (for arched windows), and then specify the number of vertical and horizontal muntins (or the number and level of rays for arched windows). The type of muntins is selected in the top panel of *Windows* in the *Muntins* tab, after adding them for the selected leaf.
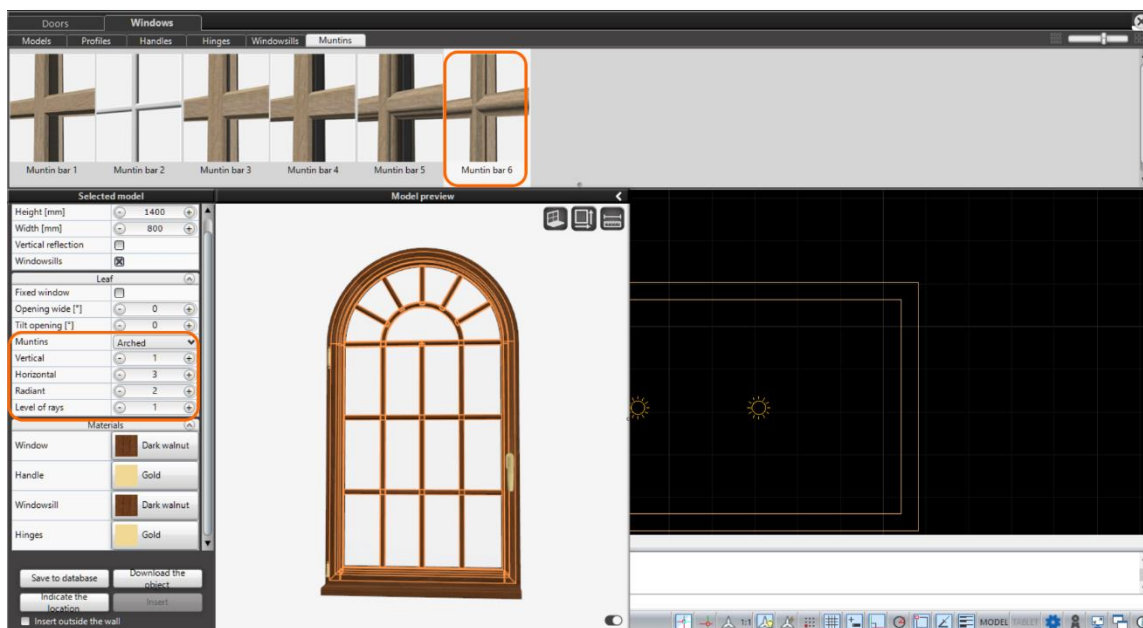

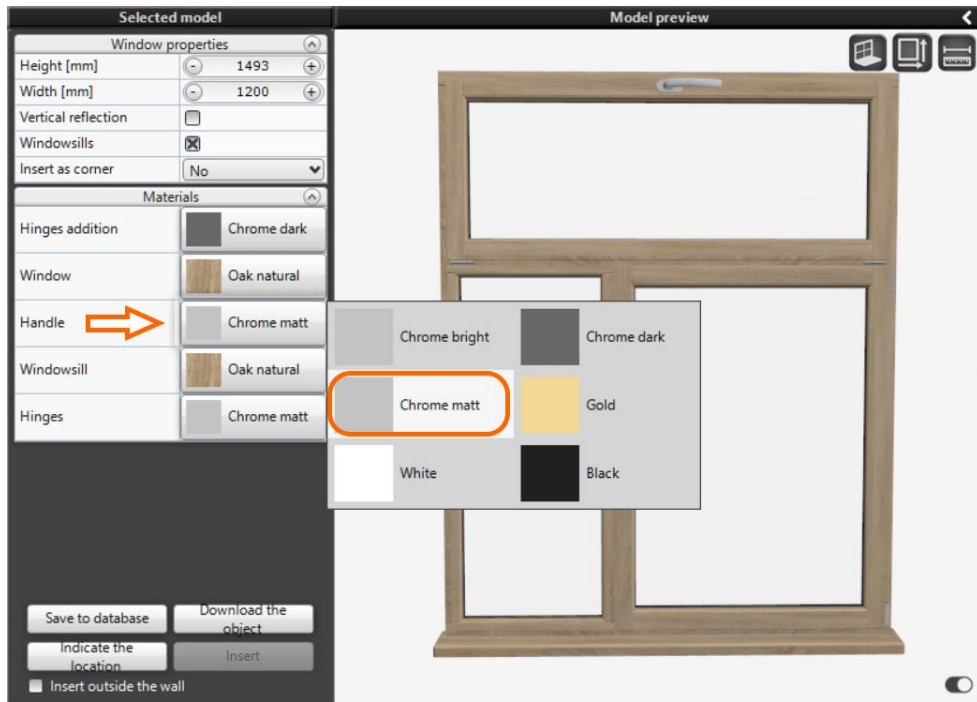Fig. 34 - Options for adding muntins to a window

Fig. 35 - Choosing materials for the window handle

The next step is to select the materials to be used for each window component. These can be changed in the section labeled *Materials*. To change the material, click LMB on the material name for the selected element. A panel will then unfold with available options to choose from (Fig. 35). Confirm material selection by clicking on its name with LMB.

4.3.4 Saving windows to the user database

Once you have created your own window configuration, you can save it to database to use the model created this way in the future. To do this, use the 'Save to database' button, which is located at the bottom left of the *Selected model* panel. After clicking the button with the left mouse button, the *Save object* window will open (Fig. 36).

Before saving an object, you need to give it a name (the default name is 'New Window'). You can also provide a category name (the default is 'New Category') to make it easier to browse the models in the user base. After entering the name of the new door, you can save the object using the 'Save' button.

If you decide not to save the model or need to make changes before saving, click use the 'Cancel' button and close the *Save object* window.

Saved projects can be found on the category tree in the *Models* tab, under the *User* category. After expanding it, the categories selected during saving will be displayed, and the panel on the right will show a list of saved models with their previews (Fig. 37).
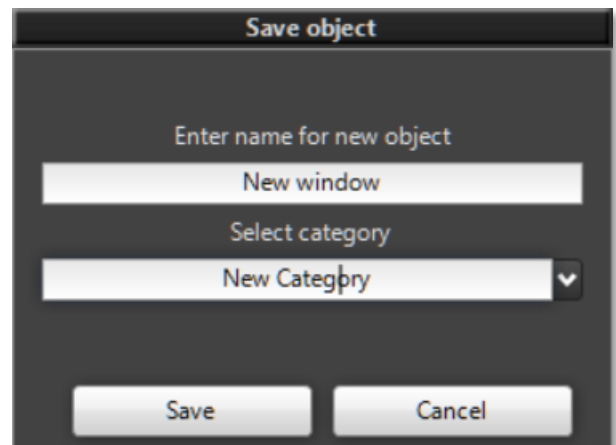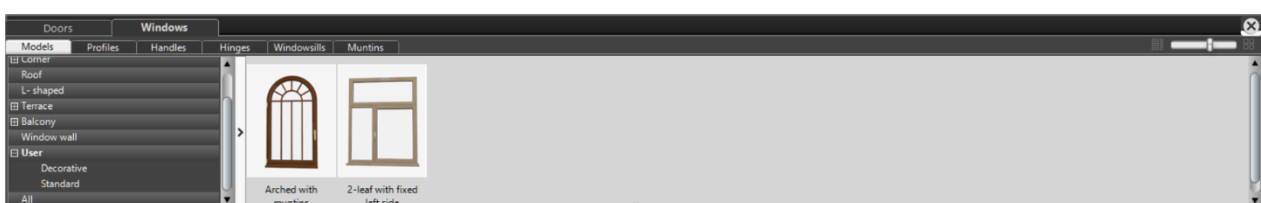

Fig. 36 - Saving the window to the user base

Fig. 37 - Saved windows in the user base

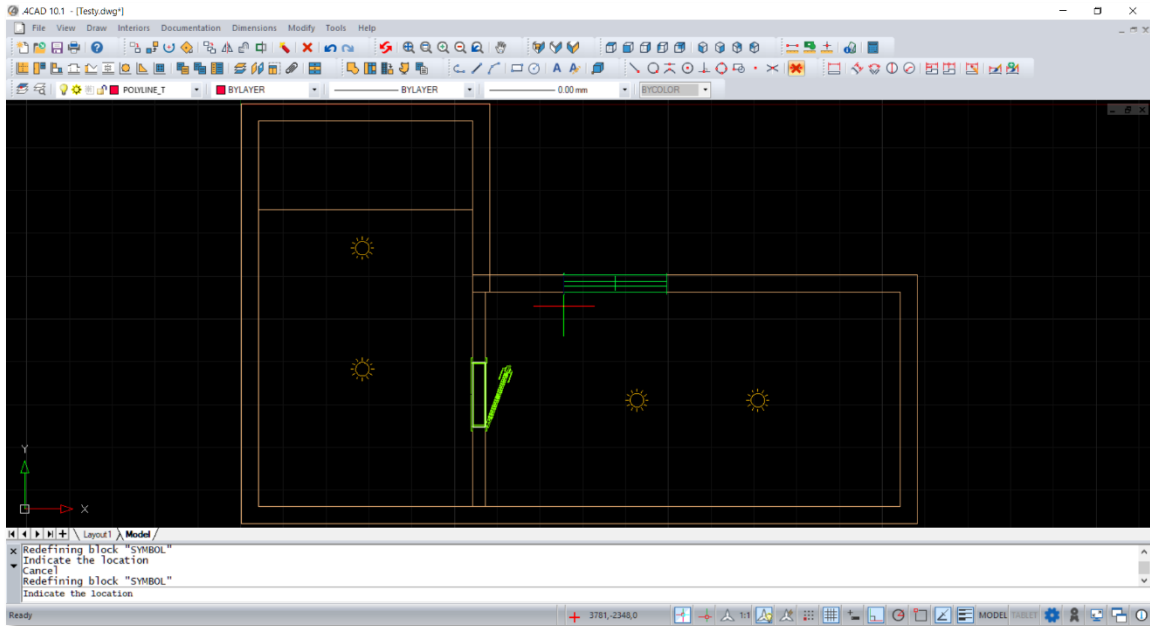## 4.3.5 Inserting a window model into the project

Fig. 38 - Indicate the location of the window insertion

The model selected and adjusted in the earlier steps can now be inserted into the project. The first step is to specify the place where the window is to be inserted. To do this, use the 'Indicate the location' button at the bottom left of the screen. After clicking it with LMB, the program will display a view of the environment and a green door symbol, which should be moved to the appropriate place along the selected wall (Fig. 38). To confirm the selection of the indicated place, click on it with LMB.

The program will display the window of the Doors and Windows module again. The user can now specify the position of the window on the wall more precisely. In the *Selected model* panel, a new section named *Position on the wall* has appeared above the *Window properties* (Fig. 39). Here you can change the position by entering distances from the corner of the wall (distance given in mm), and also specify the depth of embedment in the wall. There is also a parameter 'Insertion level', through which you specify the distance from the floor to the insertion point of the window, i.e. the bottom edge of the window.

After checking the door position, you can still use the 'Opening [*]' parameter to open the window leaf before inserting it. This is a new function available for both door and window models. For windows, the opening is set for each leaf separately. The option is available after selecting a leaf on the *Model preview*, in the *Leaf* section of the *Selected Model* panel. Depending on the selected window model (its construction), the leaves can be set to 'Opening wide [*]' or 'Tilt opening [*]', or only one of these two types.
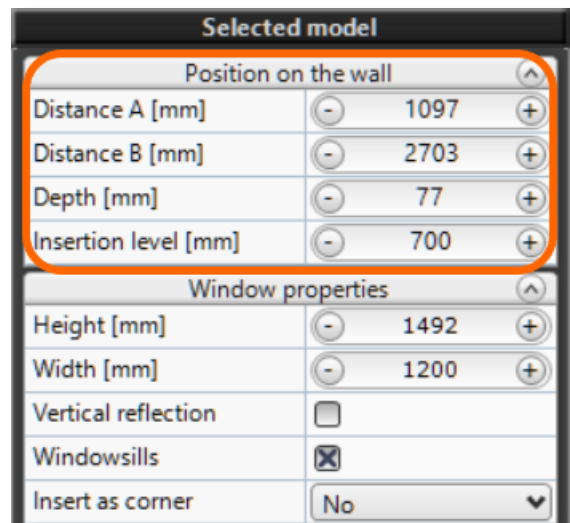

Fig. 39 - Indication of the position of window model on the wall

At the bottom of the Selected model panel, the 'Insert' button has become active (Fig. 40), which was previously grayed out and could not be clicked. Clicking LMB on this button will complete the process of inserting the window, which will be placed in the

previously indicated location. Inserting a window automatically ends your work with the Doors and Windows module. You can now move on to inserting the next model.
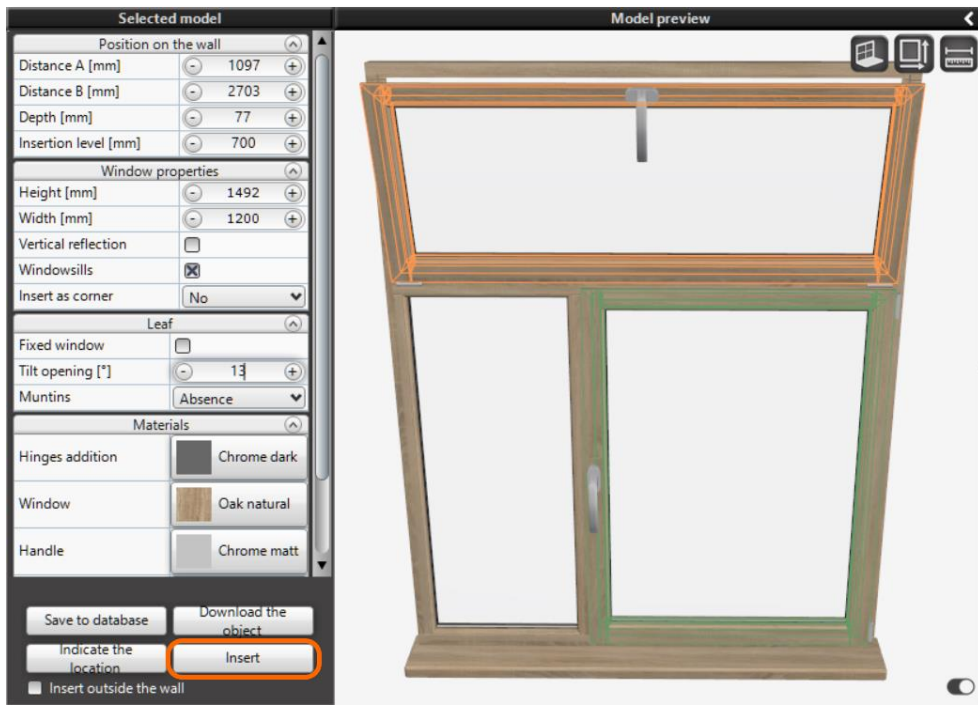

Fig. 40 - To insert a window, use the 'Insert' button

4.3.6 Inserting of L-shaped windows

L- shaped windows are a new type of window available in the Doors and Windows module. These are windows designed to be inserted at the junction of the roof and vertical wall, and consist of a vertical leaf and a roof leaf set at an angle. Windows of this type allow better illumination of the room. In the database of windows they are placed in a separate category *L-shaped*.
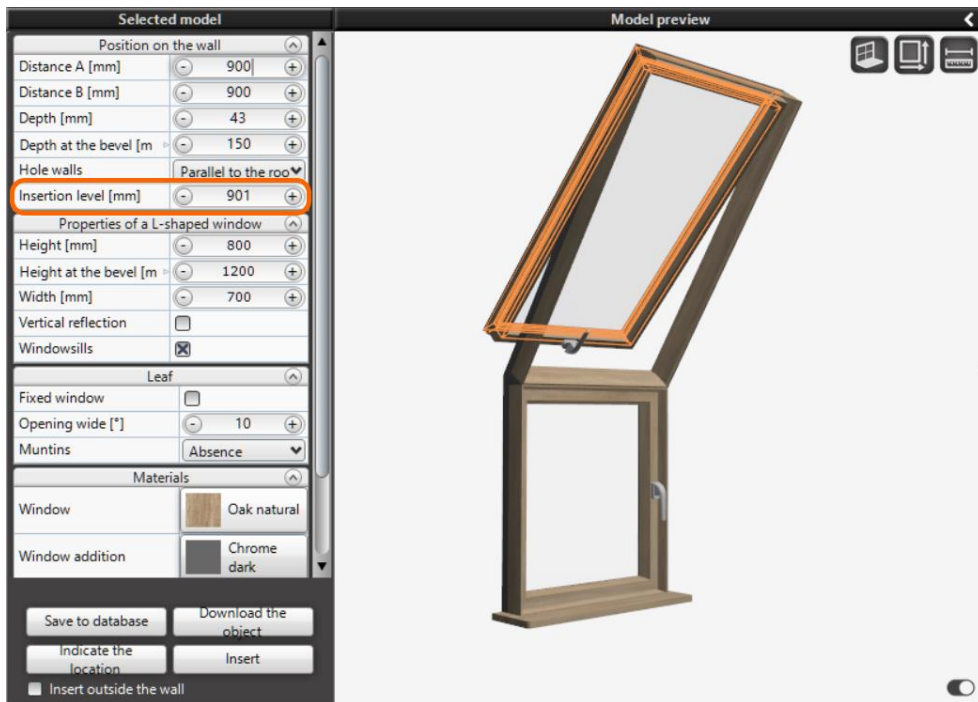

Fig. 41 - Inserting L-shaped window - insertion level

The project inserts such a window on a wall with an existing bevel. The angle of the window automatically adjusts to the angle of the bevel. When inserting L-shaped window, it is necessary to keep in mind the level of the window insertion. This parameter

determines the distance between the floor and the bottom edge of the window (vertical leaf). The ability to change the level of insertion is located in the *Position on the wall* section of the *Selected model* panel (Fig. 41).

4.3.7 Inserting a roof window

Roof windows, otherwise known as skylights or roof lights, are in the *Roof* category. Such windows are inserted on an existing bevel. When inserting a window, its angle automatically adjusts to the angle of the bevel.

As with L-shaped windows, so with roof windows, it is necessary to pay attention to the level of window insertion. For roof windows, this parameter determines the distance between the bottom edge of the window dropped on the bevel plane and the bottom edge of the bevel, as shown in the attached illustration (Fig. 42).
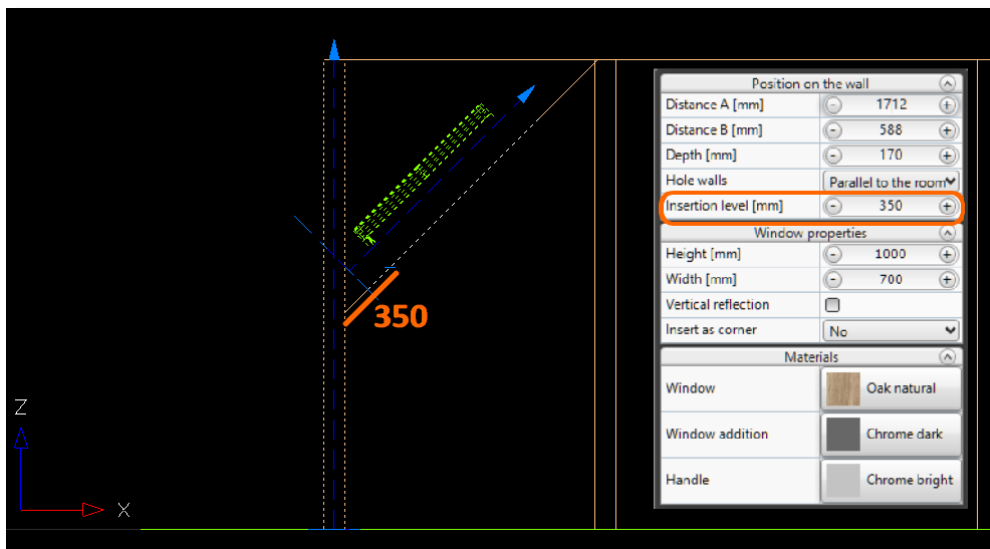

Fig. 42 - Roof window insertion level

For roof windows, note the additional option in the *Position on wall* section in the left panel. It is located above the 'Insertion level' and determines the construction of the window recess walls. This parameter is called 'Hole walls' and appears as a checkbox with two possible options. The first option - 'Parallel to the room' - means that the bottom wall of the window opening will be parallel to the room wall, and the top wall of the opening will be parallel to the ceiling. The second option - 'Perpendicular to the bevel' - means that the walls of the window opening will be placed perpendicular to the plane of the bevel / roof surface. The differences between the two options can be seen only when you get to the visualization. They are presented in the following illustration (Fig. 43). On the left side of the illustration, the appearance of the window and window recess with the option selected for the walls of the opening 'Parallel to the room'. On the right side of the illustration, the appearance of the window recess when the option 'Perpendicular to the bevel' is selected for the walls of the opening.
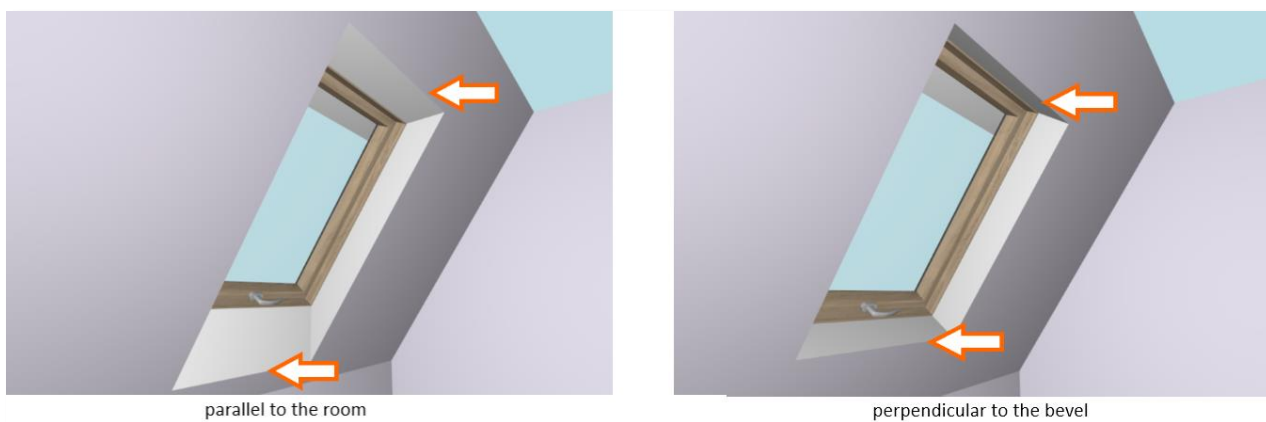

Fig. 43 - The appearance of the walls of the roof window opening in the visualization

4.3.8 Inserting window outside the wall

In some cases, there may be a need to insert a window outside the wall. To meet such situations, a mechanism has been implemented to insert windows in a free way. It should be remembered that the program does not cut holes in the wall when inserting a window in a free way.

To insert a window outside the wall, select the 'Insert outside the wall' checkbox at the bottom of the *Selected model* panel by clicking on it with LMB (Fig. 44). When the checkbox is selected, the 'Indicate the location' button will become inactive, instead the 'Insert' button can be used. After clicking LMB on this button, the user will be taken to the dot4CAD environment, and a green window outline will appear in place of the cursor to insert it anywhere in the project.
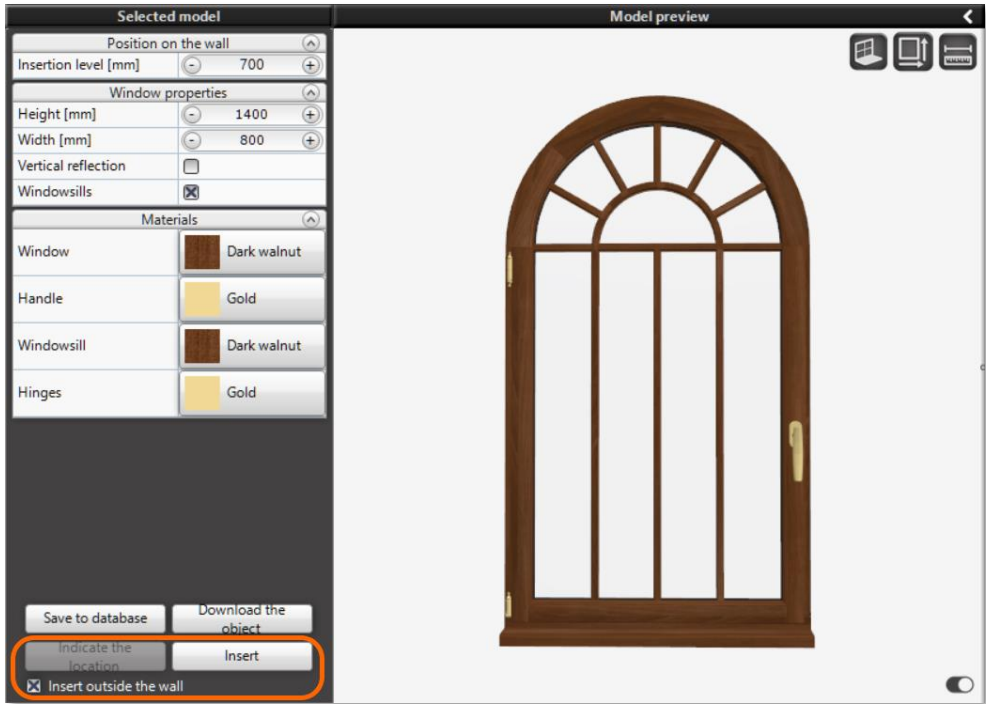

Fig. 44 - Inserting a window outside the wall

4.3.9 Other notes on the insertion of windows

In addition to the category of corner windows, of which more than a dozen models have been added in the new Doors and Windows module, a function for inserting regular window models as corner windows has also been implemented. It is available for most standard window models. The 'Insert as corner' function can be found in the *Window properties* section of the *Selected model* panel. When you click on the field, a selection list will expand allowing you to specify how to insert the window as a corner window (Fig. 45).
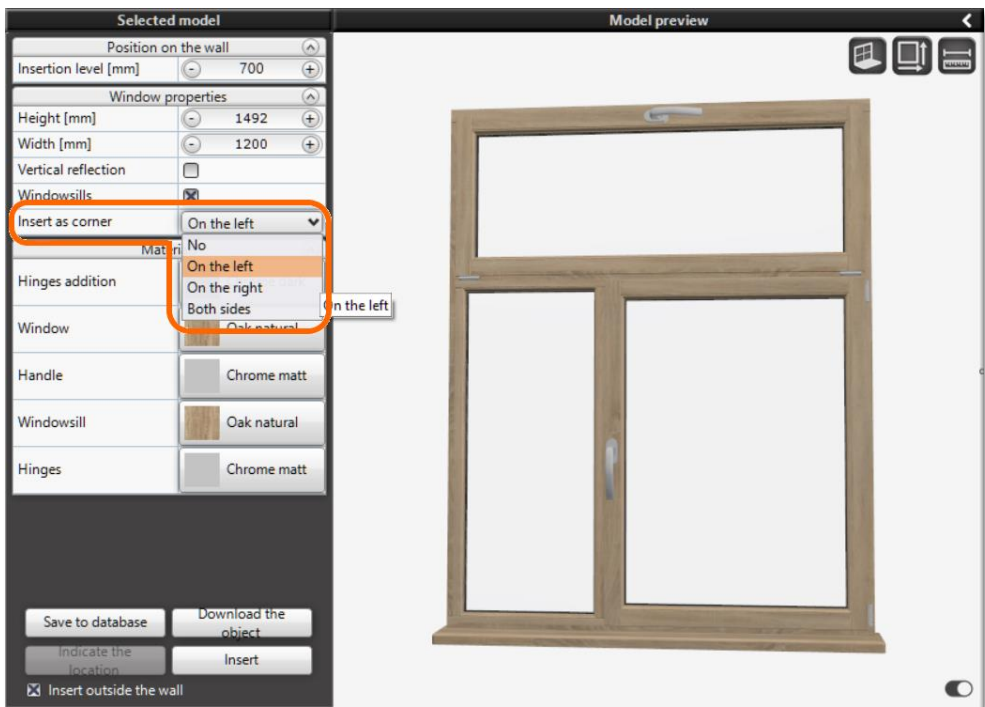

Fig. 45 - Inserting window as a corner window

After inserting a window at a corner (e.g., on its left side), you must then select a second window model to insert on the other side of the corner (in this case, on the right). If the 'Both sides' option is selected, the window model will be stretched to fill the

entire width of the wall between the two corners, and windows can be inserted on either side of it, creating a two-sided corner window. This allows the user to create the exact window layout he needs from existing models.

The mechanism for inserting a window as a corner is combined with another new functionality in the Doors and Windows module. This is the ability to attach one window to another, without leaving a gap between them. The inserted window is attracted to the existing one in the project - a field with a yellow outline appears in the environment, indicating the attraction to an already existing object (Fig. 46).
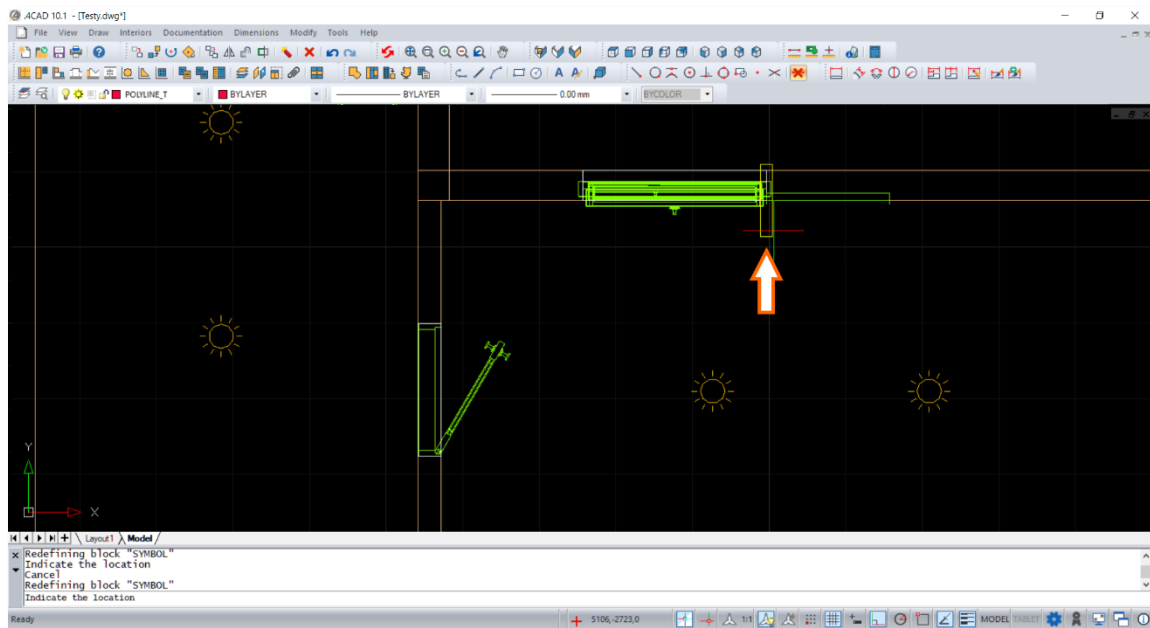

Fig. 46 - Place of attraction to existing window marked with yellow outline

It should be added that the program automatically detects overlapping windows. If this happens, the inserted outline will turn red to warn against collision of objects.

4.3.10 Downloading a window from the project

Usually several of the same window models are inserted in projects. This can be helped by another of the functions of the Doors and Windows module, which is downloading an object already existing in the project. This is done with the 'Download object' button located at the bottom of the *Selected model* panel. After pressing the LMB button, the user is taken to the environment, where they should click on the object to be downloaded. The program copies the settings of the selected object and displays the model in the module window. The user can edit the downloaded model (e.g. open/close the window) or proceed to indicate where to insert it into the project.

4.4 Editing the inserted window model

The window model inserted into the project can be edited. To do this, you can double-click LMB on the inserted model or click on it with the right mouse button (RMB) and select *Edit* from the pop-up menu, that will appear on the screen. After entering the editing mode, the window of the Doors and Windows module will be displayed, with a slightly changed appearance (Fig. 47).

In the left Selected Model panel, the function buttons at the bottom of the panel have changed. Instead of the 'Indicate the location' and 'Insert' buttons, there are now 'Confirm' and 'Cancel'. The list of available models in the top panel also changes. Only those models that the edited model can be exchanged for are visible, e.g. in the case of corner windows it is possible to exchange only for another corner model. The attached illustration shows that there are no available models in the *Standard* category.

After making changes to the model, such as opening or closing a window, swapping to another model, etc., confirm the changes with the ' Confirm' button. If the changes are to be rejected, use the 'Cancel' button.
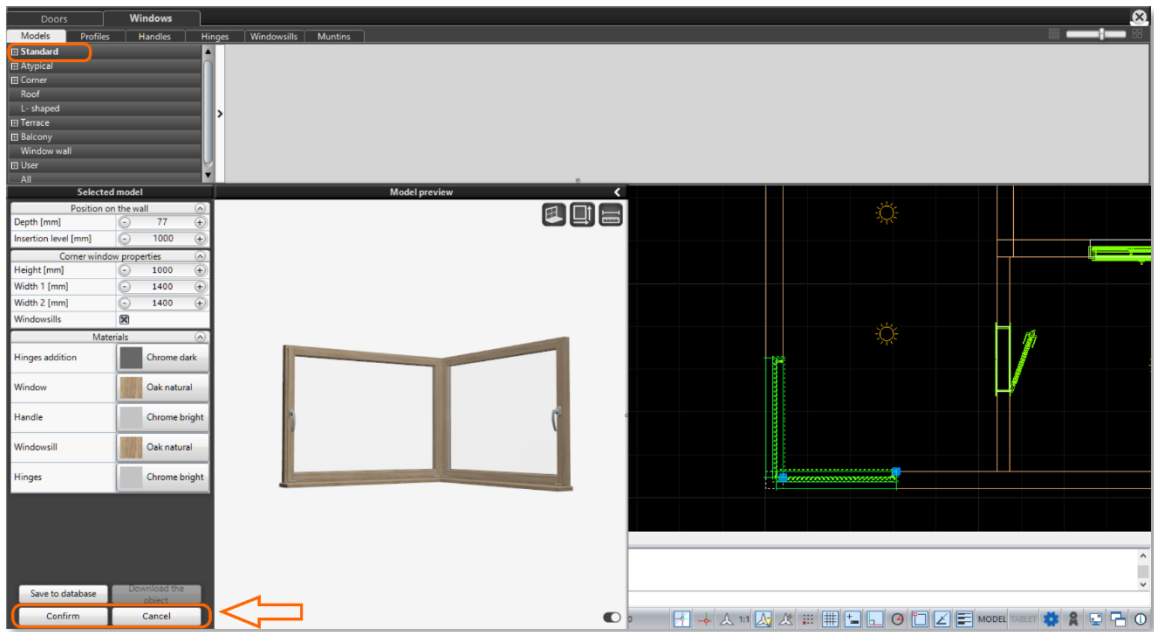
Fig. 47 - Window editing window with changed buttons

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