Guide and manual for

ArchiVISION OFFICE for REVIT

Info

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Under no circumstances is MCS liable for any damages (including, without limitation, damage due to loss or loss of earnings, business interruption, loss of information or other economic and / or image losses) deriving from the use of the program, even if MCS has been warned of the possibility of such damages.

All archives, price lists, projects, and bills of quantities delivered at the same time with the software will always be considered files as didactic and demonstrative examples.

The user must always evaluate and check the actual correctness of the documents generated in all their parts, being himself the only person responsible for the accuracy of the documents and the results obtained from their use. The sample files, or part of them, must not, in any way, be reported and used in other procedures.

MCS **does not guarantee** the operation of the program following future hardware and software developments (computers, operating systems, etc.), as well as its compliance with future legal provisions

relating to the matter covered by the program itself. In this case, if available, the user must purchase an updated version of the program.

DISPUTES

The Court of Turin is competent for any legal dispute between the parties

MCS Software

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Technical assistance

The Technical Assistance service is provided according to the conditions shown on the last page of this manual.

Chapter A

Introduction

The purpose of this manual is to provide the User with the necessary support to acquire adequate conceptual and practical knowledge of the procedure, as a valid integration to the multimedia videos supplied with the software.

The specific features of the program will be described, supplemented, if necessary, by appropriate examples and illustrations.

The information regarding the installation of the program is reported in chapter 2.

A.1 ArchVISION OFFICE for REVIT solution

The ArchVISION OFFICE for REVIT solution intends to allow fast, dynamic, and reliable quantity take-offs by interfacing with Office and Revit;

ArchVISION OFFICE for REVIT is a simple but very powerful tool that helps the technician in the generation of bills of quantities of a completed project.

An operator who is familiar with the features of Revit will find in ArchVISION OFFICE for REVIT an extraordinary tool to create, in a simple and very fast way, quantity take-offs of projects carried out with Revit.

A.2 ArchVISION OFFICE for REVIT, Office, and Revit

The ArchVISION OFFICE for REVIT solution has the objective of addressing the Quantity Take-off-Project topic in an extremely simple, innovative, and powerful way.

The computation of an architectural project or a simple CAD drawing has always entailed problems in terms of speed, reliability, and unique link between the drawn entities and those computed.

In particular, by modifying the graphical elaboration, a misalignment of the calculation was generated with the need for complex and costly manual revisions in the latter.

Furthermore, manual revisions to the calculation often lent themselves to incorrect interpretations, with the consequent obtaining of incorrect or incomplete evaluations, measurements, and computations.

ArchVISION OFFICE for REVIT has a series of tools developed specifically to add to Revit a series of features and utilities specifically dedicated to this problem.

Good knowledge of Revit and Office is required to appreciate ArchVISION OFFICE for REVIT and to fully exploit its functionalities.

Although ArchVISION OFFICE for REVIT can independently prepare everything necessary for the creation of a complete bill of quantities it should be noted that to produce the calculation document it is necessary to connect to Office.

It should be noted that ArchVISION OFFICE for REVIT can work even if Office is not installed on the computer. In this case, all the functionalities of preparing the bill will be allowed (creation, editing, and modification of Price List Items, measurements with formulas containing variables dependent on graphic objects, etc.), the summary of the calculation prepared and changes to any associations between measurements and graphic entities.

However, it will not be possible to export and generate the actual calculation.

The export will always be available and possible in Office

A.3 ArchVISION OFFICE for REVIT: Concepts and Philosophy

Warning!

Before tackling demanding and important projects, it is advisable to familiarize yourself with the product by exploring it thoroughly in all its functions in the 2D, 3D, and Computing field, simulating the concrete design and computation of a project, perhaps already completed and computed in precedence with traditional systems.
The concepts and simple, innovative, and revolutionary idea of ArchVISION OFFICE for REVIT are summarized and implemented in this introduction that we recommend that you always keep in mind which basic "Concept and Philosophy" to familiarize yourself with.

ArchVISION OFFICE for REVIT in brief:

• A project generated by ArchVISION OFFICE for REVIT is a 100% Revit project.

• The connection between the Office "Price List Items" and the Revit entities takes place in two specific ways, through direct associations on the entities present in the graph (Instances) or associations to Revit entity families. (extremely productive and advisable mode)

• The “Family” represents a set of graphic information, of technical and descriptive characteristics, of customizable parametric information.

• The “Families” can also contain and refer to one or more items in the Price List and be associated with one or more graphic entities present in the drawing.

• Each Revit entity or family can be associated with one or more Price List Items with a simple Drag & Drop operation.

• Each graphic entity containing one or more computation associations will always be identifiable by its “unique Id”.

• The use of the "ArchVISION OFFICE for REVIT - Entity Id" family will also allow you to view and print labels containing the unique Id of the individual instances.

• The univocal link will allow dynamic and reliable computations through a family or utilizing a direct connection; after modifying a graphic entity, the calculation generated will also be immediately updated by simply pressing a button.

• ArchVISION OFFICE for REVIT creates a unique link by connecting price list items or families to the graphic entities (to which it is possible to link Price List items back) allowing a huge saving of time and high productivity.

• Making associations to the families of graphic entities are preferable (if possible) to make the work more productive, to assign them both a series of graphic characteristics, and the appropriate Price List Item with a single operation.

• ArchVISION OFFICE for REVIT is a very powerful tool to aid in the design and computation, topics that are often extremely complex and full of problems.

A good understanding of the program's features will make your work much easier and more productive.

It is therefore advisable to carefully consult the documentation supplied with the product (manual and multimedia films available on the program CD-ROM or the MCS Software YouTube channel).

Attention!

MCS Software does not assume any liability regarding the content of the processes obtained, the data contained in the tables, and the computations generated.

Chapter B

Installation (File downloadable from Internet)

ArchVISION OFFICE for REVIT program consists of the following parts:

• Quick Start (pdf);

• Installation software (exe) containing:

• Program (exe and dll);

• User Manual (pdf);

• Some sample price lists (xlsx)

• Some example Revit projects (rvt)

• Some complete Example Computes (xlsx, docx)

• Loadable family "ArchVISION OFFICE for REVIT - Id Entità" (rfa)

• Product brochure (pdf)

• Some documents and reference tables (pdf)

• Order form (pdf)

To install ArchVISION OFFICE for REVIT you must be an Administrator of the machine or be a User with Administrator privileges to proceed with the installation of the Program (see § 2.2);

The following paragraphs describe in detail the operating methods for installing the program that is identical even for the versions downloaded from the internet.

B.1 System requirements

ArchVISION OFFICE for REVIT can only be used with the hard disk configuration, it cannot be used on a USB key.

Attention!

The requirements listed below are purely indicative as they can be modified due to any hardware and software evolutions. The user is required to check for any changes by consulting the site:

https://bim.mcs-software.it/en/

In any case, the minimum system requirements required for ArchVISION OFFICE for REVIT to work are the same as those required by Autodesk for Revit to work.

The prerequisites for the functioning of the program are indicatively the same as those required by the Revit software

• Autodesk Revit 2017 in Italian, English, and Spanish and subsequent release.

• To take full advantage of the calculation functions (Drag & Drop, style associations, entities, etc ...) Microsoft Office.

B.2 Software installation

The installation of the software on the hard drive is performed automatically by doing the following:

• turn on the computer and wait for Windows to start;

Attention!

Before proceeding with the installation make sure:
▪ *that any other application in use is closed;*
▪ *that you have accessed the system with "Administrator" privileges;*
▪ *to have temporarily disabled any Antivirus software in execution;*
▪ *that you have installed and started Revit at least once.*
▪ *if installed, you have started Office at least once.*
▪ *We recommend configuring UAC user control at the minimum level (never notify)*
▪ *Start the installation as "System Administrator"*

• CD-ROM owners can insert the program CD-ROM in the appropriate reader and wait for the installation program to start;

• Those who have the version downloaded from the Internet can select the downloaded executable file with a double click

Attention!

If the installation program DOES NOT start, please select the Run option in the Windows Start button menu and type: X: \ SETUP.EXE in the dialog box that opens. Please note X is the letter that identifies your CD-ROM drive.
Pressing the OK button of the dialog starts the installation program.

• press the Next button in the first window ("Welcome ...") of the installation program to move to the next window;

• proceed by carefully following the instructions provided by the installation program, all the dialog boxes proposed during installation will be illustrated below.

Attention!

During installation, you can change the folder proposed for installing the program (C: \ Program Files \ ArchVISION OFFICE for REVIT).
It is recommended NOT TO MODIFY the folder proposed for installing the program (C: \ Program Files \ ArchVISION OFFICE for REVIT).
In case you decide to install the program in a different folder, possibly choose an empty folder created specifically, for example, "D: \ QTO \ ArchVISION OFFICE for REVIT"

B.2.1 License to Use Header

ArchVISION OFFICE for REVIT program is available in demonstration mode and can be downloaded for free from the Internet directly from the manufacturer's website, each installation will subsequently be customized. This customization consists of writing a unique serial number linked to the location where the installation was performed within the program.

While using the program, the generated "Installation Code" will be displayed, it will allow any purchase at any subsequent time and the Company's data and the proposed Installation Code must be specified only when requesting the activation code.

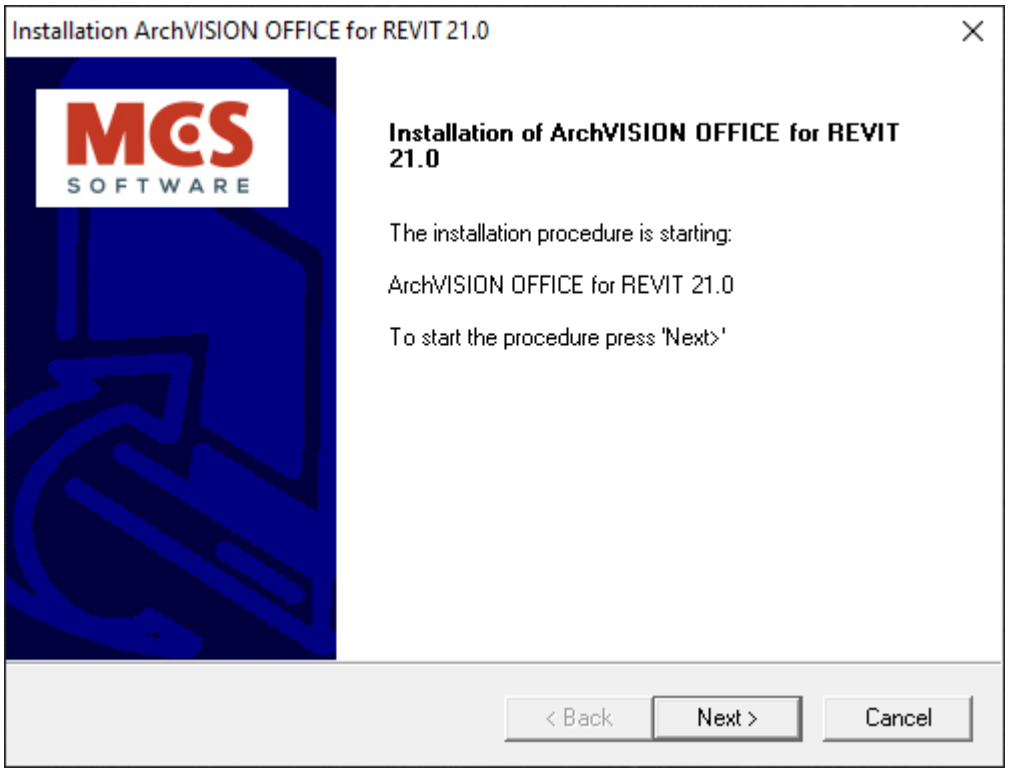
Important!

To receive the Installation Code, the prepared form must be downloaded from the MCS website by completing it and subsequently sending it to MCS with at least the following data:
▪ *Company name;*
▪ *Address - ZIP code - City - Province;*
▪ *Telephone - E-mail;*
▪ *Any reseller of the Program or if downloaded from the Internet,*
▪ *Reference name;*
▪ *VAT number or tax code;*
Refer to the website (https://bim.mcs-software.it/en/) for further information

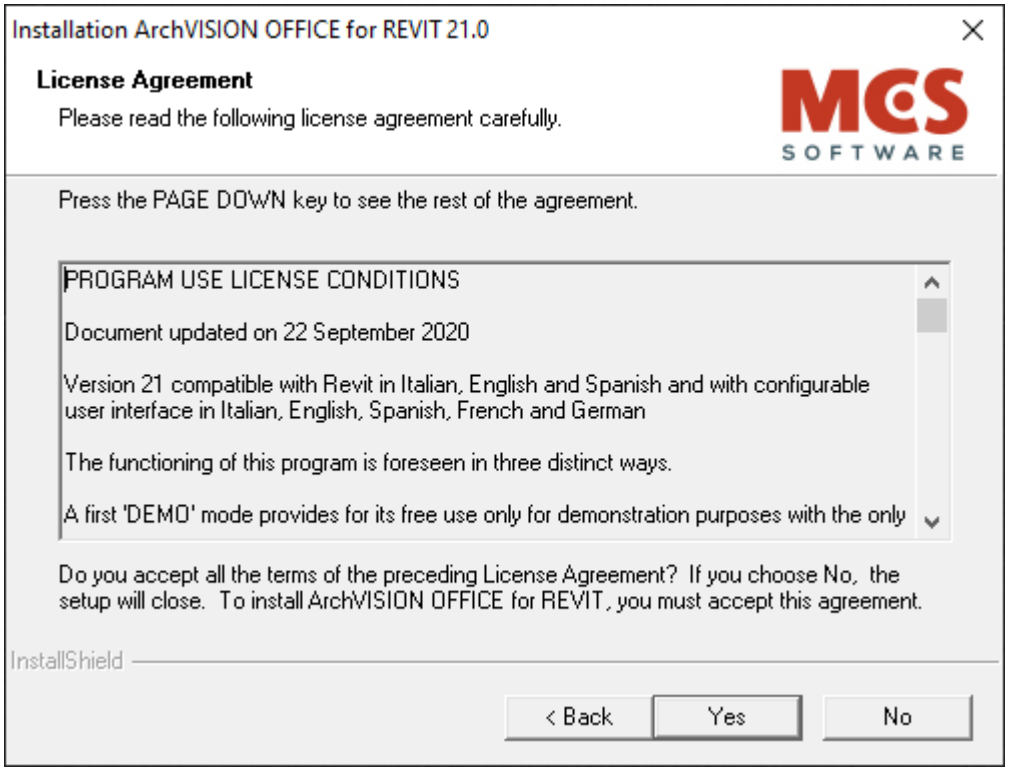
To continue with the installation, just press Next and carefully follow the instructions provided by the installation program.

Below will be listed, purely as an indication, the individual screens relating to the installation procedure, identical for both the versions on CD and those downloaded from the internet.

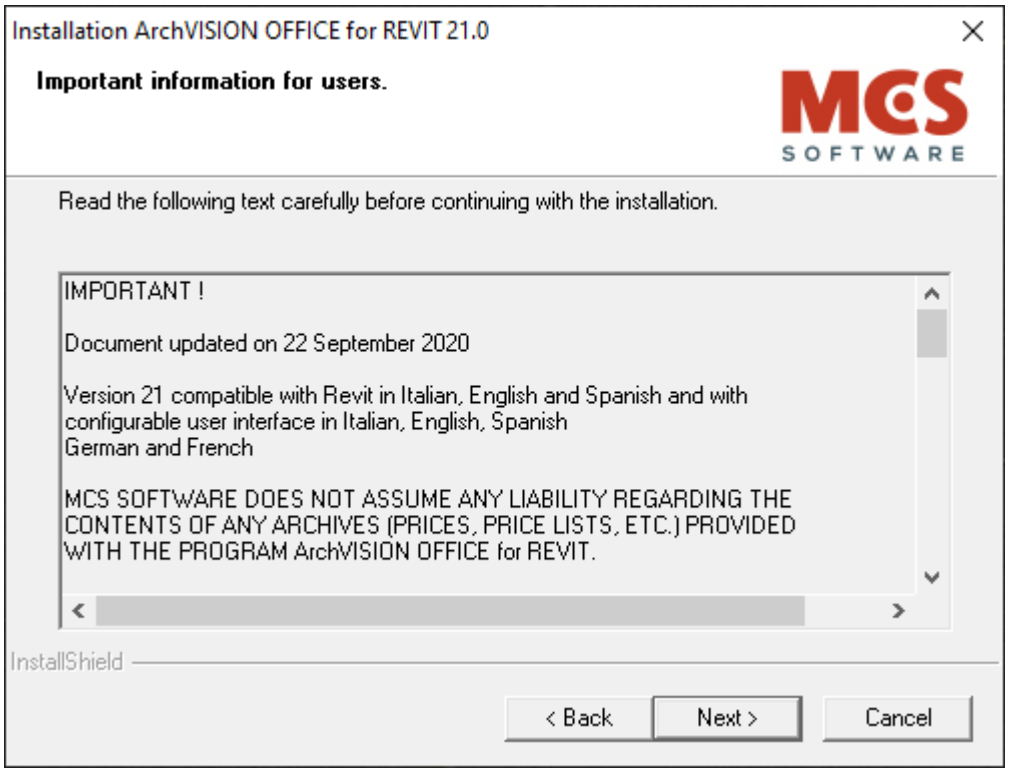
The initial introduction screen:



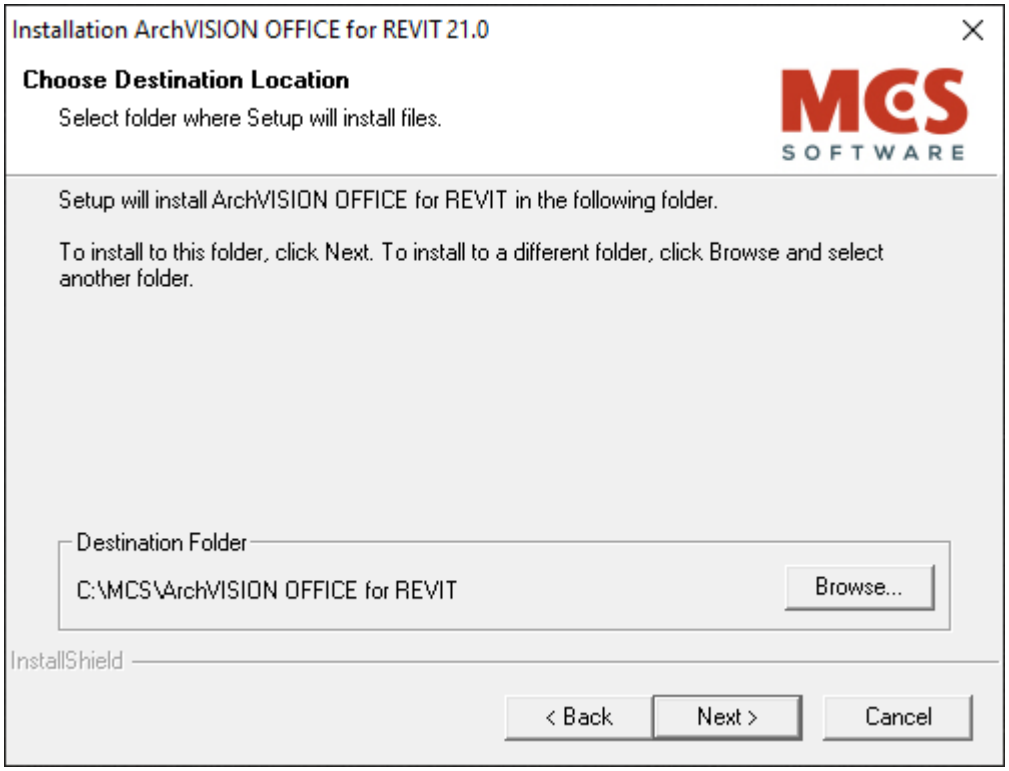
The license of the software recommended being read to be accepted in full by pressing "Yes":



Some important information for the correct operation which we recommend reading:



Selecting the installation path:



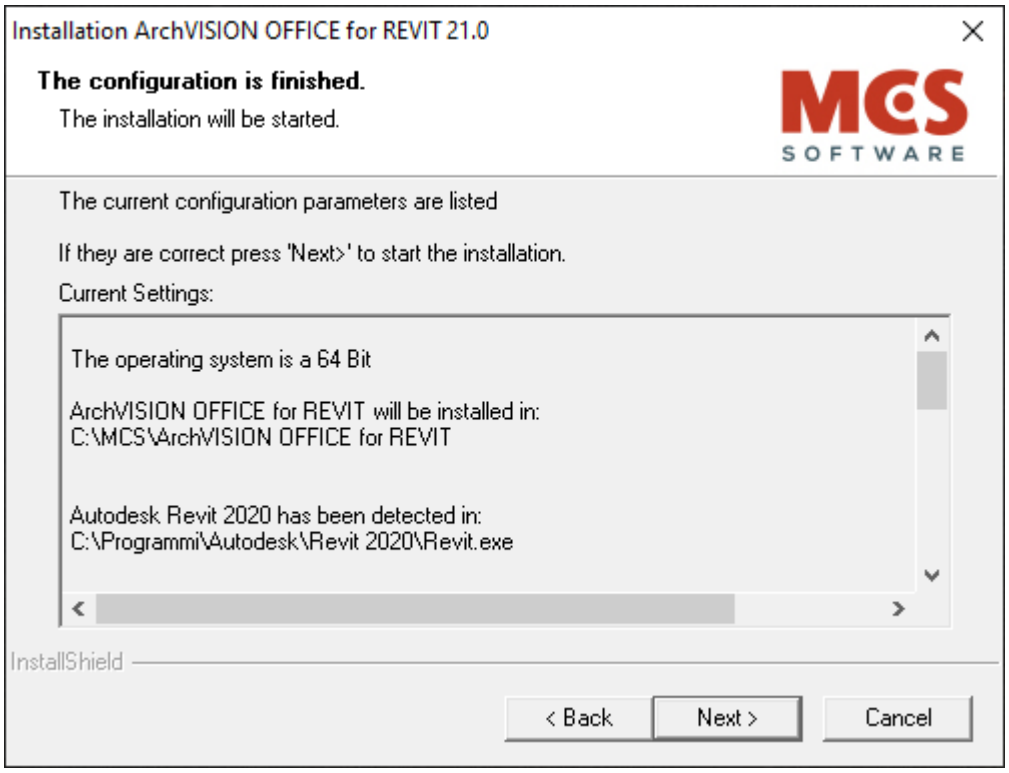
Attention!

During installation, through this window, it will be possible to change the folder proposed for installing the program (C: \ MCS \ ArchVISION OFFICE for REVIT).

It is recommended not to change the folder proposed for installing the program (C: \ MCS \ ArchVISION OFFICE for REVIT \).
If you decide to install the program in a different folder, possibly choose an empty folder created specifically, for example, "D: \ MCS \ ArchVISION OFFICE for REVIT"

Summary of information and installation parameters:

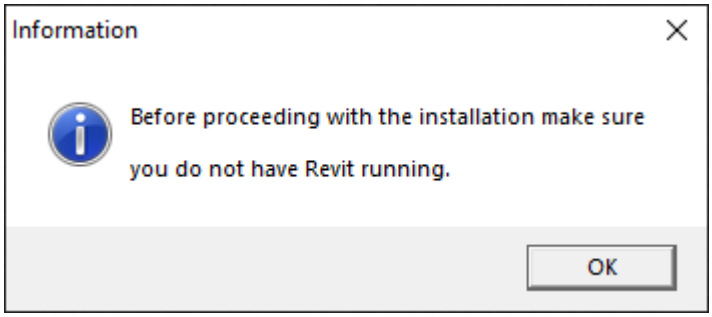
If they exist, Office software detected and Revit detected will be indicated.



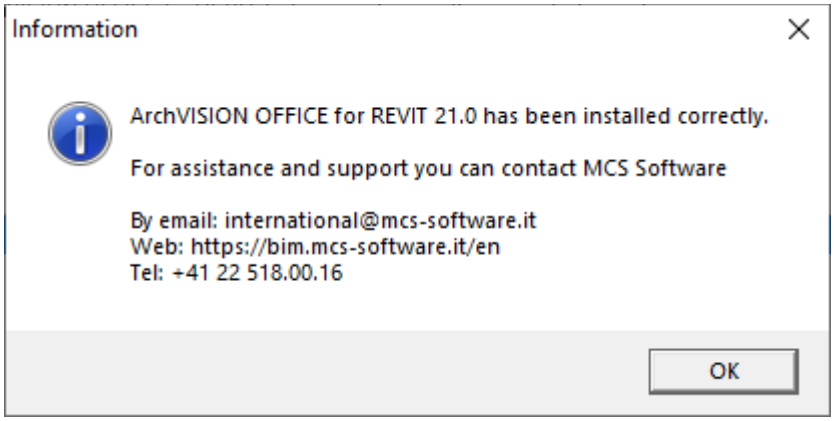
Important!

ArchVISION OFFICE for REVIT can work even without the presence of any Microsoft Office software, however, it is recommended to use it only in the presence of Office software, only in this case it is possible to generate dynamic calculations in real-time.
For more information about Office refer to the site of the manufacturer Microsoft. (www.microsoft.com)

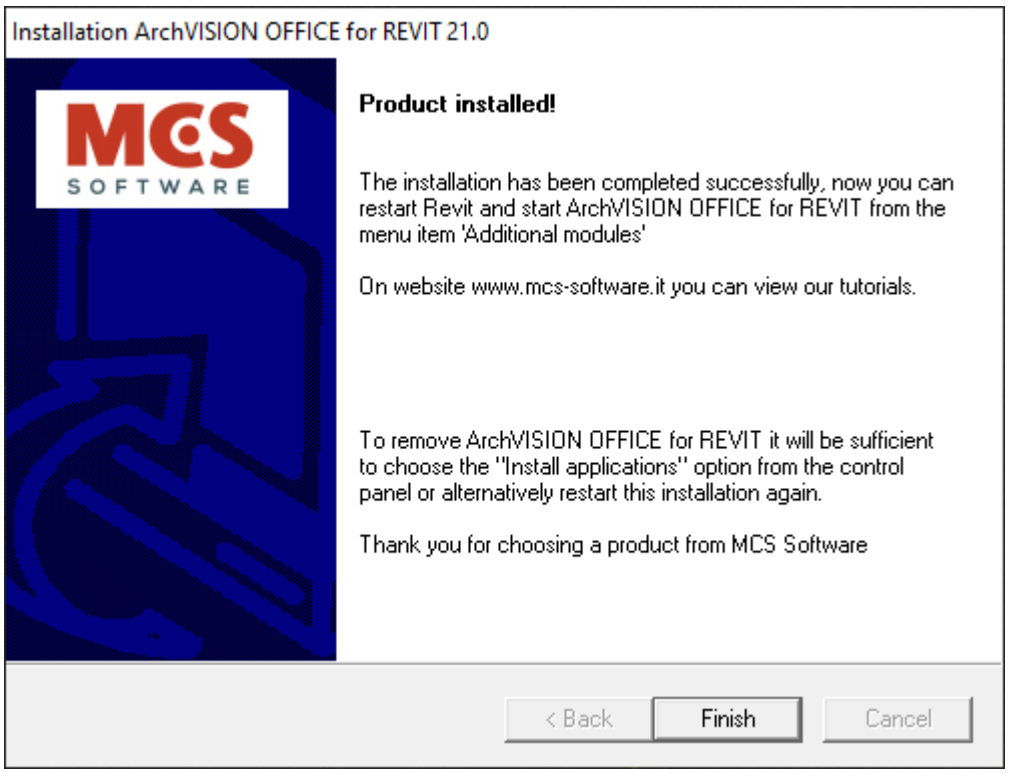
Notice to the user asking to proceed only with Office and Revit regularly closed:



Notice for completed installation:



Final summary after installation:



Important!

To remove ArchVISION OFFICE for REVIT you can restart the installation again or choose "Add applications" from the control panel of your operating system and then "Remove programs" by choosing ArchVISION OFFICE for REVIT.

B.3 Software updates

MCS provides the following types of program updates:

Version Updates: Version updates are subject to a fee and MCS software will inform its users of their availability and distribution methods.

Service Pack: small updates of the same version of the program that are made available free of charge to users on the MCS software website (https://bim.mcs-software.it/en/), without setting up and shipping costs in this case, just select the Updates from the Internet icon in the ArchVISION OFFICE for REVIT toolbar to connect to the site page from which you can receive more information on the update;

Important!

Availability of Updates, Service Packs, and other important communications are published in preview on the Mcs software website (www.mcs-software.it) which it is advisable to visit periodically.

B.4 User manual

This Installation Manual and the User Manual are provided in PDF format and can be downloaded, viewed, and printed using the Acrobat Reader program or any other equivalent software.

Attention!

To consult and / or print the ArchVISION OFFICE for REVIT User Manual, a PDF viewer must be installed. ArchVISION OFFICE for REVIT is not equipped with a PDF viewer that must be downloaded by the user independently
Any updated versions of this manual and the User Manual are available on the website of the MCS site which can be accessed by selecting the Internet updates icon in the program toolbar.

Chapter C

Project Quantity Take-off

This chapter illustrates the specific functionalities and operating methods of ArchVISION OFFICE for REVIT for the creation of a dynamic quantities' take-off linked to the graphic entities of the CAD elaboration.

In particular, the steps to create a bill of quantities are described both with a direct connection with the Office program and independently.

It also illustrates how to take advantage of the powerful features made available by the Revit entity families.

It is recommended to read this chapter carefully before proceeding to create quantity take-off with ArchVISION OFFICE for REVIT to learn how to correctly operate this software feature.

C.1 Introduction and Recommendations

Although ArchVISION OFFICE for REVIT addresses and develops thematic issues related to the Bill of Quantities, it is not a computation program. The purpose of the program is to make the quantity take-off of the graphic objects of the architectural project simple and automatic.

To obtain a complete bill of quantities it is, therefore, necessary to use a specific program for the quantity take-off.

Like any software, ArchVISION OFFICE for REVIT provides results directly linked to the inputs received: an incorrect value in the imputation phase leads to incorrect results.

It is recommended to pay close attention to the values entered during the preparation of the calculation.

It is also advisable, especially in the learning phase, to check the results obtained, to ensure that the program's calculation functions are used correctly.

C.1.1 Operational notes

ArchVISION OFFICE for REVIT when creating or associating the first measurement with a Revit entity or family generates a file with the ".rrf" extension and with the same name as the Revit project (.rvt file). To compute a Revit project with ArchVISION OFFICE for REVIT it is, therefore, necessary that it is saved on disk (that is, it must have a file name and a storage path). ArchVISION OFFICE for REVIT does not write any information in the Revit project (.rvt file) but generates an external file (.rrf file) containing all the information used in the calculation phase. it is therefore essential to remember to archive the .rrf file together with the Revit project, otherwise, the calculation would be irretrievably lost. If you want to reset the calculation it is sufficient, after closing ArchVISION OFFICE for REVIT, to delete the “.rrf” file associated with the project itself.

Attention!

In case the model name has changed the measurements are not available at the next reopening of the model. This is because the association between the Revit model and the .rrf file containing all the measurements has been lost and the two files have different names. The association can be immediately restored by renaming one of the two files to have the same name.

C.2 Design and Computation of Graphic Entities

It is necessary to link any necessary information to the computation to each object drawn to obtain the quantity take-off of the ArchVISION OFFICE for REVIT project.

It is possible to associate one or more Measurements to each element (Revit Object / Instance), in this context the term Measurement indicates the coupling of a Price List item with a composition given by the relative rows of measurement (see § C.5) from quantity take-off.

A Measurement can be associated with:

• to a Family of a Revit Object (Wall, Window, Door, etc ...)

• to a drawn Revit instance.

C.2.1 Association of a Measurement to a Family

ArchVISION OFFICE for REVIT allows you to specify, in a family (see § C.4.4), in addition to the morphological and geometric characteristics (heights, thicknesses, etc.) necessary for the generation of the project (depending on Revit), also all the necessary information for the computation of the Revit object according to the family to which it belongs.

All necessary information, such as price list item data and the composition of its measure lines, is assigned to Revit families through measures.

When requesting quantity take-off, the program detects the geometric, descriptive, and economic information (price) from the drawn objects and organizes them in an Office document according to the composition of the calculation lines defined in the measurements assigned to the families.

The operating procedures for assigning a Measurement to a Family are illustrated in § C.4.4.

C.2.2 Association of a Measurement to an Instance

A measurement (price list item and composition of its measurement row) can also be assigned directly to a Revit Instance.

Of course, it is recommended to use this feature only to link the necessary measurements to a few project instances.

Otherwise assigning measurements to objects through families is much more convenient and productive.

The operating procedures for assigning a Measurement to an Entity are illustrated in § C.4.2.

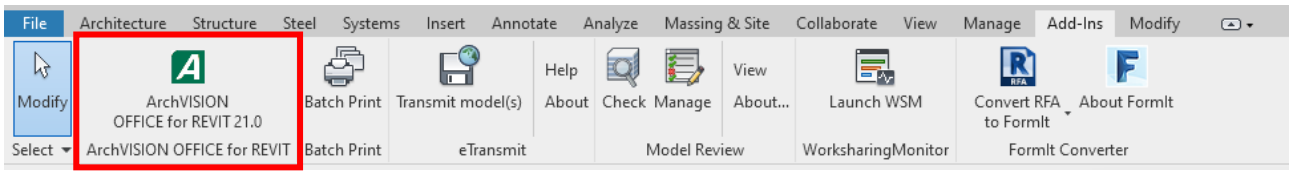
The ArchVISION OFFICE for REVIT features for obtaining the calculation is extremely advantageous. Quantity take-off of the project can be obtained immediately after carrying out the simple operations of linking the measurements to families and / or individual entities. Furthermore, immediate update of the quantity take-off can be requested after any modification made to the drawing or the family of objects.

The technician can finally devote himself completely to the design once he is free from the burden of drawing up and updating the drawings and the calculation of the project.

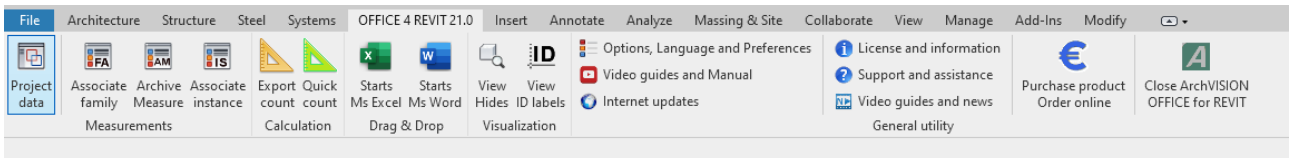
The following paragraphs will illustrate the operating procedures for obtaining the calculation with ArchVISION OFFICE for REVIT.

C.3 OFFICE 4 REVIT 21.0 toolbar

All the commands to start the calculation functions of ArchVISION OFFICE for REVIT are grouped in the "OFFICE 4 REVIT 21.0" Toolbar which can be activated by selecting "Add-ins" in the upper menu of Revit -> " ArchVISION OFFICE for REVIT 21 "as shown in the following image.



When ArchVISION OFFICE for REVIT is activated, the " OFFICE 4 REVIT 21.0" toolbar will be displayed, including the calculation functions that can be activated using the following buttons:



Project Data: activates the Project Data window in which it is possible to enter the general data of the project (see § C.10).

Associate Family: activates the Measurements by Family window where you can manage the measurements associated with the family of the selected entity and assign/remove measurements to the family itself.

Archive Measure: activates the window of the same name in which you can view and manage (create, modify, and delete) all the measurements of the project (see § C.4).

Associate Instance: activates the “Measurements by entity” window where you can manage the measurements that can be associated with the selected entity and assign/remove the measurements to the entity itself.

Export Count: computes the selected entities by allowing the user to choose how to export the quantity take-off.

Quick Count: calculates the units and exports the quantity take-off keeping the last used settings

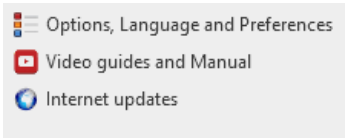
Start Excel: start / close Excel and the link between the latter and ArchVISION OFFICE for REVIT.

Start Word: start / close Word and the link between the latter and ArchVISION OFFICE for REVIT.

View Hides: hide the objects that have already been measured or that have yet to be measured

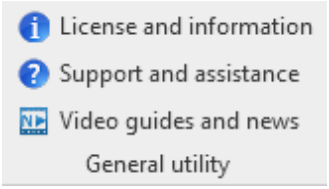
View ID labels: create ID labels for the objects that have been measured

Options, Language, and Preferences: open the dialog for settings and preferences and to set the language the operating environment of the calculation.



Video guides and Manual: open the MCS YouTube page with useful video guides to discover the product or open the manual online of ArchVISION OFFICE for REVIT.

Internet updates: with an active internet connection, you can access the program updates page on the MCS software website (www.mcs-software.it).



License and Information: Opens an Information Window profits on the License and the Program.

Support and assistance: request assistance and start a remote session

Video guides and news: link to the MCS site to be updated on the latest news and to have access to the video guides

Purchase Product online order: access the form to complete the purchase of the product

Close ArchVISION OFFICE for REVIT: close the software

C.4 Archive Measure: Measurements Window

Press the Archive Measure button on the toolbar to access the homonymous window.

The Archive Measurements window is the archive of measurements of the project in which it is possible to view and manage the measurements (items in the price list and composition of the related measurement lines) assigned or to be assigned to the styles and / or entities of the project.

In the Archive Measurements window, however**, it is not possible to assign a measurement** to a Family or Entity. A measurement can also be managed (created, and edited) not only through the Archive Measurements window but even directly in the Multi-Row phase of assigning it to one Family (see § C.4.4) or to an instance (see § C.4.2).

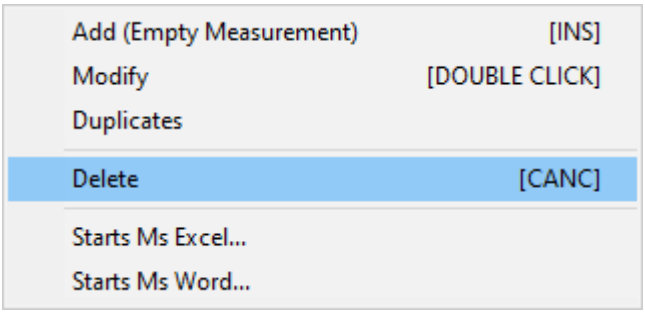
However, it is not possible to view and manage all measurements in these windows, but only those that can be associated with the type of entity or family for which they were created.

The Archive Measurements window, in addition to displaying all project measurements, allows you to:

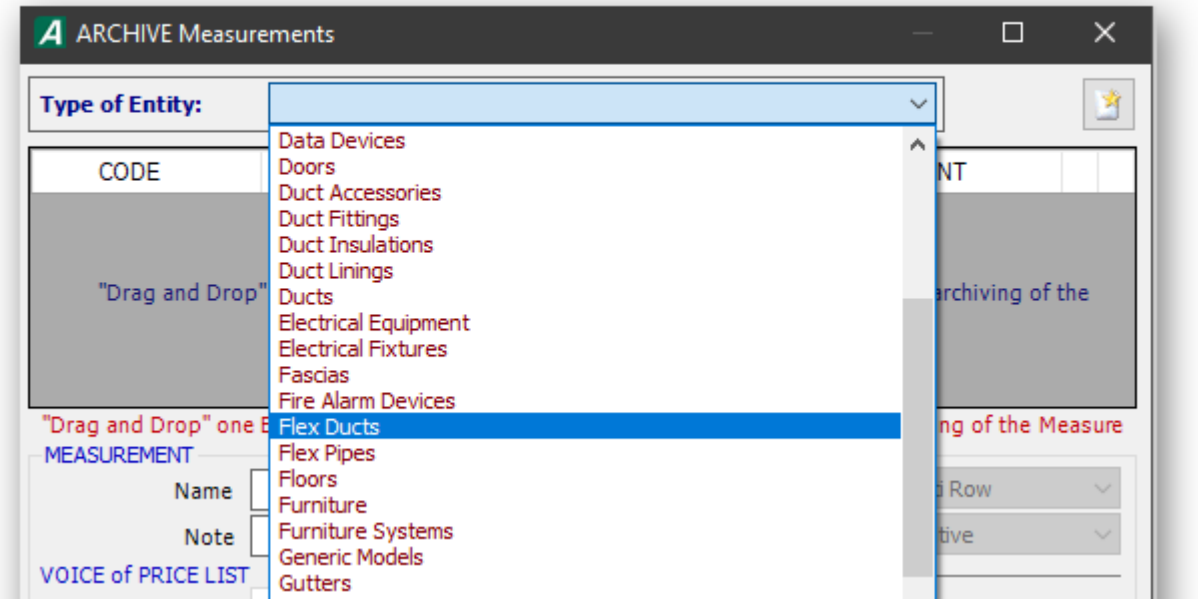
• create all necessary measurements before proceeding to their association with families or project instances;

• proceed to modify all the measurements linked to one or more families or entities without having to move to the same families and / or instances;

• delete measurements from the project so they will not be counted in final quantity take-off.



On the top bar of the Measurements Window there are:

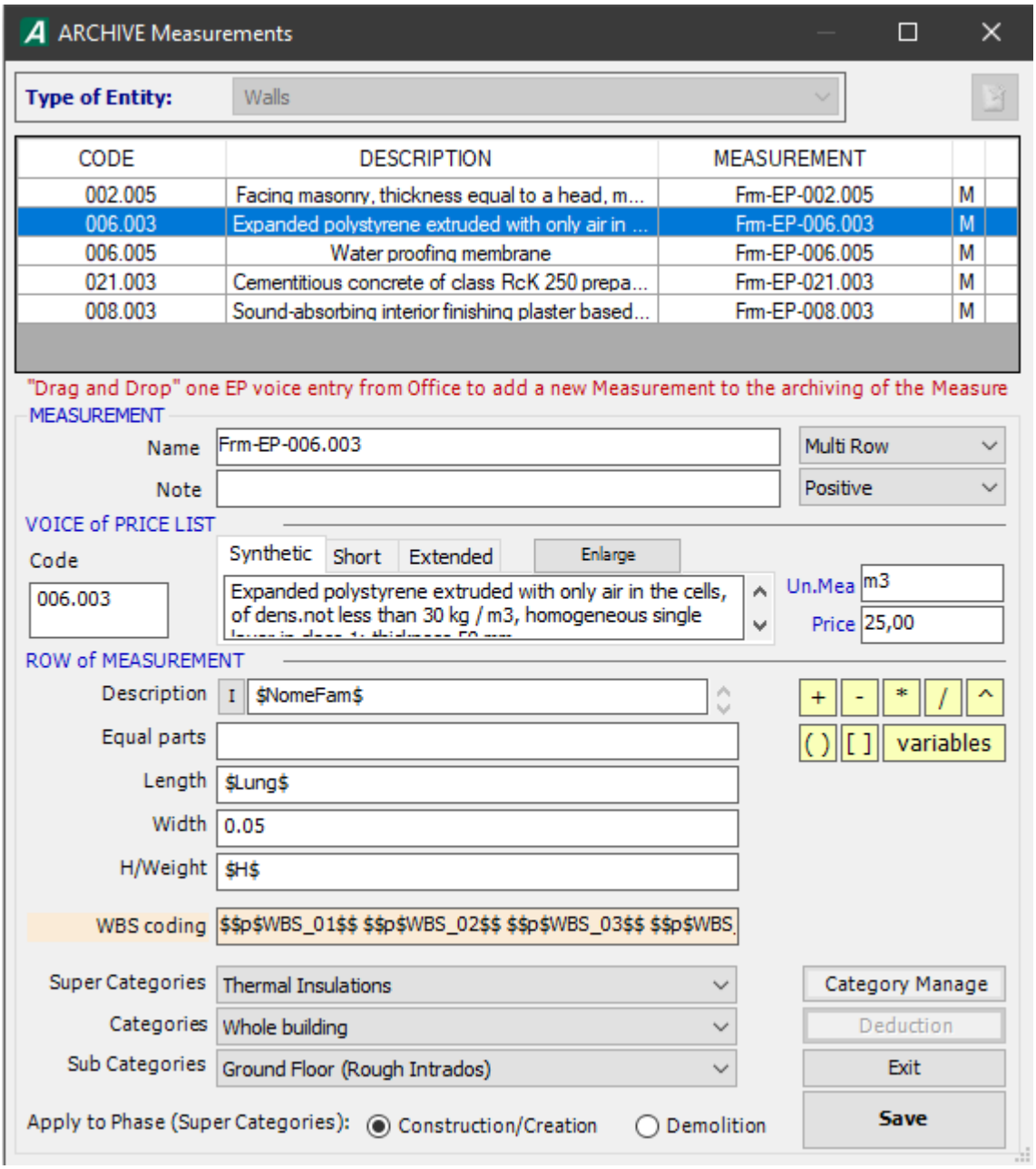


• the Type of Entity list box where you can choose the type of Entity to which the measurements to be displayed refer to;

 the Functionality button which activates the window functions menu (see § C.4.2);

Immediately below the tools described there is the grid in which the measurements relating to the type of Entity chosen are displayed.

The remainder of the window is occupied by the following sections with the fields in which the data of the measurement selected in the upper grid must be specified:



In this section there is a first list box where you can choose:

Multi-Row, if the quantity take-off of the entities associated with the selected measurement must be expressed using several measurement lines (see § C.6);

Single Row, if the quantity take-off of the entities associated with the selected measurement must be expressed in a single line (see § C.6).

Attention!

The Single Row option must be used ONLY in combination with certain variables (see § C.6).

In the second list box you can choose:

Positive, if the entity associated with the measurement must be calculated positively (see § C.6);

Negative, if the quantity of the entity associated with the measurement must be deducted; when the entity is calculated "negatively", the associated measurement data in the grid are shown in red.

Voice of price list, in which the data of the measurement Price List item are shown (see § C.4.1).

Row of measurement, in whose fields the composition of the entity measurement lines in the calculation must be defined by inserting texts, numerical values, variables, and formulas (see § C.5).

At the bottom right of the Archive Measurement window there are:

• The yellow buttons for entering the variables (see § C.5) and mathematical operators for the definition of any formulas in the fields of the row of measurement section.

• The buttons for managing categories and WBS coding

• The Save button saves the selected measurement making it non-editable.

• The Exit button that closes the measurement by canceling all unsaved changes made in it.

The operating procedures for creating and editing a measurement in the Measurements Archive are shown in § C.4.1.

C.4.1 How to Create a Measurement in Archive Measurements

Access the Archive Measurements window (see § C.4) by pressing the button of the same name on the toolbar.

In the Archive Measurements window, you can create a measurement by specifying the data of its price list item:

• by dragging in the window (with a Drag & Drop operation), the item taken from your reference price list in the Office format;

or

• manually.

A) Creating a Measurement with a Voice by Price List of Microsoft Office

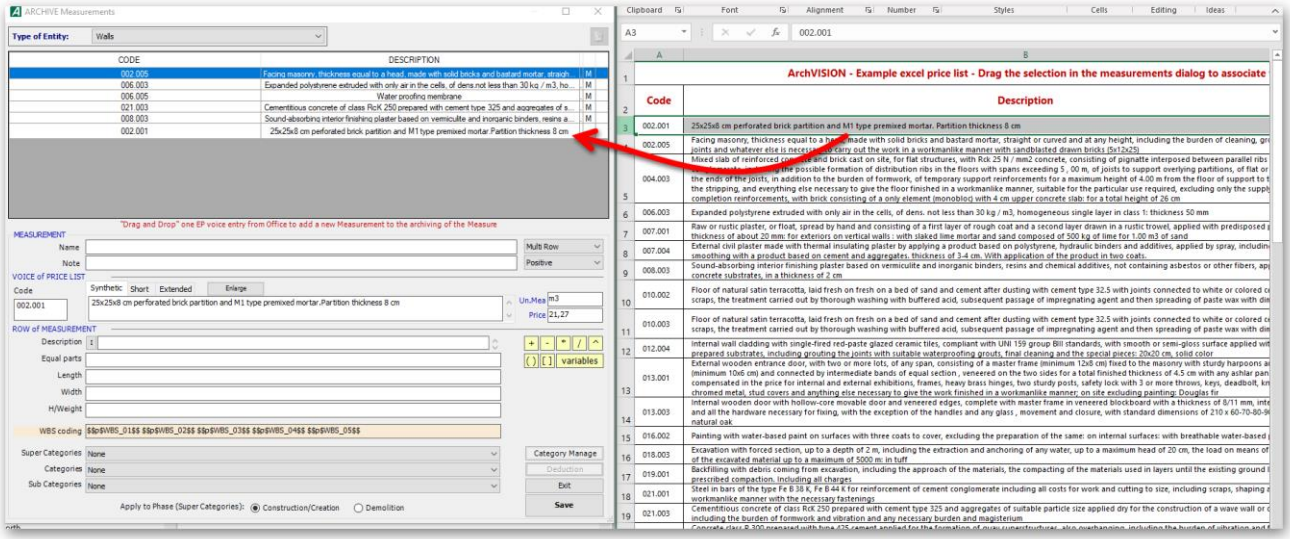
To create a new measurement that has, an entry of its reference list in the Excel / Word format like an entry in the Price List, just carry out the following operations:

1) In the Entity type list box, select the type of entity to which the measurement to be created refers.

2) Start Excel / Word by selecting the Start Excel / Word option from the menu that opens by pressing the Functionality button and, in this, open your reference list (see § C.4).

3) Drag, with a Drag & Drop operation, the Price List item of the price list onto the grid of the Archive Measurements window; this operation inserts the line of the new measurement in the grid and proposes

the fields for the specification of its data in the lower part of the window; in the new measurement, all the data of the dragged Price List item are already reported.



4) In the appropriate fields of the Measurements section enter the name of the measurement and any Notes.

Note!

The Name and / or the notes of the measurement may be reported in the description field of the measurement line of the calculation (see below).

5) In the list box to the right of the Name field, select the Multi-Row option if, in the calculation, a measurement line must be reported for each of the entities subsequently associated with the measurement; if all the entities associated with the measurement must be calculated in a single measurement line of the calculation, the Single Row option must be selected.

Attention!

The Single Row option must be used ONLY in combination with certain variables (see § C.6).

6) In the list box to the right of the Notes field indicate if the entities that will be associated with the measurement must be calculated positively or negatively (in deduction).

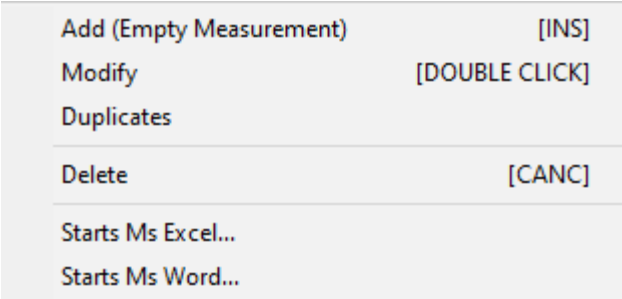
7) In the fields of the Row of Measurements section, define variable numerical values and formulas by inserting texts and, the composition of the measurement lines of the entities that will be associated with the measurement in the calculation (see § C.5).

8) Press the Save button to save the measurement.

A saved measurement is also made not editable.

To be able to modify a measurement it is necessary to make the fields of its data editable again by simply double-clicking on the item in the grid.

The measurement selected in the grid can also be made editable by selecting the Edit option in the Function button menu.



To Delete or Duplicate the measurement selected in the grid just select the Delete [DEL] or Duplicate options from the Function button menu.

B) Creating a Measurement by Manually Specifying the Voice Data of Price List

To create a new measurement in the Archive Measurements window whose Price List entry must be specified manually, just do the following:

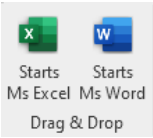
Press the Functionality button and, in the menu that opens, select the Add (empty measurement) option; this creates the new measurement staff in the window grid.

• In the Voice of Price List section, specify all the data of the P.L. measurement.

• Carry out the operations referred to in points 4), 5), 6), 7) and 8) of case A) previously illustrated.

C.4.2 How to Associate a Measurement with an Instance

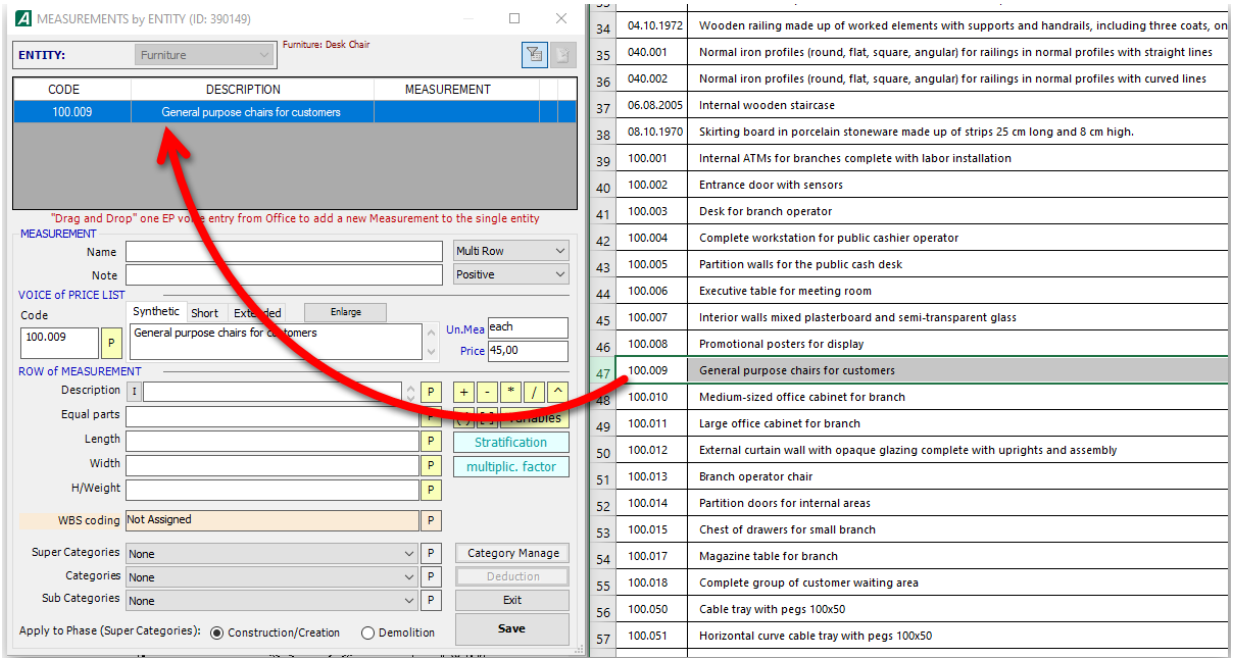
To create and associate a measurement to a drawn entity (e.g. a Wall) at the same time, the following operations must be performed:



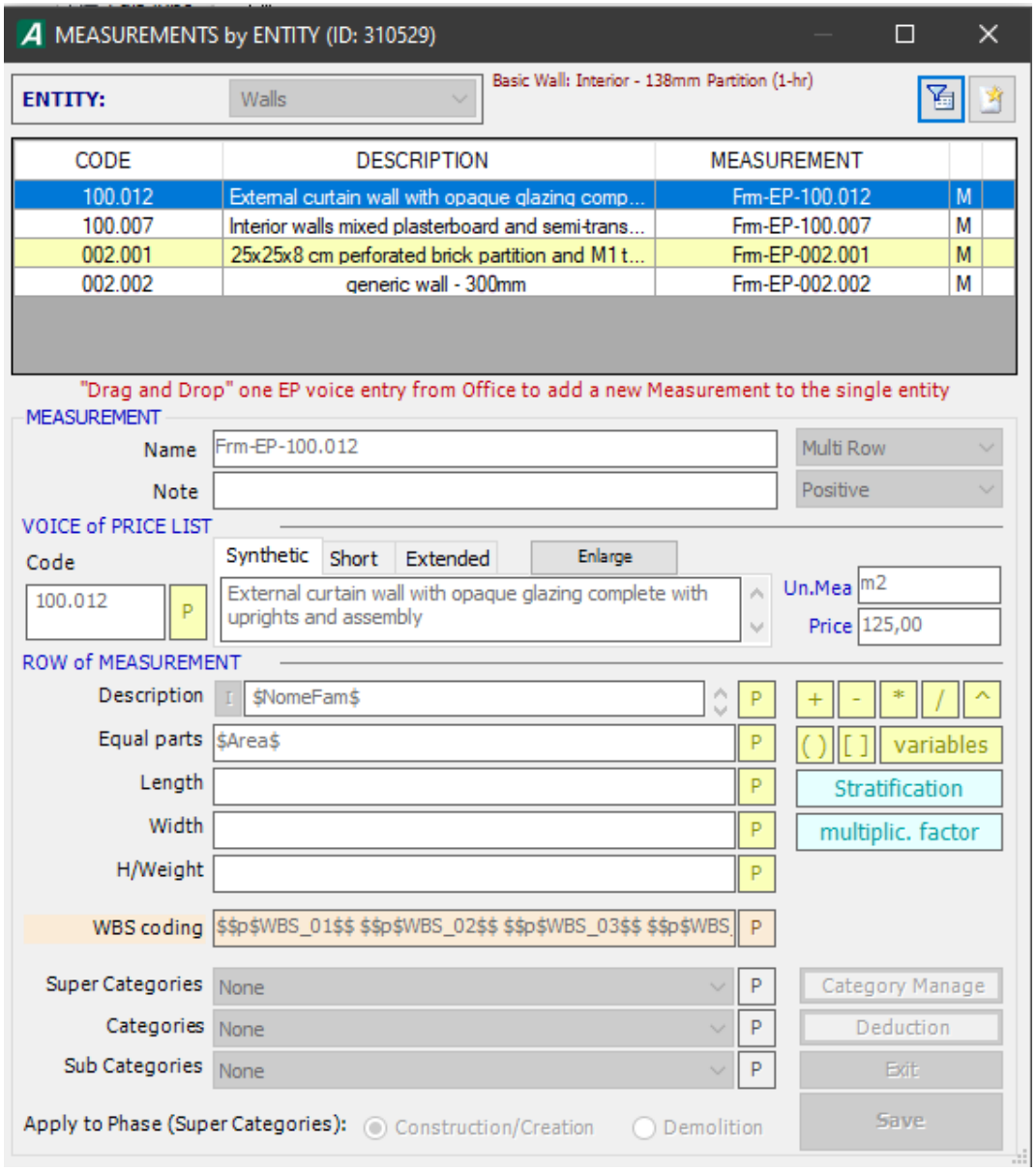
Start Excel / Word by pressing the Start Excel / Word button of the OFFICE 4 REVIT 21.0 Toolbar (see § C.3) and open your reference price list (see § C.8).

• Select the instance you want to associate the measurement with Press the Associate instance button of the Toolbar.

• Drag, with a Drag & Drop operation, the Price List item of the price list onto the grid of the Measurements by Entity window; this operation inserts, in the grid, the line of the new measurement and proposes in the lower part of the window, the fields for the specification of its data; obviously in the new measurement all the data of the dragged Price List item are already reported.



34	04.10.1972	Wooden railing made up of worked elements with supports and handrails, including three coats, on
35	040.001	Normal iron profiles (round, flat, square, angular) for railings in normal profiles with straight lines
36	040.002	Normal iron profiles (round, flat, square, angular) for railings in normal profiles with curved lines
37	06.08.2005	Internal wooden staircase
38	08.10.1970	Skirting board in porcelain stoneware made up of strips 25 cm long and 8 cm high.
39	100.001	Internal ATMs for branches complete with labor installation
40	100.002	Entrance door with sensors
41	100.003	Desk for branch operator
42	100.004	Complete workstation for public cashier operator
43	100.005	Partition walls for the public cash desk
44	100.006	Executive table for meeting room
45	100.007	Interior walls mixed plasterboard and semi-transparent glass
46	100.008	Promotional posters for display
47	100.009	General purpose chairs for customers
48	100.010	Medium-sized office cabinet for branch
49	100.011	Large office cabinet for branch
50	100.012	External curtain wall with opaque glazing complete with uprights and assembly
51	100.013	Branch operator chair
52	100.014	Partition doors for internal areas
53	100.015	Chest of drawers for small branch
54	100.017	Magazine table for branch
55	100.018	Complete group of customer waiting area
56	100.050	Cable tray with pegs 100x50
57	100.051	Horizontal curve cable tray with pegs 100x50



Note!

The Measurements by Entity window is like the Archive Measurements window (see § C.4) and differs from this because only the measurements relating to the type of belonging of the Entity selected in the drawing are proposed.

If the Activate / Deactivate Filter button is pressed, in the grid of the Measurements by Entity window, the measurements associated with the selected entity are shown in yellow, the grid also displays all the measurements relating to the type of membership of the Entity selected in the drawing but not associated with it in white.

When the Activate / Deactivate Filter button is not pressed, only the Measurements associated with the entity are displayed

• In the Measurement section of the window, type the name of the measurement and any Note that it will be possible to include in the description of the relevant measurement in the calculation (see § C.5).

Note!

The Voice of Price List section shows the data of the Price List item dragged from the price list and selected in the grid of the Measurements window; the entry data can also be edited at this stage.

• Enter the data that will make up the entity measurement line in the calculation in the fields of the Row of Measurement section; in each field, it is possible to insert: any text in the description field or a numeric value and/or a variable relating to a characteristic of the graphic entity to which the measurement is being associated.

The methods for entering data in the fields of the Row of Measurement section are described in § C.5.

Example!

As an example, assume that the graphic entity to which the measurement is to be associated is a masonry. The following values can be entered in the fields of the Row of Measurement section to define the measurement line in which this masonry will be calculated:
Description: $NmMs$, this string is the variable relating to the Name of the Measurement and allows you to return the string specified in the Name field in the "Measurement" section in the Description field of the measurement line of the calculation;
Length: $Length$, this string is the variable relating to the length of the masonry; the length of the masonry detected in the drawing will automatically be shown in the Length field of the measuring line of the Office calculation;
Width: 0.30, the numerical value of the thickness of the masonry;
H / Weight: 2.80, the numerical value of the thickness of the masonry.
The operating procedures for entering variables in the fields of the Row of Measurement section are illustrated in detail in § C.5.

• Press the Save button at the bottom right of the window to associate the measurement entered with the entity.

Once saved, the measurement associated with the entity is not editable. The methods to modify a measurement associated with an entity are illustrated in § C.4.3.

It is also possible to associate a measurement already present in the grid of the Measurements by Entity window to the entity previously selected in the drawing.

Note!

Please note that, in the Measurements by Entity window, in addition to the measurements associated with the selected entity, all the measurements of the same type already assigned to other entities or already created in the Archive Measurements are also proposed.

To associate another measurement already present in the grid of the Measurements by Entity window to the selected entity.

Make sure that the Enable / Disable Filter button in the window is pressed to display the measurements (blank fields) of the same type already entered but not associated with the entity selected in the grid.

• In the grid, select the measurement to be associated with the selected entity.

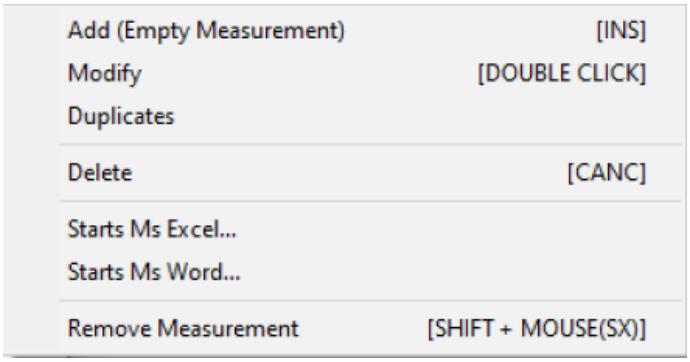
Press the Functionality button and select the Assign Measurement option in the menu that opens.

Note!

The last two operations can also be performed by right-clicking on the measurement to be associated and selecting the Assign Measurement option in the dedicated menu.

The features of the Measurements by Entity window for managing measurements and for their association with the entity selected in the drawing are present in the menu that opens by pressing the Functionality button, at the top right of the window itself.

The menu options of the Features button are:



Add (empty measure) [INS]: Insert a new staff (measure) in the grid; the measurement data, including those of Price List, must be specified in the sections below.

Edit [DOUBLE CLICK]: makes the data of the measurement selected in the grid editable.

Duplicate: Duplicates the selected measurement in the grid.

Delete [DEL]: Deletes the selected measurement in the grid.

Start Excel: starts the Excel program; this option is not enabled if Excel is already open.

Remove Measurement [SHIFT + Left Mouse Button]: removes the association between the entity selected in the drawing and the measurement selected in the grid. If the selected measurement is not associated with the selected entity, this option turns into the following option.

Assign Measurement [SHIFT + Left Mouse Button]: associates the measurement selected in the grid to the entity selected in the drawing. If the selected measurement is already associated with the selected entity, this option changes to the previous option.

C.4.3 How to Modify a Measurement Associated with an Instance

To change a measurement associated with an Instance of the drawing, just do the following:

• Select the entity whose associations with the calculation measurements you want to change.

Press the Associate instance button on the Toolbar.

• In the Measurements by Entity window, make the desired changes.

In the Measurements by Entity window you can:

• Associate new measurements to the selected entity in the manner illustrated in § C.4.2.

• Modify measurements already associated with the entity.

A previously saved measurement is also made not editable. To be able to modify a measurement it is necessary to make the fields of its data editable again by simply double-clicking on the item in the grid. The measurement selected in the grid can also be made editable by selecting the Edit option in the Function button menu.

• Remove the association of one or more measurements from the selected entity. To remove the link between a measurement and the selected entity, just do the following:

▪ In the grid, select the measurement line (fielded in yellow) that you want to disconnect from the entity selected in the drawing.

Press the Functionality button and select the Remove Measurement option on the menu.

C.4.4 How to Associate a Measurement with a Family

It is possible to associate Measurements to Families of objects in the same way as for the individual Entities.

With this operational methodology, it is possible to link Measurements directly to the Family of objects by ensuring that when the calculation is requested, the object itself is calculated according to the information and criteria specified in the Family to which it belongs. The advantage of this operating mode lies in the fact that you will no longer have to worry about associating the Measurement to each Entity but it will be directly ArchVISION OFFICE for REVIT which, when exporting the calculation, will use the Measurements by Family by computing each object. according to the formulas associated with the Family itself and using the dimensional values of the object belonging to the Family.

Important!

The measurements associated with the family will automatically be used for all objects or entities belonging to the family.
The use of the family is strongly recommended for the computation of objects of the same type.

Please note that the set of information necessary for the computation of an object or entity (price list item and composition of the row of measurement) is conventionally called "measurement".

The methods for inserting a measurement in a family are illustrated concerning the Revit Wall object.

To insert a measurement in a Wall Family you need to do the following:

• Select the wall whose family you want to link the measurement to; Press the Associate family button in the OFFICE 4 REVIT Toolbar. This operation opens the Measurements by Family window, similar to the Measurements by Entity window (see § C.4.2).

Important!

In the grid of the Measurements by Family window, only the measurements relating to the types of Wall present in the Archive Measurements (see § C.4) (associated or not associated with other wall families or simple Wall entities) are displayed.

Leave the Enable / Disable Filter button pressed to view all the measurements relating to the Masonry already present in the Measurements Archive in the window grid (see § C.4).

If in the grid there is the measurement of the masonry to be associated with the selected style, to proceed with the association just:

▪ in the grid select the measurement to be associated with the family; the selection of the measurement displays the related data (price list item and composition of the measurement line) in the remaining part of the window;

select the Assign measurement option in the menu that opens by pressing the Functionality button. The row of measurement assigned to the “centerline” of the wall style is filled in yellow in the grid;

▪ repeat the previous operations to associate any further measurements to the wall.

If, on the other hand, the measurement to be associated with the wall family is not present in the grid of the Measurements by family window, you must insert a new measurement to be assigned to the wall family by performing the following operations:

Start Excel by selecting the Start Excel option in the Features button menu and from here open your reference list (see § C.8).

• Drag, with a Drag & Drop operation, the appropriate Price List item (Masonry ...) into the grid of the Measurements by family window.

• In the Measurement section of the window, type the Name of the measurement and any Notes that can be reported in the description of the relevant measurement in the calculation (see § C.5).

Note!

The Voice of Price List section shows the data of the Price List item dragged from the price list and selected in the grid of the Measurements window; the entry data can also be edited at this stage.

• Enter the data that will make up the measurement line in the calculation in the fields of the Row of Measurement section; in each field, you can enter any text (in the description field), a numerical value, and/or a variable relating to a characteristic of the graphic entity to which the measurement is being associated.

It is also possible to insert formulas in which numerical values and variables are correlated by the usual mathematical operators (+, -, *, / and ^).

The methods for entering data in the fields of the Row of Measurement section are described in § C.5.

• Press the Save button at the bottom right of the window to associate the measurement entered with the wall family.

In the grid, the line of measurement associated with the family is filled in yellow.

A measurement associated with the family is not editable. The ways to modify a measurement associated with a family are illustrated in § C.4.5.

With methods similar to those illustrated above, it is possible to associate one or more measurements to a family of Entities.

C.4.5 How to Edit a Family Measurement

To edit a measurement previously associated with a family, e.g. a wall family, just carry out the following operations:

Press the Associate Family button in the OFFICE 4 REVIT 21.0 Toolbar.

This operation opens the Measurements by Family window with the list of measurements associated with the wall family. At this stage, the measurements associated with the family are not editable.

Note!

Notice that the staves of all the measures in the grid of the Measures by Family window are shaded in yellow. By default, only the measurements already associated with the selected family are proposed in this window.

When the Activate / Deactivate Filter button in the window is pressed, all the measurements associated with the selected family in the Measurements Archive are also displayed in the grid (see § C.4).

• Double click on the measurement to be modified to make the data editable in the lower part of the window; the measurement selected in the grid can also be made editable by choosing the Edit option from the Function menu button.

• Modify the measurement data appropriately (item in the Price List and / or composition of the row of measurement).

The methods for composing the measurement line are given in § C.5.

Obviously, in this phase, it is also possible to associate new measurements to the family (see § C.4.4) or to remove the association of one or more measurements.

To remove the association of measurement from the wall family, simply select the measurement in the grid and select the Remove Measurement option in the Function menu button. The same option is available in the local window grid menu.

Important!

The Remove Measurement function only removes the association of the measurement to the family but does not delete the measurement itself that remains available in the Measurements Archive.
To delete the measurement just select it and press DEL from the keyboard.

C.5 Row of Measurement Content

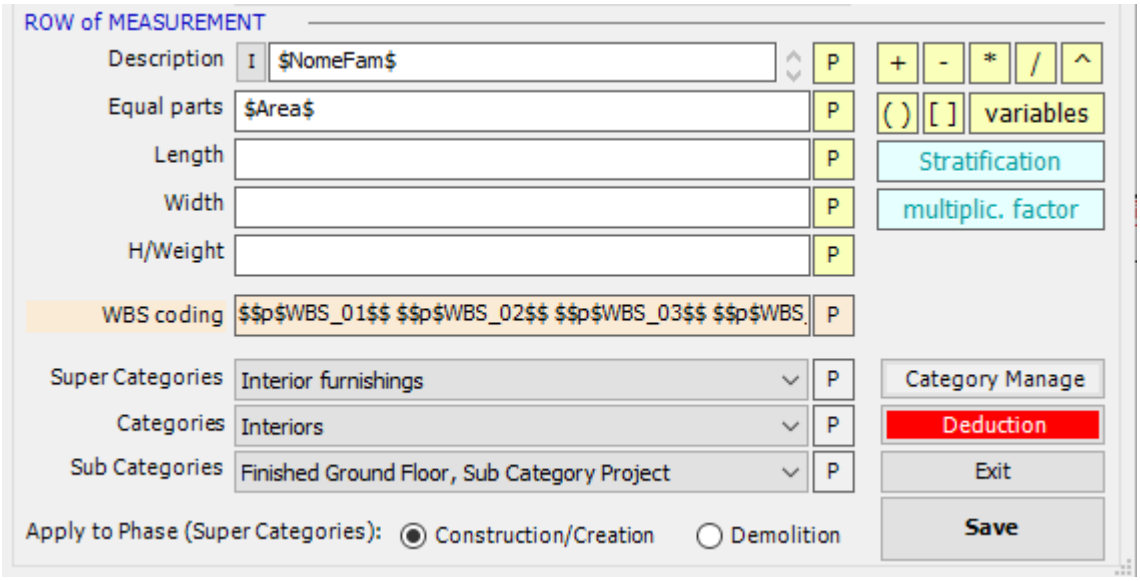
A Measurement consists of a group of significant information: a name and notes, a Voice of Price List, and a set of formulas that make up the Row of Measurements. The row of measurement follows the setting of the Excel / Word measurements.

The Row of Measurement section, in the lower part of the Archive Measure (see § C.4), Associate instance (see § C.4.2) and Associate family (see § C.4.4) windows, is dedicated to the composition of the staff selected measurement in the upper grid.

Therefore, the data, values, and variables that make up the measurement and that will be used by ArchVISION OFFICE for REVIT in the computation phase must be entered in the fields of this section.

Instead of specific data (eg a certain numeric value), it is possible to insert a “Variable” in each field of the Row of Measurement section.

A Variable is a string of the type $Lung$ that will be automatically replaced by the program during the calculation export phase (see § C.5.1) with the appropriate data or numerical value detected by the geometric and descriptive characteristics of the object/entity drawn.



The data substituted for the variables of the measurement line of an Object / Entity can be geometric data detected directly from the drawing or can be descriptions and / or values detected by the family or by the measurement associated with the entity or its family.

It is necessary to define the content of only the data fields necessary for the computation of the object/entity to define the row of measurement.

It is necessary to specify all the data of the Voice of Price List in the relevant section of the window to create a new measurement.

The data of a Price List item can be reported in the measurement with a simple Drag & Drop operation from an Excel/Word list (see §§ C.4.1, C.4.2, C.4.4) or they can be entered manually.

Important!

ArchVISION OFFICE for REVIT does not allow you to archive a measurement without a Row of Price List and there cannot be different Price List Items with the same Code.
In case of insertion of a Price List Item with a Code already stored, a check is made on the other characteristics of the Item (Description, Unit of Measurement and Price) and, in case of discrepancy, it is asked if you want to keep the Item already previously-stored or if you want to overwrite it with the new one you just entered.

A measurement can be filed when at least the data of the Voice of Price List have been entered (even if they are useless for the calculation as an empty line will be calculated if no values or formulas are entered in the measurement line). The EP entry data are:

Code: an alphanumeric string that uniquely identifies the item;

Description: text string for the description of the measurement, corresponds to the Price List Short Description;

Price: a numerical value that defines the unit price of the Item;

Unit of Measure: an alphanumeric string that identifies the unit of measurement with which the computed quantities of the Item are expressed.

Attention!

ArchVISION OFFICE for REVIT computes all the dimensions of the graphic entities by automatically converting them into meters.
In the summary or the export (see § C.7), depending on the unit of measurement set in the drawing and regardless of the unit of measurement of the EP Voice, the program automatically carries out the appropriate conversions to express linear measurements in m, surfaces in m2 and volumes in m3.

After entering the Voice of Price List data, the measurement can be archived by pressing the Save button. In this case, the measurement is empty as only the data of the Voice of Price List have been entered.

Saving the measurement ArchVISION OFFICE for REVIT also checks if it has been assigned a Name. If the program does not find the Measurement Name (the NAME field is empty) it automatically generates a name like:

Frm-EP-01.0145C, where:

• the first part “Frm-EP-” indicates that a formula (without a name) associated with the Voice of Price List has been created;

• the second part is the tariff code (01.0145C) of the item.

The name of the measurement can always be changed at any time by making the measurement editable again with a double click on the relevant staff in the window grid.

Let's see now how to define the Measurement Line to compute correctly an entity/family.

In the Row of Measurement section of the Archive Measurements windows (see § C.4), Associate instance (see §

C.4.2) and Associate family (see § C.4.4) the following five fields are available in which the criteria and formulas of the actual calculation are to be set:

Description: it is the field in which it is possible to compose the text string that will constitute the description of each measurement line. In the Description field, you can enter a text and/or certain descriptive variables (eg, variables related to the name and ID of the measurement). The content of this field will be shown in the export as a description of the measurement lines of the measurement associated with the entity/style.

Parts Equal: it is the field in which it is possible to insert numerical values, variables, and/or a formula to define the content of the field

“Equal parts” of the measurement lines are exported in the calculation of Excel / Word.

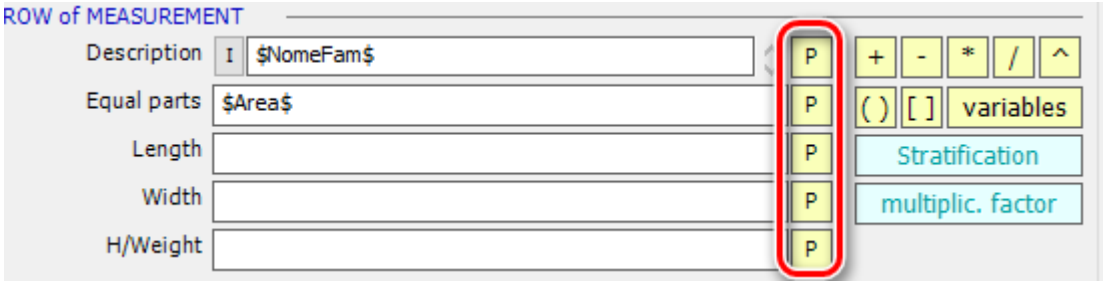
Length: this is the field in which numeric values can be entered, variables, and/or a formula to define the content of the field "Length" of the measuring lines exported in the calculation of Excel / Word.

Width: this is the field in which numeric values can be entered, variables, and/or a formula to define the content of the "width" field of the measurement staves exported in the calculation of Excel / Word.

H / Weight: this is the field in which it is possible to insert numerical values, variables, and/or a formula to define the content of the "height/weight" field of the measurement lines exported to the Excel / Word calculation.

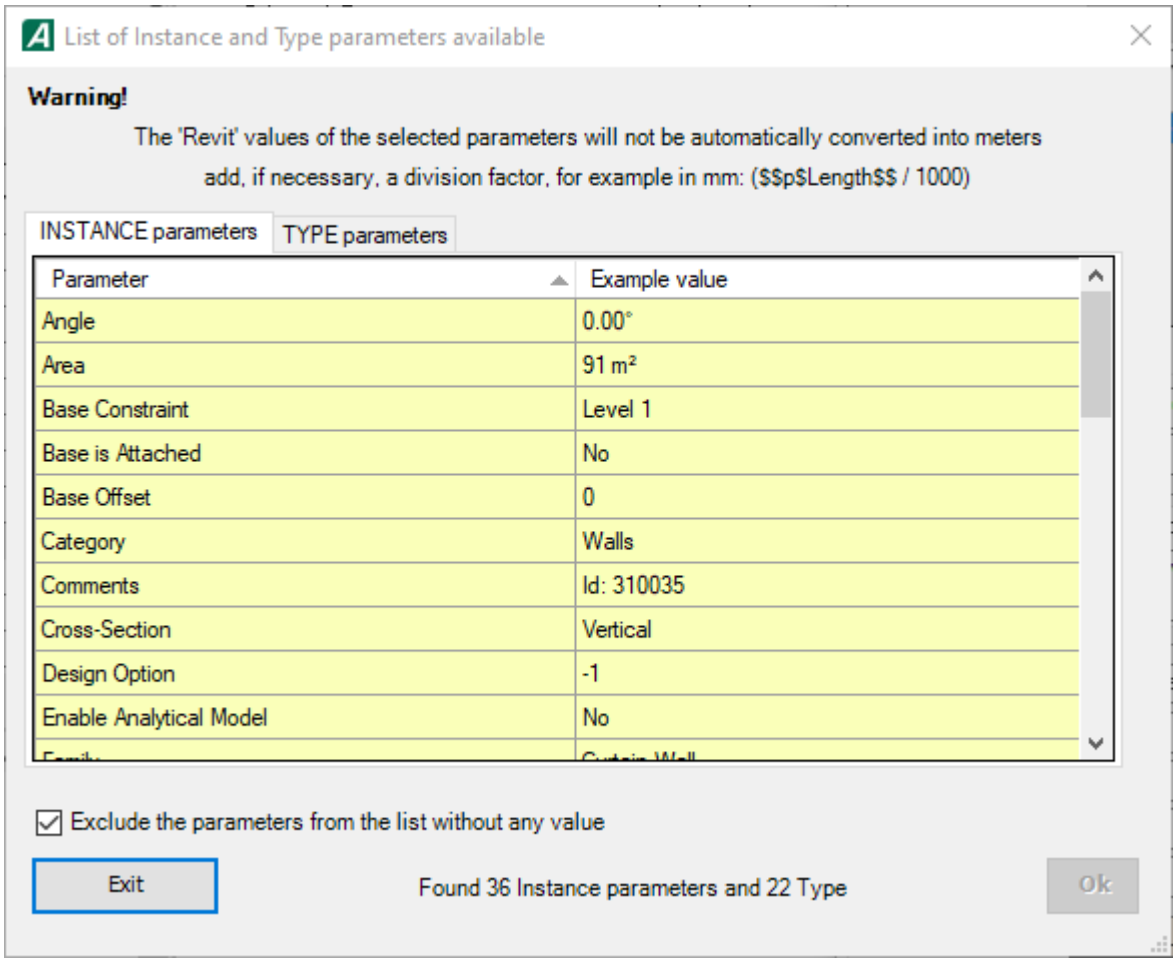
It is possible to freely type a text in the description field and the remaining fields it is possible to type any number.

The values needed to fill in these fields can be acquired directly from the Revit parameters. Click on the P button to the right of the field to tap into the Revit parameters.



After clicking, a menu opens and allows you to choose whether to use an instance or type parameter thanks to the two tabs at the top.

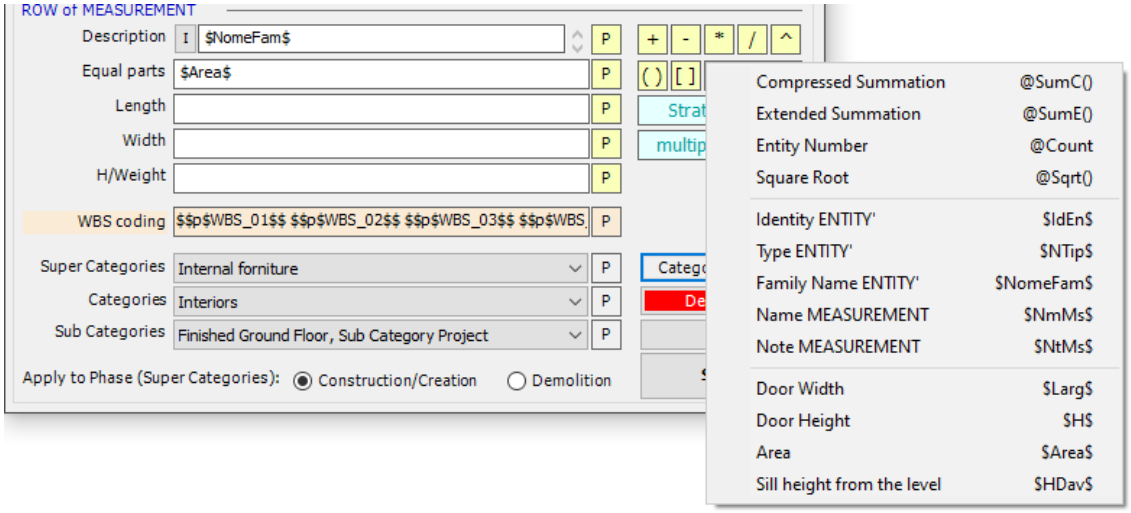
By default, the option to exclude non-compiled parameters is enabled.



On the other hand, a variable can be inserted into a field by making the following operations:

• Place the cursor in the field.

• Press the yellow Variables button to the right of the field. This operation opens a menu with the list of available variables for the entity/object in question.



• Select the variable you want to insert in the field. This operation inserts a string of the type $ Lung $ into the field.

Example!

Suppose you want to obtain, for the entity/object in question, the following data in the measurement lines of the calculation:
▪ the name of the measurement and the ID (identification code) of the object/entity drawn in the Description field (of the calculation);
▪ the length of the entity/object drawn in the Length field of the calculation.
To obtain the data described for the entity/object in the measurement lines of the calculation, just perform the following operations:
▪ position the cursor in the Description field of the Row of Measurement section;
▪ Click on the Variables button and, in the menu that opens, select the Measurement Name variable; this operation inserts, in the field, the variable $NmMs$ relating to the name of the measurement;
▪ after the inserted variable ($NmMs$) type "-" (space hyphen space) as separator and leave the cursor after the typed string (optional operation);
▪ Click again on the Variables button and select the Identity Entity variable from the menu; this operation enters, in the field, the variable $IdEn$ relating to the ID of the entity/object drawn;
▪ place the cursor in the Length field;
▪ Click on the Variables button and select the Length variable in the menu; this operation inserts the $Lung$ variable relating to the length of the entity/object drawn in the field.

In fields Equal parts, Length, Width, and Height / Weight it is also possible to insert mathematical formulas.

The parameters of these formulas can be variables and / or simple numerical values correlated to each other by the classic mathematical operators +, -, *, / and ^ (exponentiation), which can be entered by typing or by pressing the appropriate buttons yellow to the right of the fields.

It is also possible to insert parentheses in formulas. Such operators allow, as in any formula, to establish the "precedence" in the calculation of the part of the formula enclosed between them.

However, it is necessary to specify that the round brackets “()” have a different function from that of the square brackets “[]”.

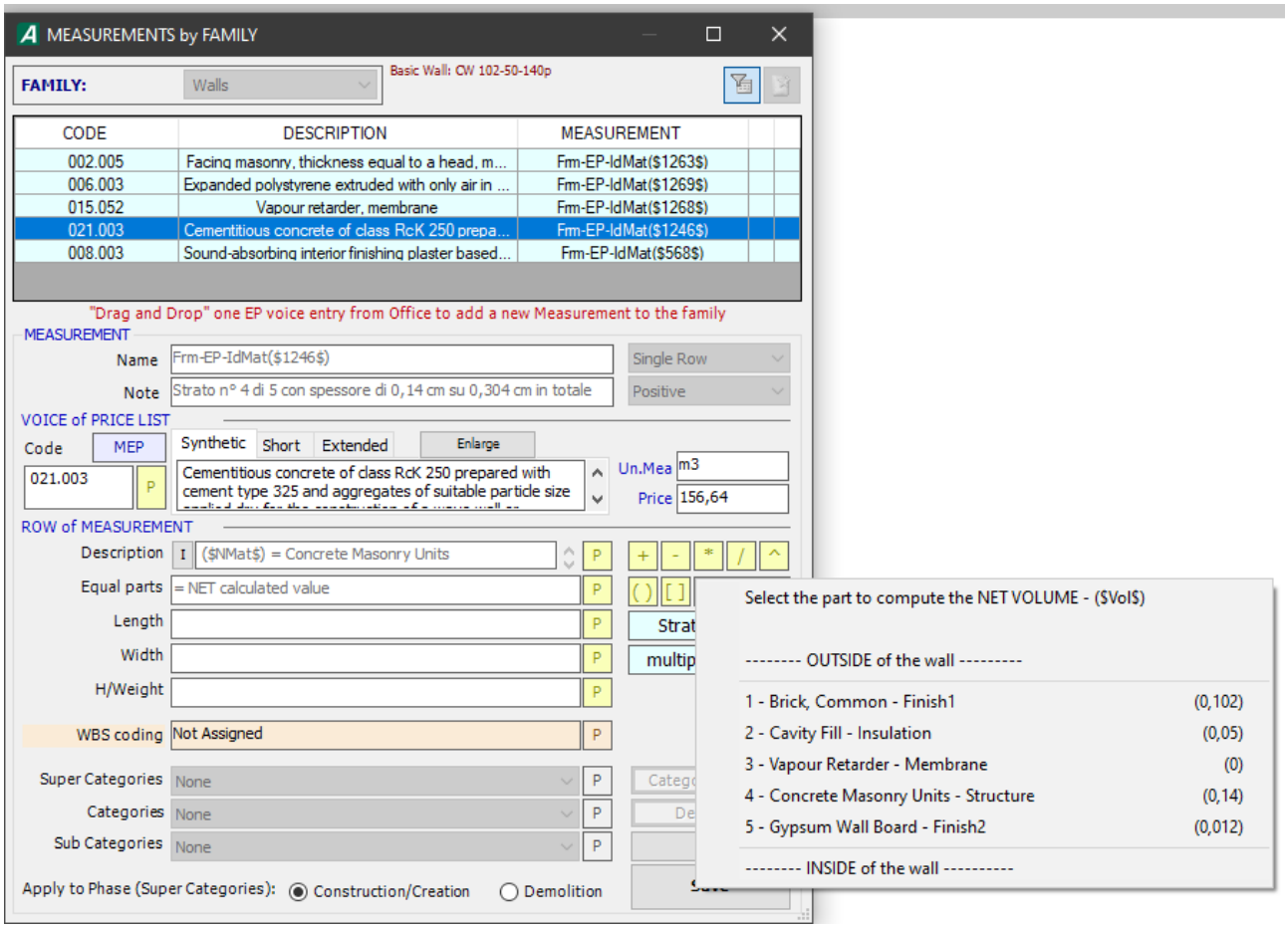
Example!

Below are some examples of formulas in which both square and round brackets are used with the relative export result in the calculation:
*3+ (4 * 3-5 * (2 + 4)) - 3 will be exported as: 3+ (4 * 3-5 * (2 + 4)) - 3*
*3+ (4 * 3-5 * [2 + 4]) - 3 will be exported as: 3+ (4 * 3-5 * 6) -3*
*3+ [4 * 3-5 * (2 + 4)] - 3 will be exported as: 3-18-3*
*[3+ (4 * 3-5 * (2 + 4)) - 3] will be exported as: -18*

Attention!

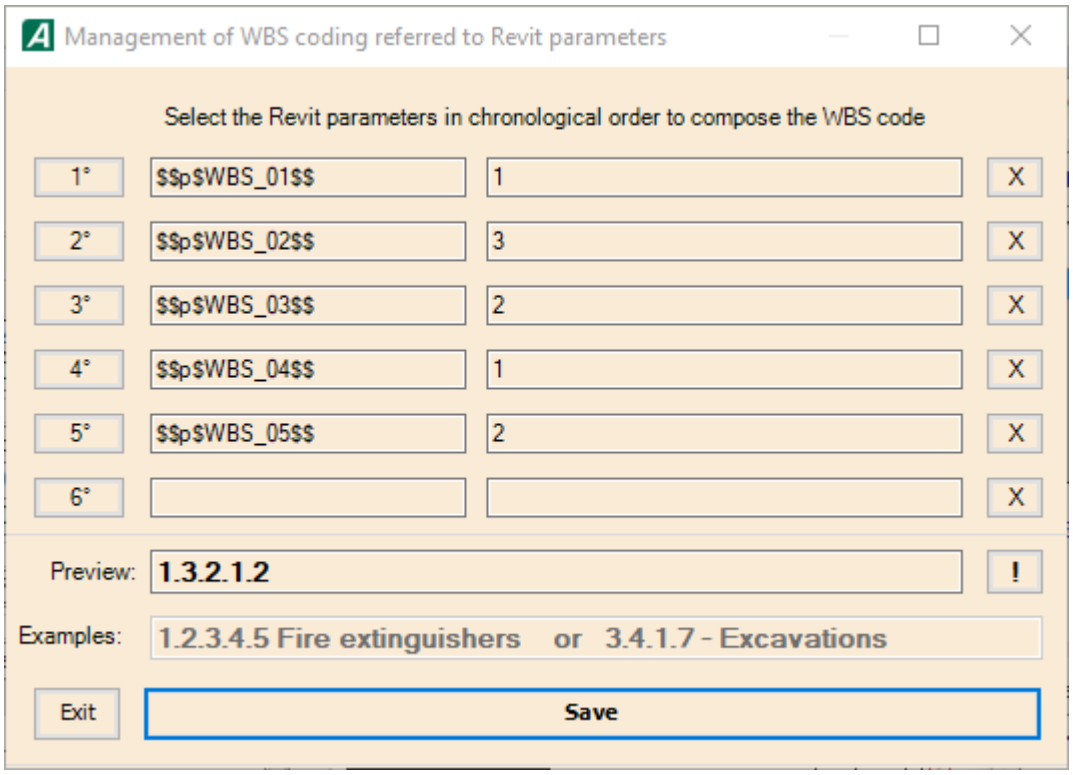
If a type of masonry is associated with a wall family (see § C.4.4) (for example the bricks that compose it) which must be calculated in m3, it would be incorrect to assume the thickness specified in the family as the wall thickness.
This thickness also includes, for example, the thickness of the internal plaster, the insulation layer, and the external plaster.
In this case, it is necessary to specify, in the Width field of the measurement associated with the wall, the actual thickness of the masonry adopted.
In the example shown in the Width field, just enter the formula:
Sp - (2 + 4 + 3)
where Sp is the variable relating to the overall thickness of the wall and 2, 4, and 3 are, respectively, the thickness (in cm) of the internal plaster, of the insulation, and, the external plaster.

Alternatively, it is possible to carry out the measurement by materials simply by clicking on the stratification button and select which layer to apply the measurement to. In this way, the software will calculate the exact thickness of the layer and apply the measurement to it. This measurement will then be associated with the material.

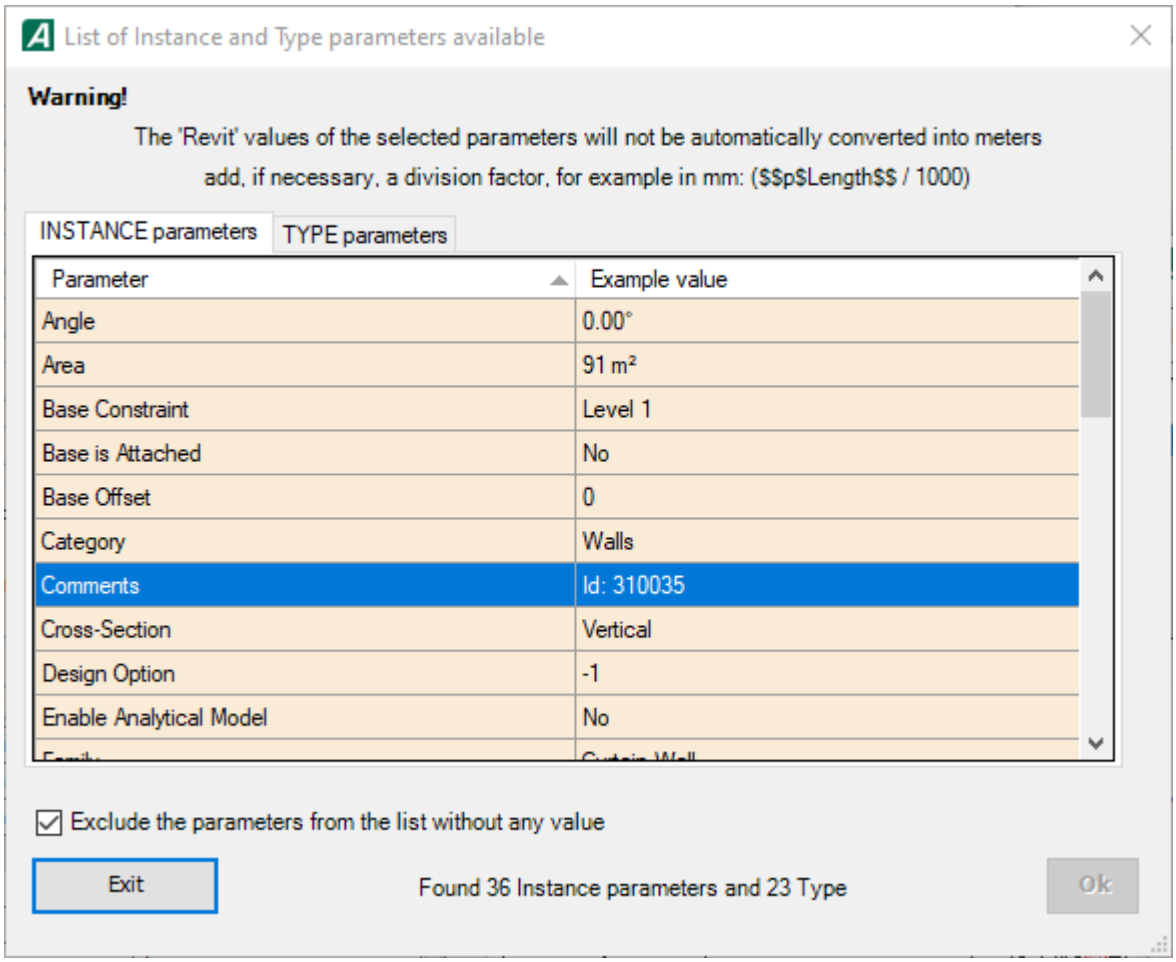


The row of measurements can be filled in with additional information regarding WBS coding, categories, and phases.

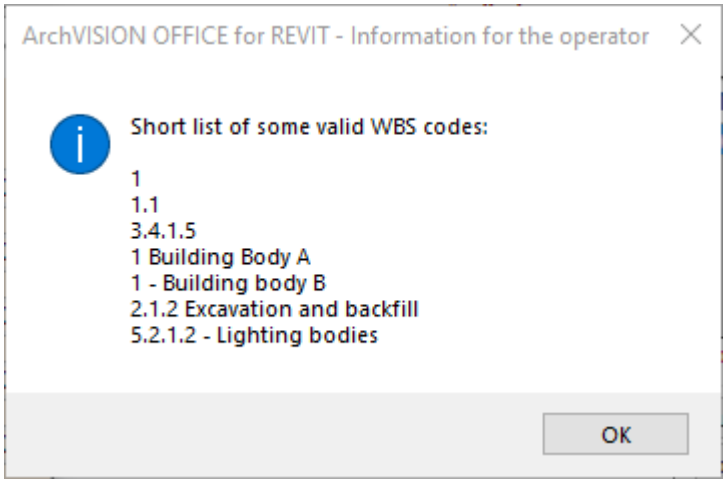
To associate a WBS encoding with the measurement, the user must have created specific parameters to express the encoding. Once these parameters have been associated with the element, by pressing the P key it is possible to associate them with the measurement. Pressing the P key gives a specific menu that allows you to choose the parameters to be used for WBS encoding. ArchVISION OFFICE for REVIT allows you to create an encoding that uses up to 10 parameters to generate the code.



It is possible to access the choice of the desired parameter by clicking on the number to the left of the fields, this number indicates the level of WBS to which the chosen parameter refers. By clicking on this button, you access the parameter selection menu already seen above.

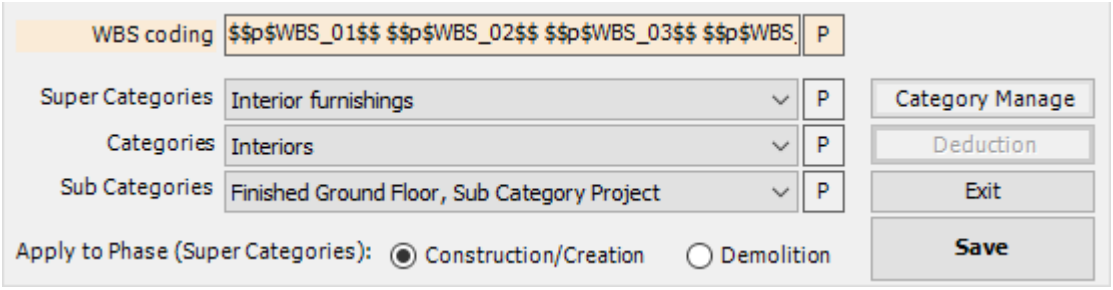


Remember that not all parameters can be used to compile the WBS code, in particular, it is possible to know what types of parameters to use by clicking on the "!" located to the right of the "Preview" field.

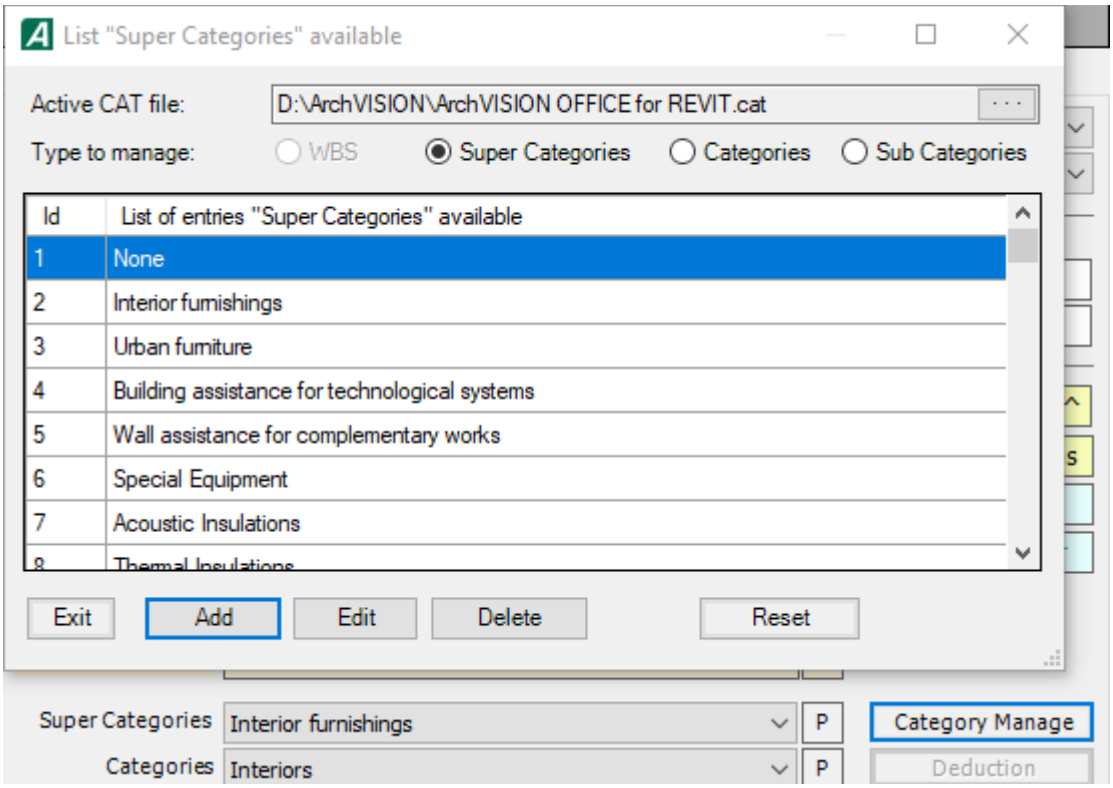


A useful tool to better manage the project and its quantity take-off are the **management by categories**. Management by category allows you to differentiate the different parts of a project according to criteria chosen by the user. For example, the categories allow you to differentiate and isolate the elements of furniture, or to manage a building for its functions.

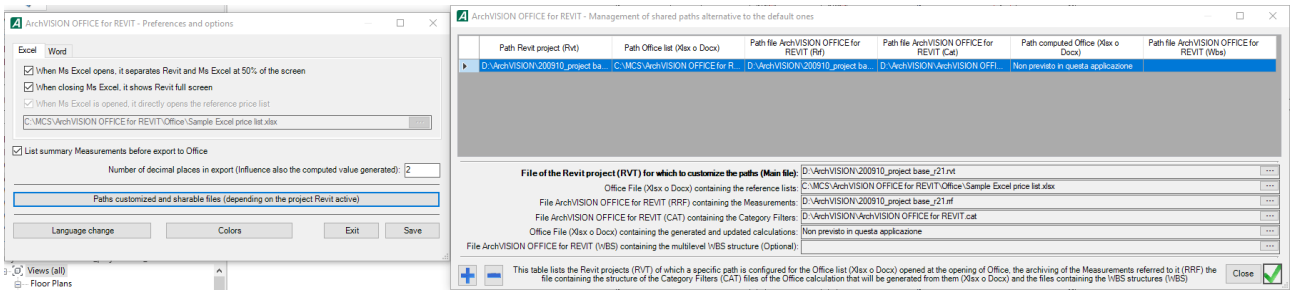
Three levels of categories can be set, the associable categories can be selected from a list already supplied with the software, from a list created by the user, or through the use of Revit parameters by pressing the "P" key to the right of the field.



Through the "Category Manage" button it is possible to add, modify, and delete the single items in the list of categories in use. The user can find out which category list file is in use in the project simply by checking the path shown at the top of the dialog.



From this window it is not possible to modify the category list file in use, to do this the user must go to the "Options, Language and Preferences" menu and from here access the "Paths customized and sharable files (depending on the project Revit active) ". From this menu, the user can choose whether to associate a different category list file.



Finally, it is possible to define which phase the measurement must be associated with, in particular, whether it is a measurement referring to the construction/creation phase or if it refers to demolition.

C.5.1 Variables

When editing a row of measurement formulas (see § C.5) it is possible to enter some variables that represent both descriptive and geometric characteristics of the entity/family in question.

By pressing the Variables button in the Archive measurements (see § C.4), Associate instance (see § C.4.2), and Associate family (see § C.4.4) windows, the menu containing all the variables available for the entity or the family being edited is displayed.

A variable is a text string characterized by the presence of a leading and trailing "$" character. The variables in the menu are grouped by type. The first two groups of variables are common to all entities or styles.

The first group of variables, identified by the presence of the @ character, includes mathematical functions that will be illustrated in § C.5.2.

The second group contains the descriptive variables (name, type, family, and descriptions of the instance/object).

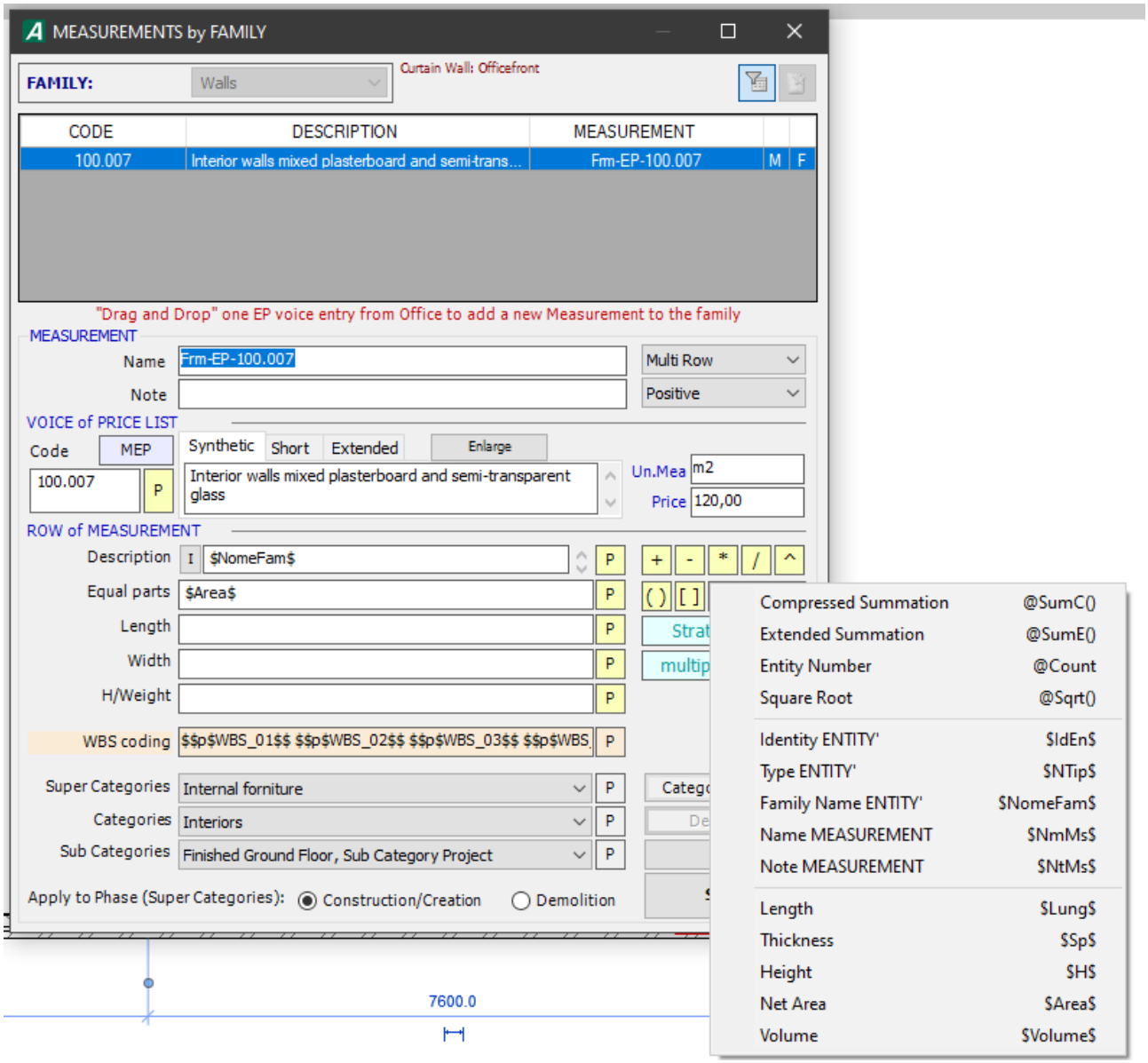
All the other variables available in the menu are proposed concerning the type of object for which the measurement is defined.

Generally, the last group of the menu offers variables related to the size of the object/instance.

Important!

The values to replace the variables relating to the dimensions of an object/instance are not always detectable by the drawing.
Often in the project, a simple instance represents a physical object that has more dimensions than those represented graphically. For example, a simple Project Line can represent a trench or a pipe.
It is therefore extremely useful to have additional variables available, not directly related to the graphic representation of the CAD entity, but related to the object family, which allows the user to obtain the complete computation of the real object schematically represented in the drawing.

Name of Variable	Description	Wall	Window	Door	Floor	Roof	Stairs	Railing	Ramp		Columns	Furnishing	Greenery	Structural Column	Floor: slab edge	Room	Structural foundation	Structural frame	Structural beam system	Other
@SumC	Sum Compressed (total only)	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
@SumE	Extended sum (formula)	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
@Count	Count Values - Number of instances	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
@Sqrt	Square root	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
$IdEn$	Entity ID	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
$Ntip$	Entity type	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
$NomeFam$	Family name	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
$NmMs$	Measurement name	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
$NtMs$	Measurement note	x	x	x	x	x	x	x	x		x	x	x	x	x	x	x	x	x	x
$Lung$	Lenght	x						x			x			x	x		x	x		
$Larg$	Depth		x	x			x		x		x			x			x			
H	Height	x	x	x		x	x						x	x		x				
Sp	Thickness	x			x	x											x		x	
$Area$	Area	x			x	x					x			x	x	x	x	x		
Prm	Perimeter				x											x	x			
$SogLungE$	Tread depth						x													
$SogLargE$	External sill protrusion		x																	
$SogSpesE$	Riser Height						x													
$HDav$	Sill Height / Threshold / Num. of risers		x	x			x													
Vol	Room volume															x	x	x		
$NProg$	Progressive number of the room															x			x	
$SpFi$	Fixed Spacing																		x	
$SpMa$	Maximum Spacing																		x	
$SpSg$	Clearance Spacing																		x	



The following table lists the variables used by each entity. The "Dim. Each" and "Dim. Fam" columns indicate whether the variable acquires the value from its dimension from the object instance or the value set in the family. Besides, there is a description of how the value of each variable is calculated

Instance	Name of variable	Dim. Each	Dim. Fam	Description
Wall	$Lung$	x		Wall Length
	Sp		x	Wall Thickness
	H		x	Wall Height
	$Area$	x		Net Wall Area (subtracting gaps and intersections with other walls)
Window	$Larg$		x	Window width
	H		x	Window height
	$SogLargE$		x	Protrusion of the external sill
	$HDav$	x		Sill height from floor level
Door	$Larg$		x	Door width
	H		x	Door height
	$HDav$	x		Threshold height from floor level
Floor	Prm			Perimeter
	$Area$			Floor area
	Sp			Floor thickness
Roof	Sp		x	Roof slab thickness
	H	x		Maximum ridge height
	$Area$	x		Area
Stairs	$Larg$	x		Stair width
	H	x		Total stairs height
	$SogSpesE$		x	Riser height
	$SogLungE$		x	Tread depth
	$HDav$	x		Number of rises
Railing	$Lung$	x		Railing length
Ramp	$Larg$		x	Ramp width
Column	$Lung$		x	Column length
	$Larg$		x	Column width
	$Area$		x	Section area of the column
Greenery	H		x	Tree height
Structural column	$Lung$		x	Column length
	$Larg$		x	Column width
	H	x		Column height
	$Area$		x	Section area of the column
Floor: slab edge	$Lung$	x		Edge length
	$Area$		x	Section area of the edge
Room	$NProg$	x		Room progressive number
	H	x		Room height
	Prm	x		Room perimeter
	$Area$	x		Room area
	Vol	x		Room volume
Structural foundation	$Lung$	x		Length (not counted for slab)
	$Larg$	x		Width (not counted for slab)

	Sp	x		Thickness
	Prm	x		Perimeter (not counted for isolated and wall foundation)
	$Area$	X		Area (not counted for wall foundation)
	Vol	X		Volume
Structural frame	$Lung$		x	Length
	$Area$		x	Section area
	Vol		x	Volume
Structural beam system	$NProg$	X		Number of rows (of beams)
	Sp	X		Centerline spacing (if set as a property - Pattern)
	$SpFi$	X		Fixed Spacing (if set as property - Pattern)
	$SpMa$	X		Maximum Spacing (if set as property - Pattern)
	$SpSg$	X		Clear spacing (if set as a property - Pattern)

C.5.2 @ Variables from Instances/Objects

By pressing the Variables button in the Archive Measurements (see § C.4), Associate instance (see § C.4.2), and Associate family (see § C.4.4) windows, the menu containing all the variables available for the instance or family being edited.

The variables of the first group of the menu are:

@Sqrt (): function for calculating the square root; the square root of the content (value or formula) enclosed in brackets will be calculated by inserting this variable in a field, for example:

@Sqrt (20 + 5) will be exported as: (20 + 5) ^ 0.5.

@Count: a function that counts the entities to which the measurement in question is linked; this function is particularly useful if used with object families; in this case, the number of entities belonging to the family present in the drawing will be calculated.

@SumC (): summarizes the contents of the brackets (numeric value, variable, or formula) for all the entities to which the measurement in question is linked and exports only the final value calculated in the quantity take-off.

@SumE (): summarizes the contents of the brackets (numeric value, variable, or formula) for all the entities to which the measurement in question is linked and exports a formula with all the values resulting from the evaluation made in the drawing in the quantity take-off.

Example

The following example better clarifies the above.
Suppose you have drawn four walls with lengths of 2 m, 3 m, 4 m, and 5 m respectively, and that you have associated with them a measurement containing, in the "Length" field, the formula @SumE ($Length$). When exporting quantity take-off ArchVISION OFFICE for REVIT will search for all instances to which the measurement is associated and will find the four walls.
For each wall, the expression ($Lung$) will be evaluated and the length will be identified.
The results of the evaluation carried out for each instance will then be added together in a single expression (2 + 3 + 4 + 5) which will be exported in the calculation.

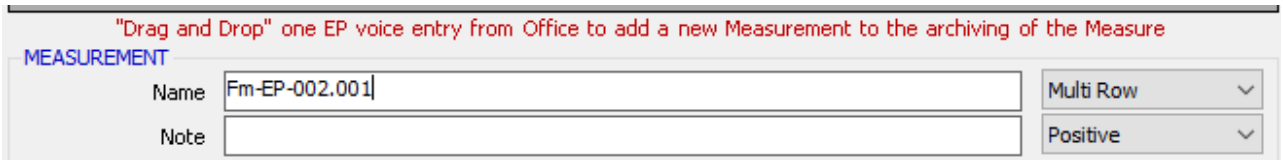
If instead of the @SumE function, the @SumC function had been used, the procedure would have been the same, but only the value 14 would have been exported, resulting from the evaluation of the expression (2 + 3 + 4 + 5).

C.6 Measurement methodologies

ArchVISION OFFICE for REVIT allows you to choose how to compute each measurement using two combo boxes located to the right of the measurement name.

In the first combo box, it is possible to choose whether to compute the measurement in multi-row or single-row mode.

In the second combo box, it is possible to indicate whether the measurement must be calculated positively or negatively.



A measurement is normally set with the calculation in multi-row - positive modes.

Positive and Negative

The meaning of the positive/negative setting is related to how you want the measurement to be evaluated. The following example will help clarify the concept.

Suppose you want to calculate the plaster surface of a wall: in this case, you will set a measurement linked to the wall family.

Suppose you want to use a wall named “Partition 20”.

You shall select a wall belonging to this family and then select the "Associate family" button.

In the Measurements by family window that opens, we will fill in the measurement by importing the Price List Item with the cost per m2 of the plaster to be used.

In the Row of Measurement section, insert the "$Lung$" variable in the length field and the "H" variable in the height field.

In the appropriate combo boxes, we choose to adopt the multi-row and positive measurement types.

In this way, the program will calculate the "gross surface" of the wall, which is the so-called "empty for full" also known as total volume management including dead freight.

To obtain the net surface of the wall (without the voids due to the presence of windows and doors), the surface of the windows and doors must be subtracted from the gross surface.

A measurement must be added to calculate the plaster surfaces to be deducted.

To do this we will use the window and door families.

Associate the families of doors and windows with a measurement with the same price list item as the plaster of the wall, taking care to specify that the relative measurements must be calculated in the negative.

Naturally, in the row of measurement of the negative measurement of the window/door family, we will have to insert the variable "$Width$" in the width field and the variable "H" in the height field.

These operations must be carried out only if the wall is not calculated by drawing from the area and volume values reported by Revit, these values are already calculated net of the deductions from the software, so adding further deductions would count them twice

Note

When a measurement is set with the "negative" calculation mode, it is represented in red in the grid of the list of measurements.

Multi-row singe-row

The meaning related to the Multi-row / Single Row setting lies in the way in which the measurement is calculated.

Multi-row measurements are more frequent and make ArchVISION OFFICE for REVIT export a row for each object/instance to which the measurement will be linked. This is the case where you want to compute each instance based on its size.

In the case of a single row, the program will export a single line for the measurement in question.

In this case, it is not guaranteed which row will be exported as the first line found is always exported based on the selection made.

The usefulness of this calculation method is closely linked to the use of summary variables.

We have seen in the previous paragraphs that ArchVISION OFFICE for REVIT provides some variables (summary functions) marked with the @ character, such as @Count and @Sum.

Using these formulas, it becomes almost mandatory to adopt the Single Row methodology.

The following example will clarify the above.

Suppose we have drawn the four walls of the example of § C.5.2.

Using the @SumE formula we have obtained a line with the formula of the sum (2 + 3 + 4 + 5) of the lengths of the walls in the quantity take-off.

With the Multi-row mode the described row of measurement would have been erroneously exported four times in the calculation: once for each instance (wall) drawn.

The formula inserted in the line of measurements would have been recalculated for each of the entities to which the measurement is associated.

However, by setting the Single Row mode for measurement, the program exports a single line with the summary equation of the lengths of the measurement lines.

Important

When using the @Count, @SumE, and @SumC functions it is necessary to check the setting of the measurement computation mode.
Generally, with these functions, it is necessary to use the Single Row mode.

Now let's see an example of measurement containing variables of the type @ in which it is useful to use the Multi-row computation mode.

Let's continue to focus on the previous example and suppose we want to calculate the incidence of the length of each wall drawn to the total length of the walls.

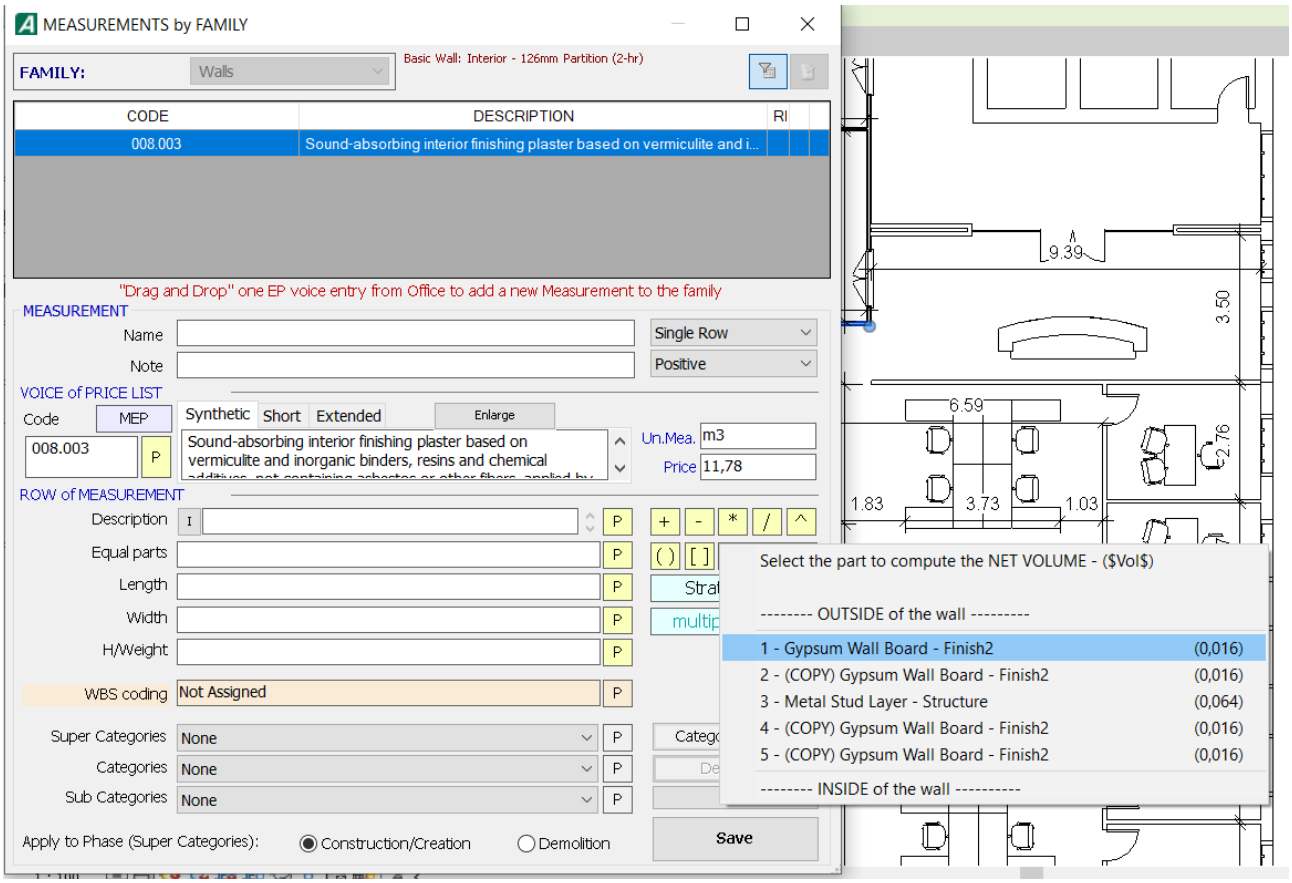
This methodology can be useful for calculating the incidence of the cost of a section or a detail on the total cost of an intervention.

To perform this calculation, enter the formula in the appropriate field of the measurement line: $Lung$ / @ SumC ($Lung$) and choose the Multi-row option in the appropriate combo box.

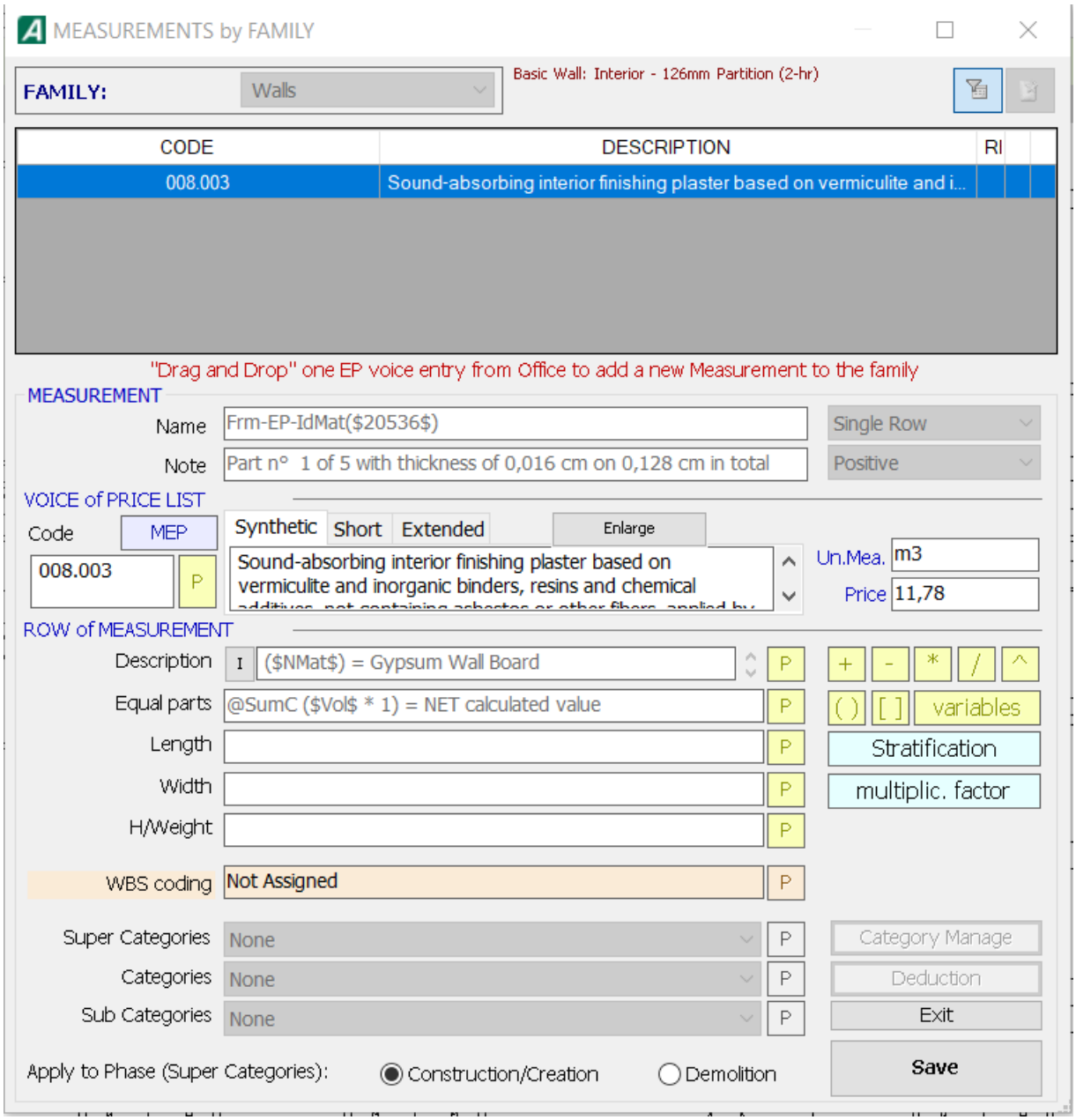
ArchVISION OFFICE for REVIT will export in the calculation as many rows as there are entities to which the described measurement is associated and staff will be reported with the ratio between the length of the wall and the total length of the walls for each wall instance.

Measurements by materials

Measurement by materials is a mode that allows you to associate a code, with not to an element but a material. This mode is available for system families: walls, floors, roofs, and ceilings. To access this mode, simply click on the "Stratification" button in the Row of Measurement and select the layer made up of the material to which to associate the measurement.



Fields for calculating the size of the layer to be calculated are automatically filled with formulas when this mode is chosen. Leaving the fields not manually filled in is required to access this mode.



The measurement is associated with the material and not to the layer, this is automatically assigned to all the layers characterized by the material regardless of the family they belong to.

C.7 Quantity take-off export

Once the appropriate measurements have been assigned to the families of objects and the drawn Entities, it is possible to request the export of the quantity take-off in the preferred Excel / Word format.

In this phase, it is possible to request to export the quantity take-off of the project by selecting the instances of which you want to obtain the computation in the drawing.

Press the Export count icon in the same toolbar to request the count of a part of the project after selecting the instances you want to calculate.

The export to Office takes place automatically if, in the Properties, the activation of the summary window is disabled.

If the summary window opens during the procedure, you must press the Send calculation to Office button in the same window to proceed with the export of the calculation.

ArchVISION OFFICE for REVIT presents a dialog for selecting the desired export mode upon activation of the export to Office:

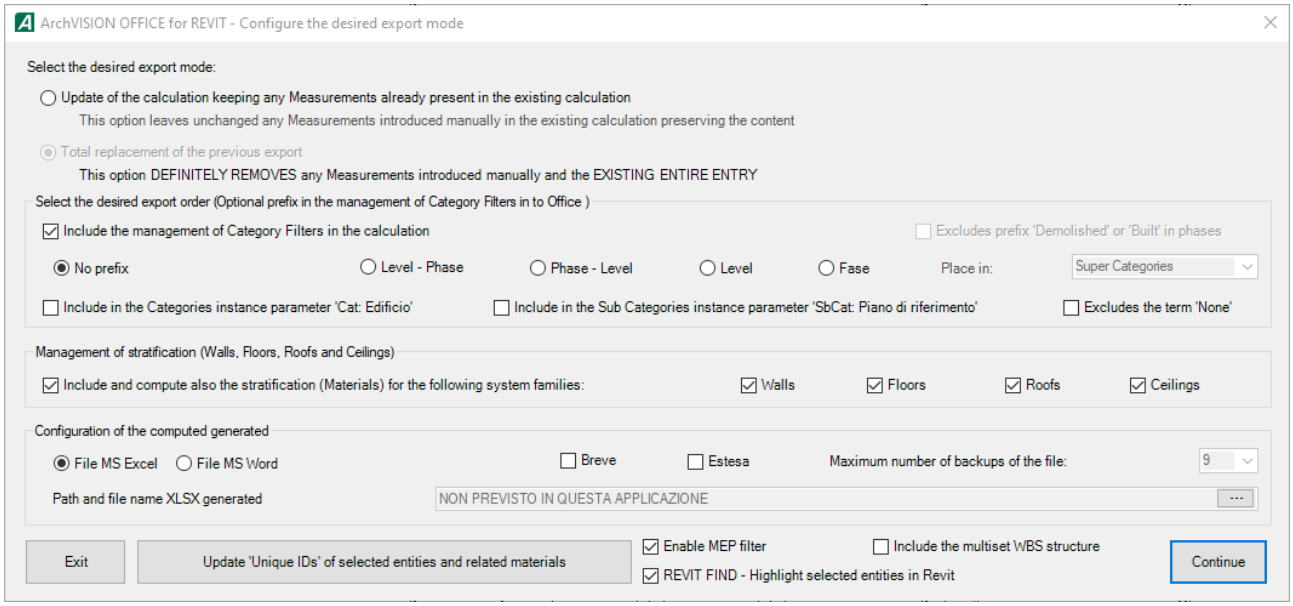
In the dialog you can choose one of the following options:

Calculation update keeping any measurements already present in the existing calculation: the measurements already present in the calculation are updated and any new measurements are added without deleting any measurement or price list item of the quantity take-off. Measurements not exported from ArchVISION OFFICE for REVIT and entered manually are kept.

Total replacement of the previous export: a new Microsoft Office accounting document is created. If the specified document already exists, it is deleted and rewritten.

Note

ArchVISION OFFICE for REVIT in the calculation export phase automatically generates a Super Category in Office for each exported plan (whose name is that of the plan in the Revit project).



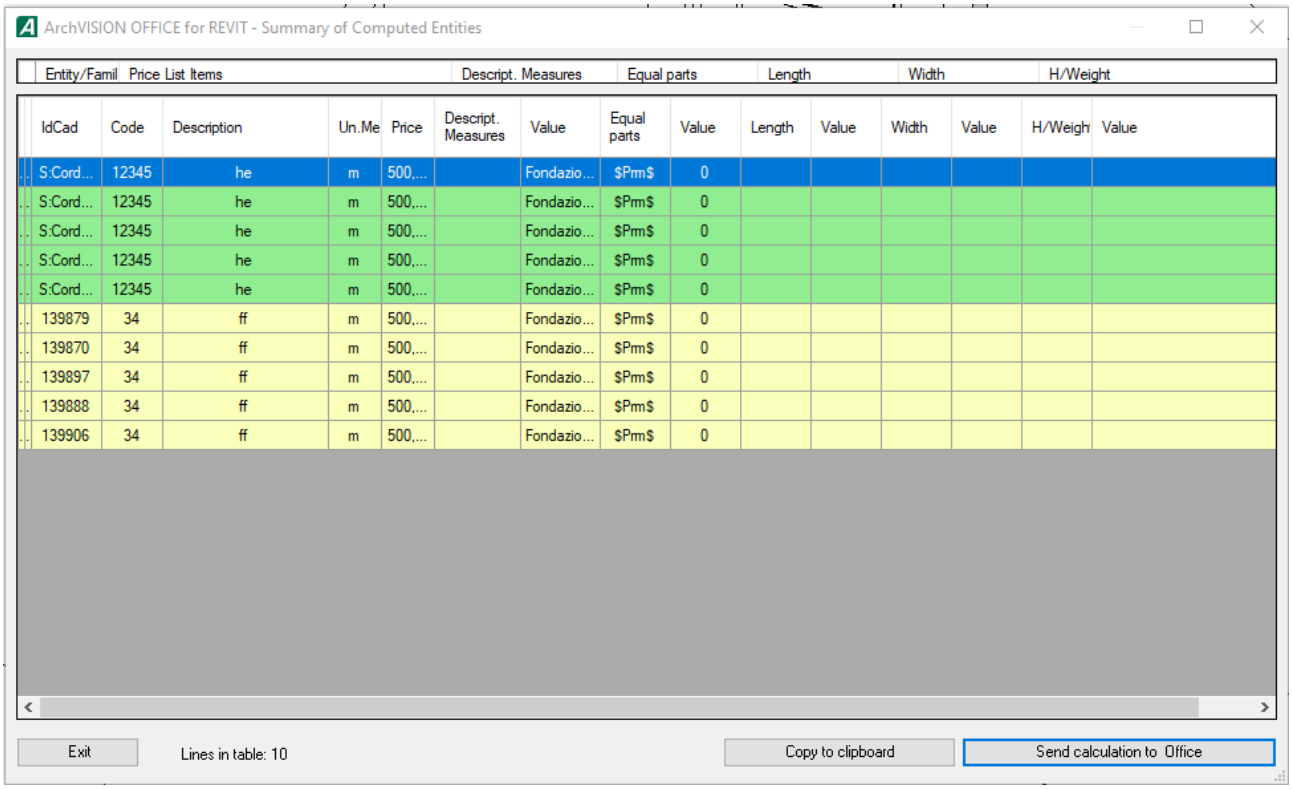
The desired export order can be selected within this dialog; in this way, the user can choose whether to include the management of category filters in the quantity take-off. A prefix indicating the level, or the phase, or both can be added. the stratification management for walls, floors, roofs, and ceilings can be selected by enabling the quantity take-off for materials for those elements that have been measured in this way. The configuration of the generated calculation allows you to choose the format of the quantity take-off, its position, and the number of backups. Finally, it is possible to decide whether to include the MEP elements, the WBS encoding, and whether to enable the **Revit Find** option, which allows you to select a row in the quantity take-off and automatically select the instance to which it refers within the Revit model.

Pressing the Continue button starts the export of the bill of materials in the chosen Office format; the export of the calculation takes place by creating a document in .xlsx or .docx format depending on the choice made by the user in the same folder as the Revit project with the name equal to the name of the

Revit project and with the chosen extension. Even if it is present in the Office system, and .xlsx or .docx file will be created exactly as it happens for Office.

In the preferences of ArchVISION OFFICE for REVIT, during the computation procedure, it is possible to request a window with a summary table of what has been computed, before proceeding to export to Excel / Word.

This table allows you to analyze the calculation before exporting it to Office.



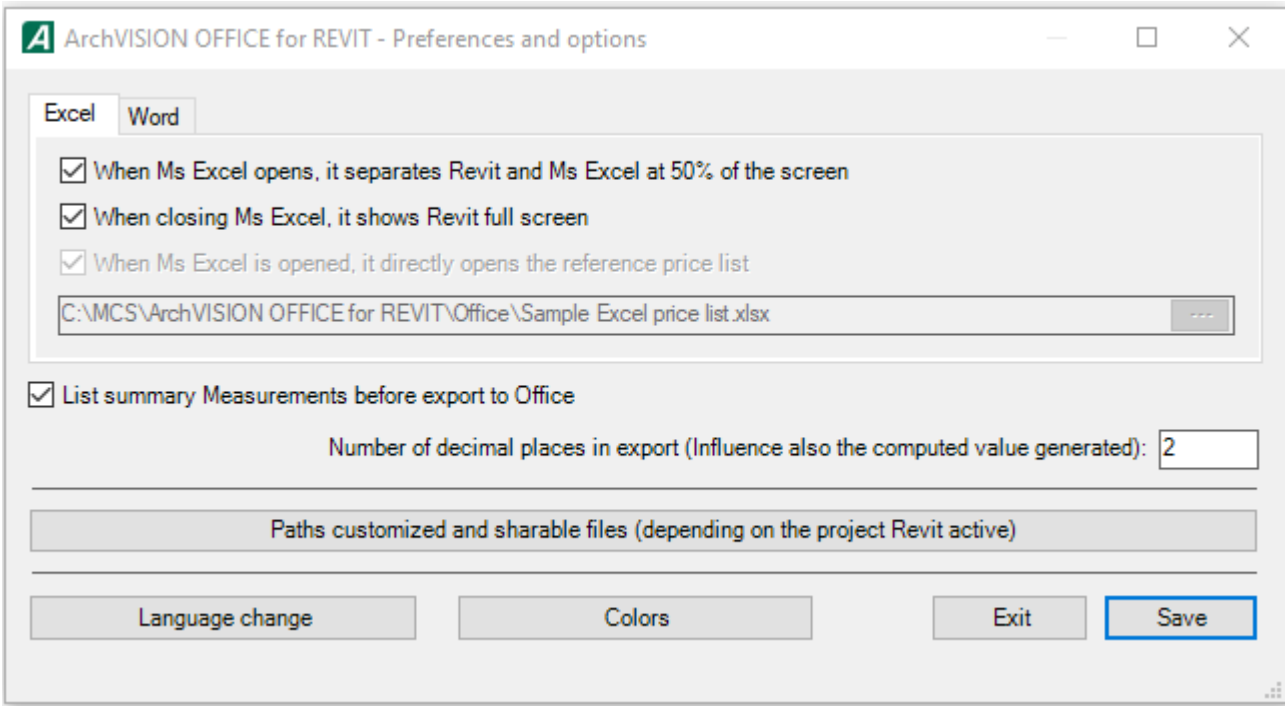
Important

The summary window works regardless of whether the Office is on the computer you are working on. This is useful when preparing a project which will then be computed with Office by transferring the file to another computer.
It is advisable to enable the summary window at least in the early stages of work to easily compare the formulas entered with the results produced.
The summary window is disabled by default upon software installation.

C.8 Quantity take-off preferences

ArchVISION OFFICE for REVIT allows you to customize its behavior during the execution of the functions related to the calculation.

These customizations are made in the Options, language, and preferences dialog which can be accessed from the OFFICE 4 REVIT toolbar by pressing the appropriate icon.



Among the options for defining the calculation settings, the following stand out:

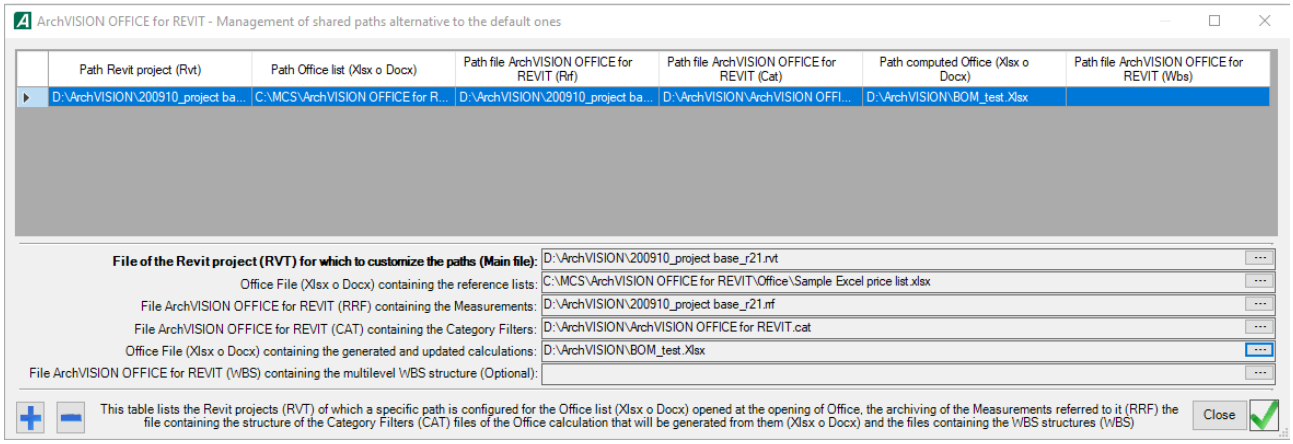
The tab at the top that allows you to choose whether to change the options relating to Excel or those relating to Word.

List a summary of measurements before exporting to Office: selecting this checkbox requires that the calculation summary window be proposed during the computation procedure (see § C.7).

When opening Office, it opens the reference list/calculation directly: it requires that when you open Excel / Word (using the appropriate ArchVISION OFFICE for REVIT functions) your reference list is also opened; selecting this option enables the field below. Pressing the button to the right of this field opens the dialog where you can choose the price list/calculation that will always be opened with Excel or Word.

In the field Number of decimal places in export, you must specify the number of decimal places with which you want to export the measurements in the Office document (this setting applies to all numeric values regardless of the field).

It is possible to define for certain projects customized paths for the ArchVISION OFFICE for REVIT reference files such as the .rrf file which contains all the measurements, the price list file, the categories, the calculation file created, and the WBS encryption if needed.



Finally, from this menu, is you can change the language and colors used by ArchVISION OFFICE for REVIT to indicate measurements, WBS, layering, deductions, and MEP.

C.9 Measurement import from another quantity take-off

ArchVISION OFFICE for REVIT allows the import of measurements from another project.

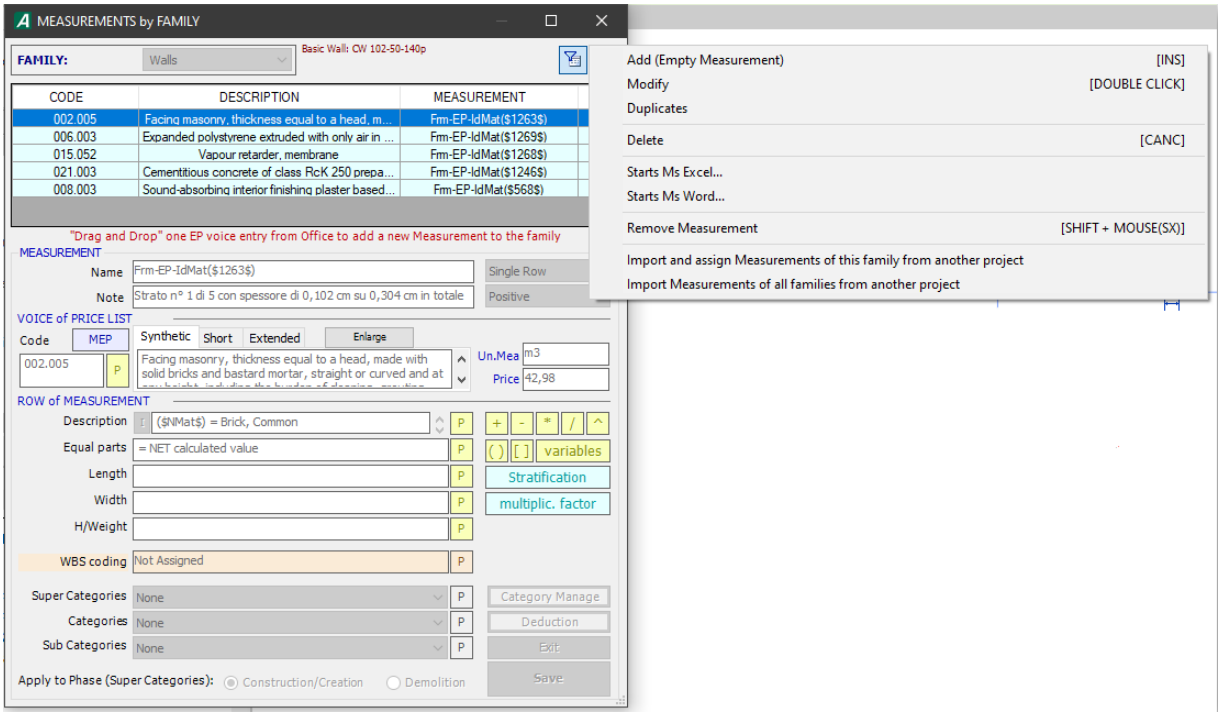
This functionality is performed in two operating modes:

1. Import and assign measurements of this family from another project

It allows you to automatically import and assign to the selected family all the measurements already made in another project relative to the selected family.

2. Import measurements of all families from another project

It allows you to import all the measurements already made for all families from another project: in this case, no measurement will be assigned to the project families: the association must be done manually.



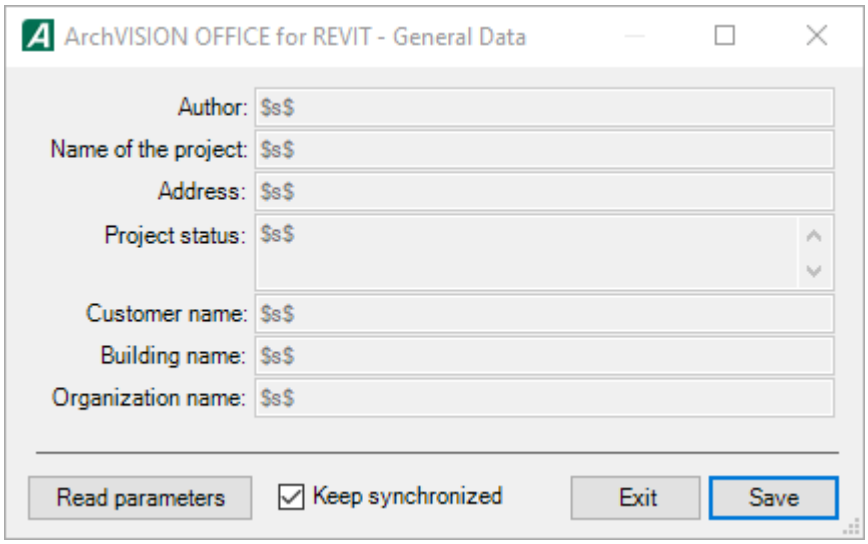
The functions for importing measurements from another project are available from the contextual menu that opens when pressing the button Functionality of the Measurements by family window (see § C.4.4).

C.10 Project Data

By selecting the “Project data” button, ArchVISION OFFICE for REVIT displays the General data dialog through which it is possible to store in the project some general information relating to the project itself. All stored general data will be automatically exported to the quantity take-off in the General Data section of the Calculation (.xlsx or .docx file) generated by ArchVISION OFFICE for REVIT

Note

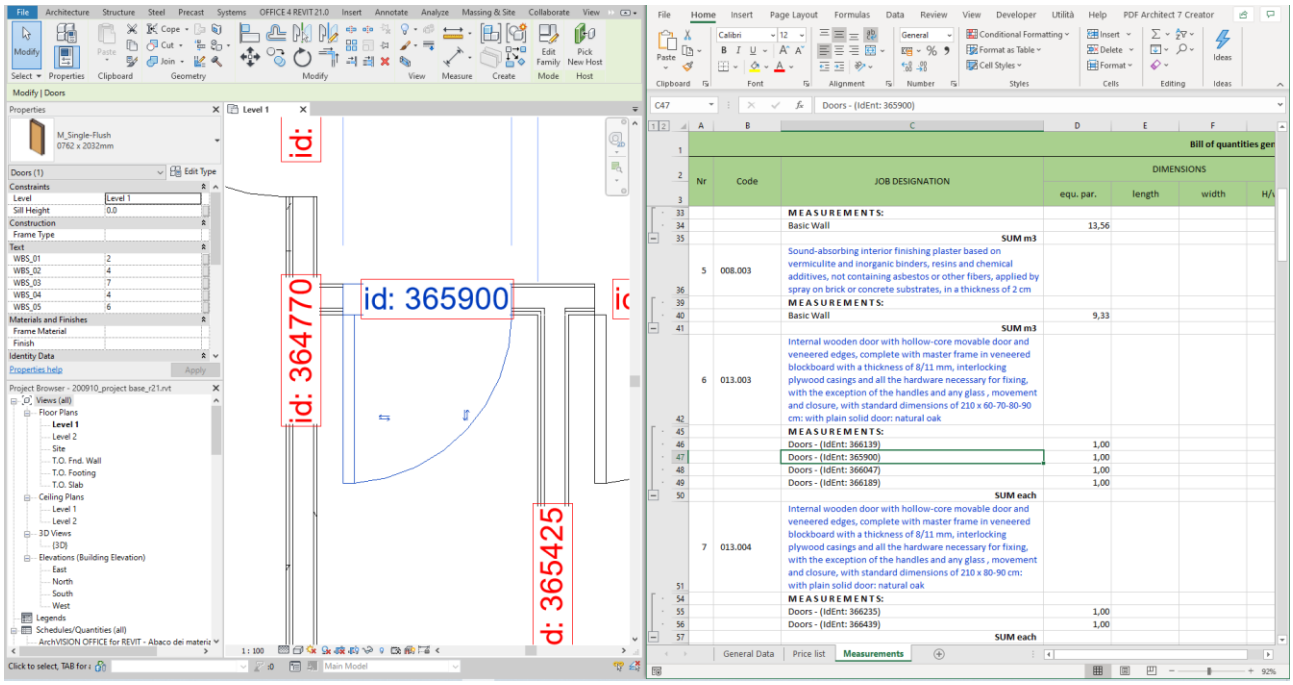
Regardless of the type of calculation export set, the project data introduced in ArchVISION OFFICE for REVIT will always have priority and will replace those present in the "General Data" section in the calculation exported to Office.



Project data can be directly obtained from project data compiled through the project parameters contained in Autodesk Revit. By clicking "Read parameters" you can read and fill in the fields; by checking the box "Keep synchronized" it is possible to associate the information exported in quantity take-off to the model information so that they are always updated.

C.11 Revit Find

Revit Find is an exclusive feature of ArchVISION OFFICE for REVIT that allows you to select the instance in the Autodesk Revit model to which the measurement refers starting from the quantity take-off in Microsoft Excel. simply select the box containing the item ID in the take-off quantity and press CTRL + C to automatically select the item in the Revit model. To work this feature requires that the measurement is of the multi-row type (see § C.6) and that it is made by object and not by material as it requires that the ID of the element be associated with the measurement.


id: 365900
id: 364770
id: 365425
Bill of quantities gen
Nr
Code
JOB DESIGNATION
DIMENSIONS
equ. par.
length
width
MEASUREMENTS:
Basic Wall
13,56
SUM m3
5 008.003
Sound-absorbing interior finishing plaster based on vermiculite and inorganic binders, resins and chemical additives, not containing asbestos or other fibers, applied by spray on brick or concrete substrates, in a thickness of 2 cm
MEASUREMENTS:
Basic Wall
9,33
SUM m3
6 013.003
Internal wooden door with hollow-core movable door and veneered edges, complete with master frame in veneered blockboard with a thickness of 8/11 mm, interlocking plywood casings and all the hardware necessary for fixing, with the exception of the handles and any glass , movement and closure, with standard dimensions of 210 x 60-70-80-90 cm: with plain solid door: natural oak
MEASUREMENTS:
Doors - (IdEnt: 366139)
1,00
Doors - (IdEnt: 365900)
1,00
Doors - (IdEnt: 366047)
1,00
Doors - (IdEnt: 366189)
1,00
SUM each
7 013.004
Internal wooden door with hollow-core movable door and veneered edges, complete with master frame in veneered blockboard with a thickness of 8/11 mm, interlocking plywood casings and all the hardware necessary for fixing, with the exception of the handles and any glass , movement and closure, with standard dimensions of 210 x 80-90 cm: with plain solid door: natural oak
MEASUREMENTS:
Doors - (IdEnt: 366235)
1,00
Doors - (IdEnt: 366439)
1,00
SUM each
General Data
Price list
Measurements

Summary

C.2.2 Association to a Measurement to an Instance

C.3 OFFICE 4 REVIT 21.0 toolbar

C.4 Archive Measure: Measurements Window

C.4.1 How to Create a Measurement in Archive Measurements

C.4.2 How to Associate a Measurement with an Instance

C.4.3 How to Modify a Measurement Associated with an Instance

C.4.4 How to Associate a Measurement with a Family

C.4.5 How to Edit a Family Measurement

C.5 Row of Measurement content

C.5.1 Variables

C.5.2 @ Variables from Instances/Objects

C.6 Measurement methodologies

Positive and negative

Multi-row single-row

Measurements by materials

C.7 Quantity take-off export

C.8 Quantity take-off preferences

C.9 Measurement import from another quantity take-off

C.10 Project Data

C.11 Revit Find