Object creation

Schaffen von Objekten

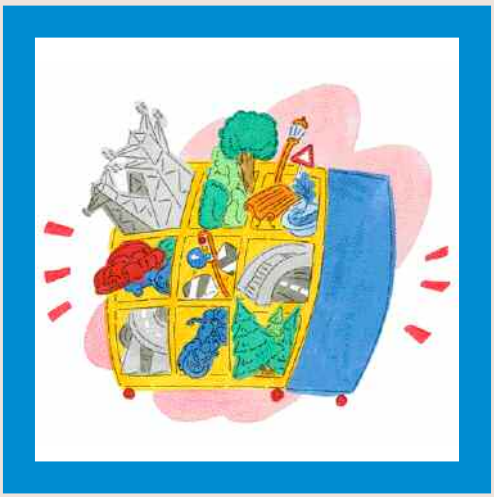
Creazione di oggetti

Création d'objets

Creación de objetos

ArchiForma™

vers. 2.0



PLUG-IN FOR ARCHICAD®

Cigraph

ArchiForma™

User Guide

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ArchiForma “User Guide”
Version 2.0 for Microsoft Windows and Apple Macintosh

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Contents

ArchiForma 2.0

The ArchiForma 2.0 Plug-In

This Plug-In has been designed for ArchiCAD users wishing to generate complex three-dimensional shapes without using GDL software.

Designers are often engaged in creating special shapes as furnishing elements or customized structural solutions.

ArchiForma makes designing easy and amusing with a set of multi-task problem-solving tools that process graphic primitives or extrusions and surfaces

A small graphic shaper with unparalleled performance.

Software Installation

Select the Plug-In folder that you purchased from the installation CD, and copy it in the Add-Ons folder contained in the the ArchiCAD folder which is installed in your computer.

If you carried out successfully the installation, once you restart ArchiCAD, the Extra menu will display a submenu that enables you to display or hide the application Palette.

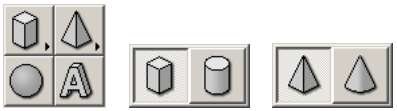
The plug-in includes the library of the elements required for running.

ArchiForma tools Palette

The Palette gathers all the ArchiForma tools ordered logically by type and function.

The first group contains the buttons to create simple three-dimensional primitive prisms, cylinders, cones, pyramids, spheres and three-dimensional texts.

The arrow placed on the lower right side of a button icon, reminds you that other typologies are available. Keeping pressed the mouse button, you can display the remaining tools.



The second group contains the three-dimensional tools that need two-dimensional outlines (fills) to create the required shape. This refers to extrusions, tubing and surfaces.

For next, the group for the editing of three-dimensional ArchiForma already inserted elements, such as explosions, rotations, cuts.

Finally, the Miscellaneous group, which includes either tools for the element editing or saving and general editing ones.

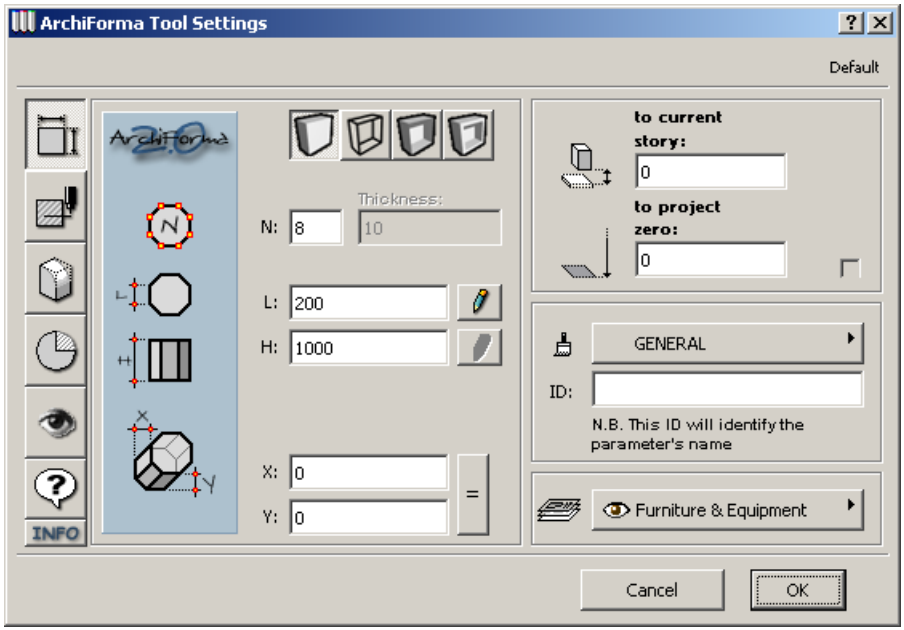
Common commands of the standard dialog window for ArchiForma tools

All the tools in the ArchiForma palette have the same settled dialog window. Let's proceed, in this section, with the common settings.

Let's take as an example the prism tool: click on the first icon upside on the left.

The standard dialog window of the ArchiForma settings is now displayed.

We can divide it virtually into three parts:



On the left, there are seven buttons to cross through the several configuration boxes. The buttons are common to all the tools: they may be disabled when they have no relation with the selected tool.

The central section changes according to the selection and contains the real settings of the tool. A graphic description explains clearly the interface.

The section on the right, which remains unchanged a part from the selected editing mode, contains the level, material and layer settings.

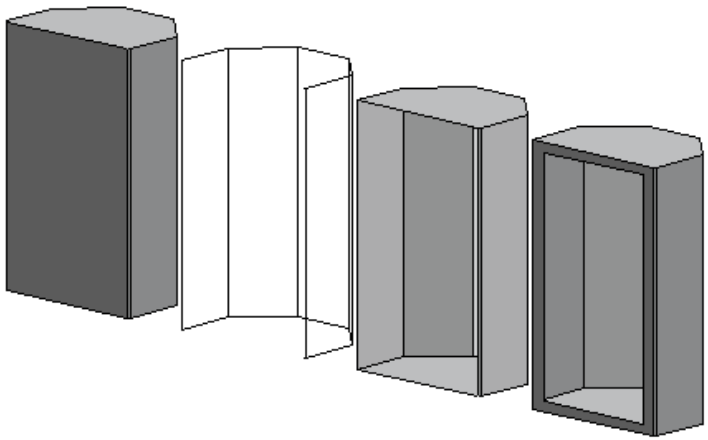
The first button on the left, the parameters button, identifies the configuration of the elements in terms of shape, dimension and distortion.

On the displayed upper section of the central box, it's possible to select the element you need to create, which can be solid, wire-shaped, empty or thick.

This option is common to all the dialog boxes of the ArchiForma elements, but some of them could be disabled, according to the specific cases lately described in this manual.

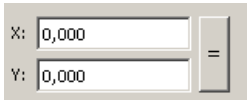
For the first three visualizations, no further parameters are required, while if you choose the thickness mode, you enable the proper field for entering the numerical value.

Here is an example of each typology:

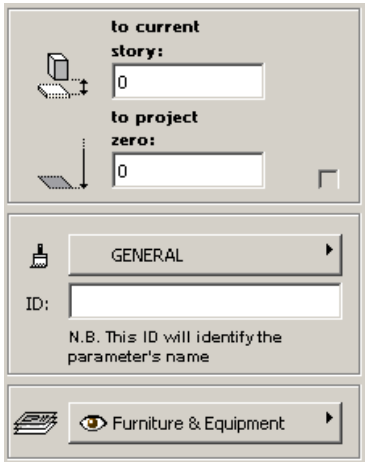


The central section changes according to the element you need to create, so that the settings for each ArchiForma element, will be specifically explained here below.

On the other hand, the last two editing fields are common to all the elements. They allow you to translate the element you need to create on the X- and Y-axis. Obviously, you can do the same action on a single axis. If you enable the button next to the two axis, the translation value of both will be equal. The reference value is always the one of the X-axis.



The right section of the window remains always unchanged. As for the ArchiCAD dialogs, you can enter the element level as regards the current story or the zero project point.

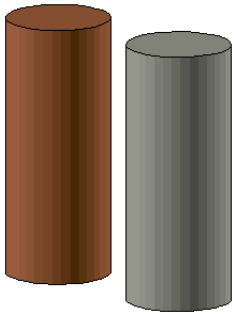


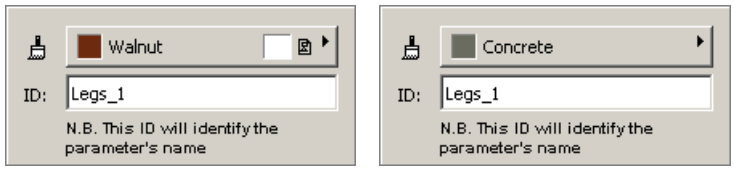
When you work in the 3D window, these values are disabled as a standard, though you can key on the level value by activating the check-box on the bottom right of the field.

The ID setting plays a primary role because it represents the GDL variable of the material (as in the most common used modelers).

Let's make it clear with the following example

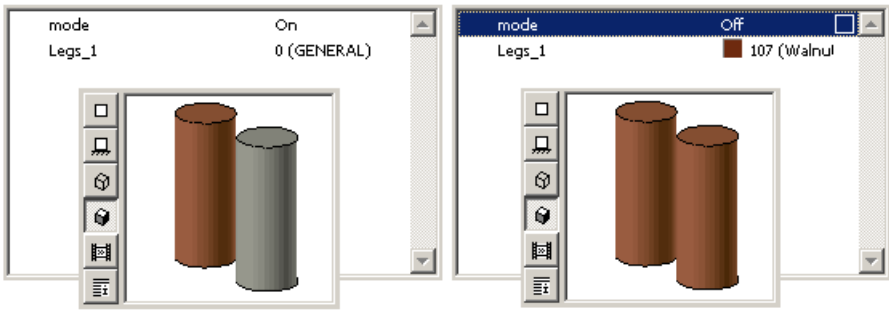
Generate two prisms with two different kind of materials but keep the same ID.





Save them as single objects and, on the editing dialog window, it will be displayed a single material variable, so that you won't be able to change the material of one prism only.

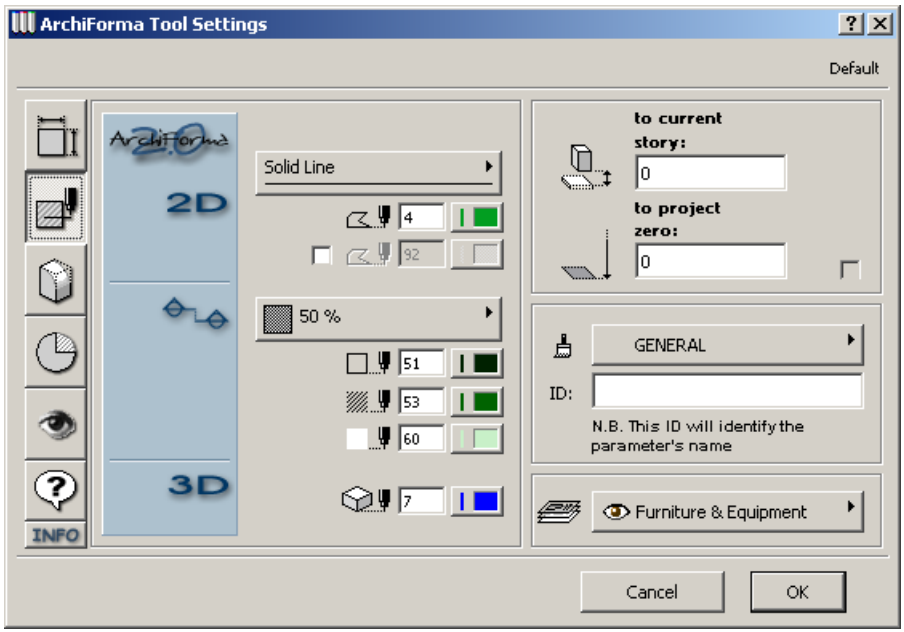
If you give the two prisms different IDS, on the other hand, you will be free to choose between two different materials.



The last setting of this dialog box, is a pop-up menu with which you can choose the layer of the element to create.

The attributes box

The attributes button controls the plan, section and 3D details, in terms of the element display.



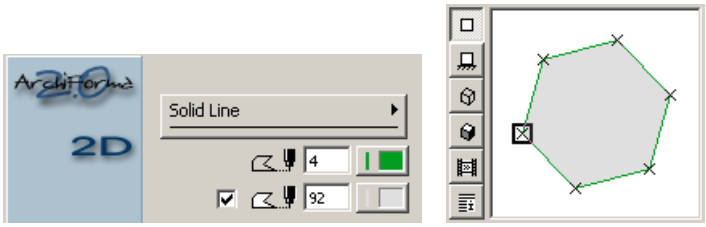
This box remains unchanged for all the elements of the tools palette, this is why it will be described only in the present section. All the elements here below described, have a reference to this section.

The first part refers to the plan attributes, i.e. the line type, the color pen for the perimeter and the background fill of the object.

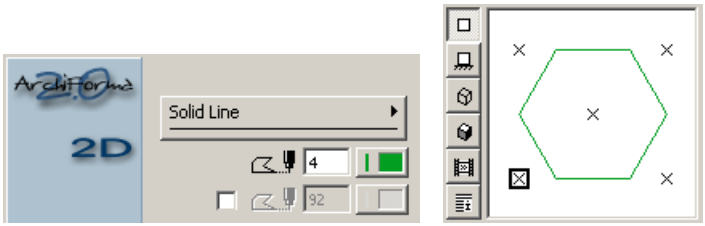
We recommend that you enable the check-box for the background fill even when using a white or a transparent pen.

Let's make it clear with the following example:

- See the example and generate a prism enabling the fill check-box. If you save this element as an object in the .gsm format (see the "Save as ArchiCAD object Tool" described later on in the manual) you will notice that each vertex has an hotspot which can ease you while putting the object on the plan.



- By disabling the fill check-box, the hotspots of the saved object will be positioned only at the corners of the overall perimeter and in the center.



The remaining section settings, referring to section and 3D, are like those normally used in the ArchiCAD dialog windows.

In this section, you can set the fill of the element (if cut), the outline pen, the fill pen and the background fill pen. For the 3D option, you can set the ArchiForma pen to display the element.

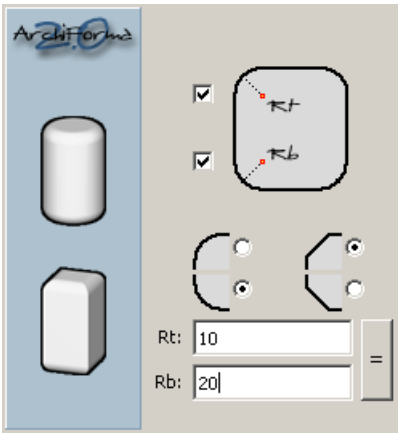
The right frame section remains unchanged.

The rounding box

With the rounding button, you can access the section to round or to chamfer the base and/or the element top you generated.

With the first two check-boxes, you can decide where to work (on the base, on the top or on both), while with the check-boxes right below, you can choose how to act on the element (by rounding or by chamfering).

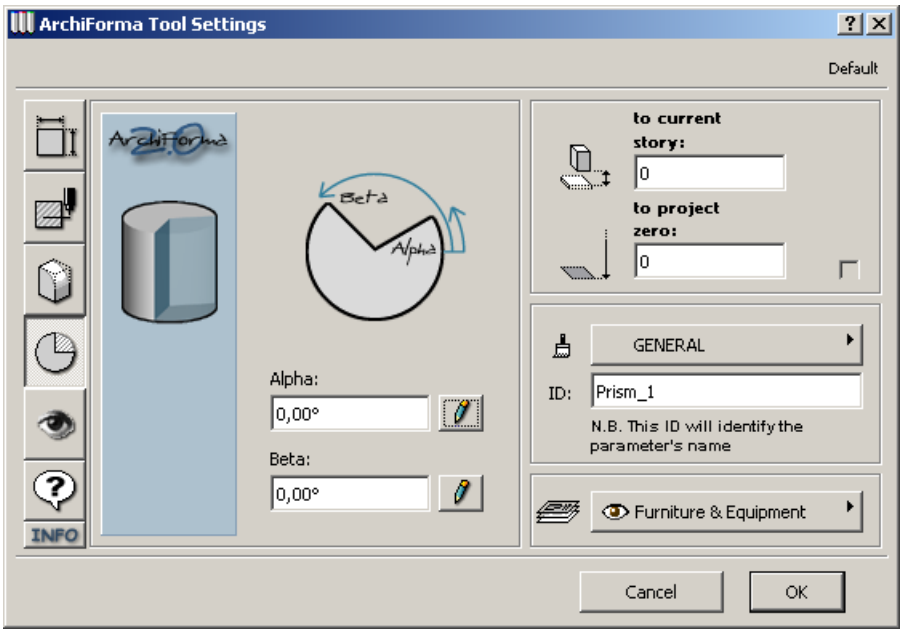
When the check-boxes are activated, the preview of the reference element changes in order to help you with the object setting.



On the lower part of the box, in the two numerical fields, you need to enter the rounding or chamfering radius either for the top (Rt) or for the base (Rb). By enabling the side button, you can make the two values equal. If you press the button, after entering two different values in their fields, the field of reference will be the upper one (Rt).

The development box

With the **developing** button, you can define the developing angle of the possible cut of the element.



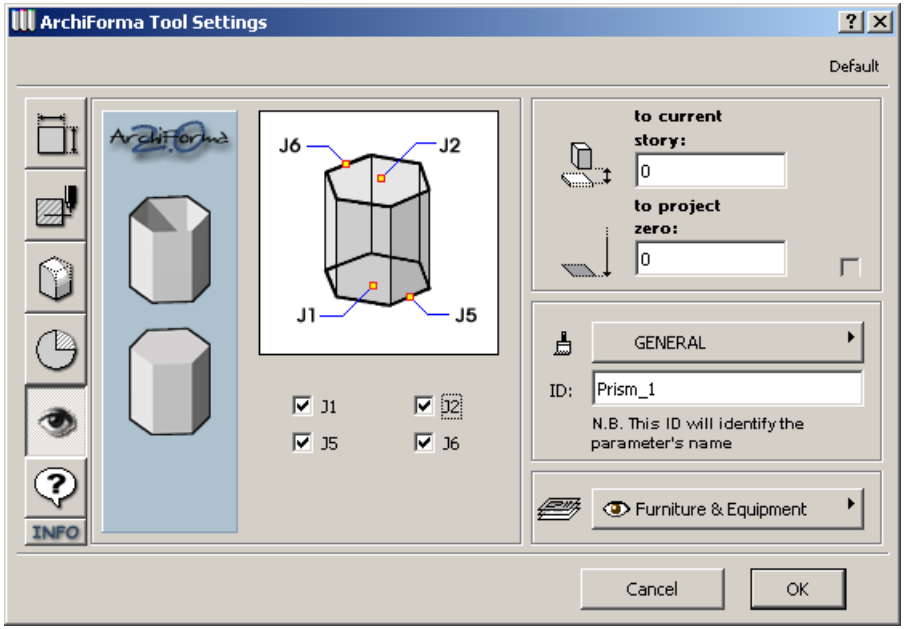
Two variables must be defined: Alpha defines the angle from where the cut development starts and Beta sets its end.

Next to the two numerical fields, there are two buttons showing a pencil icon. By pressing one of them, you can define these values in a graphic mode: either if you are working in the plan window or in the 3D window. Whenever this option is enabled, the numerical input fields are disabled.

Once confirmed the settings, in the plan window and in the 3D window, (after inserting the element) the first click sets the Alpha value while the second one sets the Beta value.

The visualization box

In the **visualization** section, you can define the visualization settings of the element.



You can decide to visualize or not the edges and/or the upper or lower surfaces. This setting depends on the tool used with ArchiForma. For more detailed information, see the following description of each element.

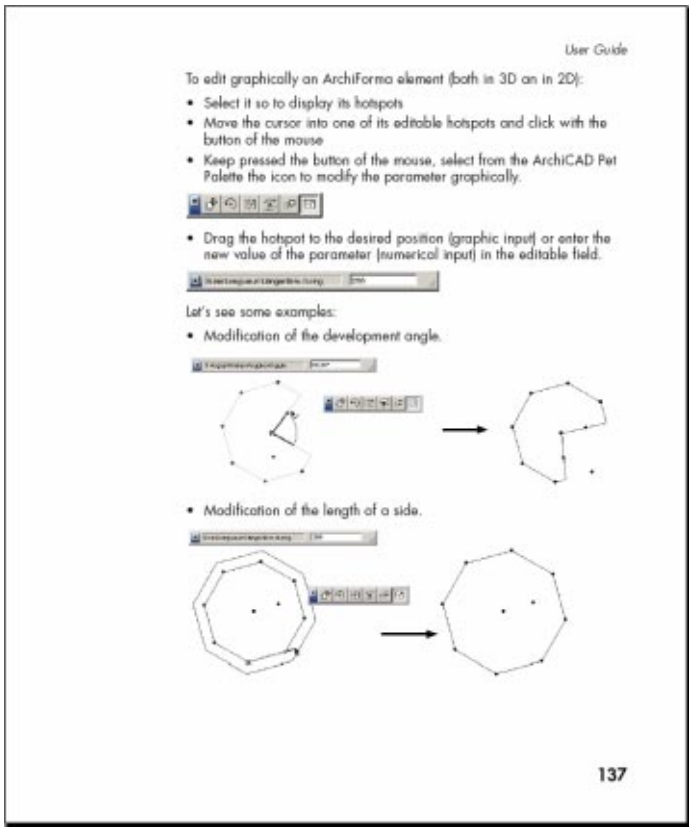
The use of an edges-free visualization can help you in case you have to superpose several ArchiForma elements. In this case, on the 3D visualization, the overall will displayed as a single element, without bothersome joining lines.

For more detailed information on the meaning of these values (called “mask values”), please refer also to the GDL manual, enclosed to the ArchiCAD software box.

The help box

The last section, identified by this icon, refers to the **on-line help**.

By clicking on this button, ArchiForma will make reference to the section of the interactive manual explaining the use of the selected tool.



User Guide

To edit graphically an ArchiForma element (both in 3D an in 2D):

- Select it so to display its hotspots
- Move the cursor into one of its editable hotspots and click with the button of the mouse
- Keep pressed the button of the mouse, select from the ArchiCAD Pet Palette the icon to modify the parameter graphically.

- Drag the hotspot to the desired position (graphic input) or enter the new value of the parameter (numerical input) in the editable field.

Let's see some examples:

- Modification of the development angle.

- Modification of the length of a side.

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The information box

The **information** box opens the Cigraph Factory box, the Plug-in developer.

The Simple Three-dimensional Primitives by ArchiForma

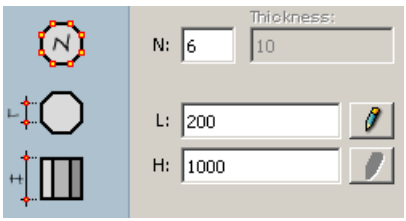
Regular Prisms and Cylinders

The Prism

The first button on the palette helps you to create regular prisms and cylinders.

The parameters box

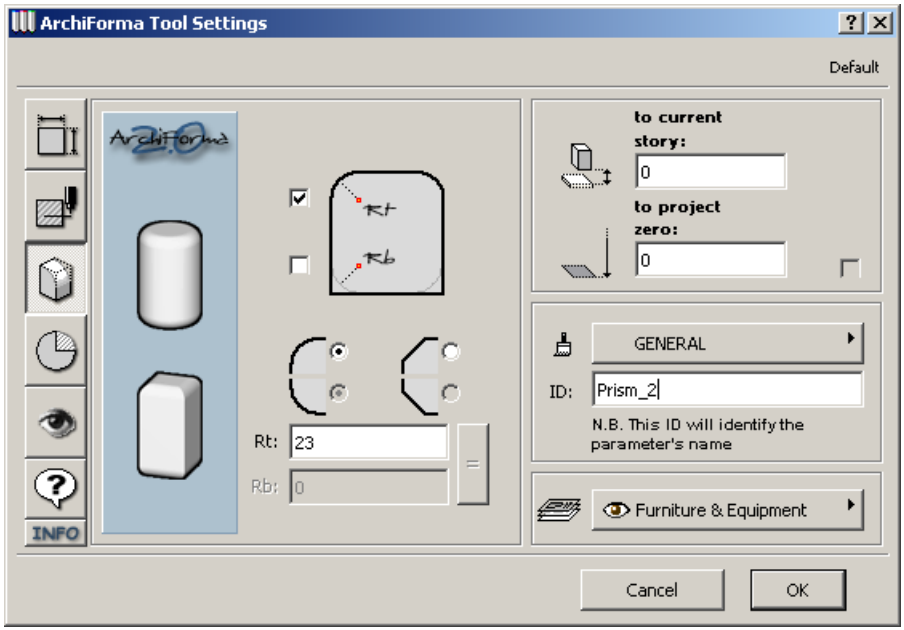
Start by clicking on the Prism icon. ArchiForma displays as a standard the **parameters** dialog box, partially previously described in this manual.

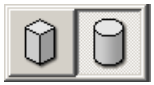


The main setting focuses on the numerical field for the entering of the number of the prism sides. It can change from 3 (as a minimum) to 255 (as a maximum).

The two following numerical fields refer respectively to the side length and to the prism height. Both values can be set also graphically. If you are working in the Plan Window, you can define graphically the length of the prism side, while its height can be set only numerically. If the current working window is the 3D window, you can define both values graphically. With your first click you activate the insertion point of the prism, with the second you refer to the side length and with the third you define the element height.

Refer to the already described paragraph *The common commands in the dialog box of the ArchiForma* tools for the description of any setting of the element deformation and the remaining sections.


ArchiForma Tool Settings
Default
INFO
to current
story:
0
to project
zero:
0
GENERAL
ID:
Prism_2
N.B. This ID will identify the
parameter's name
Rt:
23
Rb:
0
Furniture & Equipment
Cancel
OK

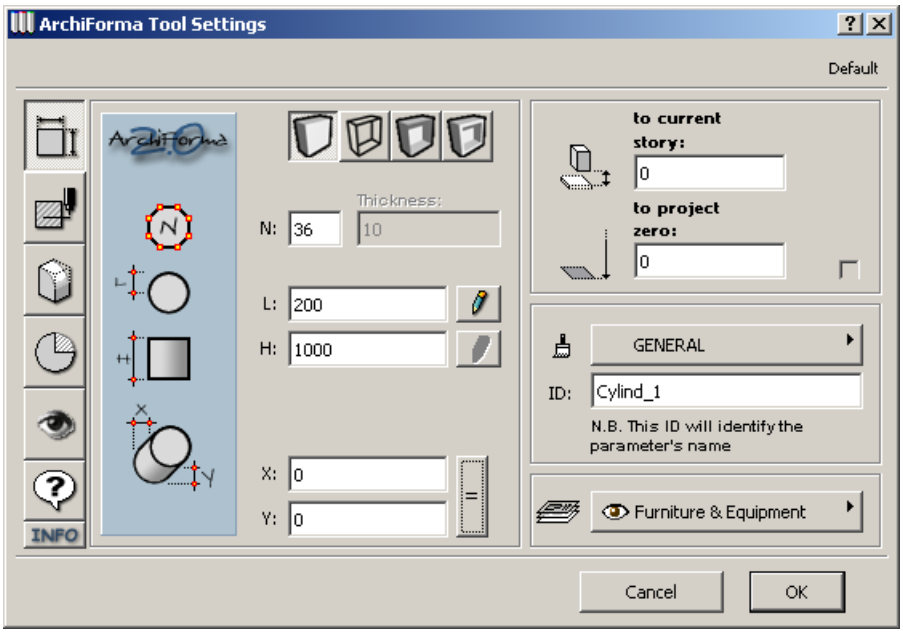


The Cylinder

Click on the Cylinder button. The dialog box displayed as standard is the settings dialog box for editing.

The parameters box

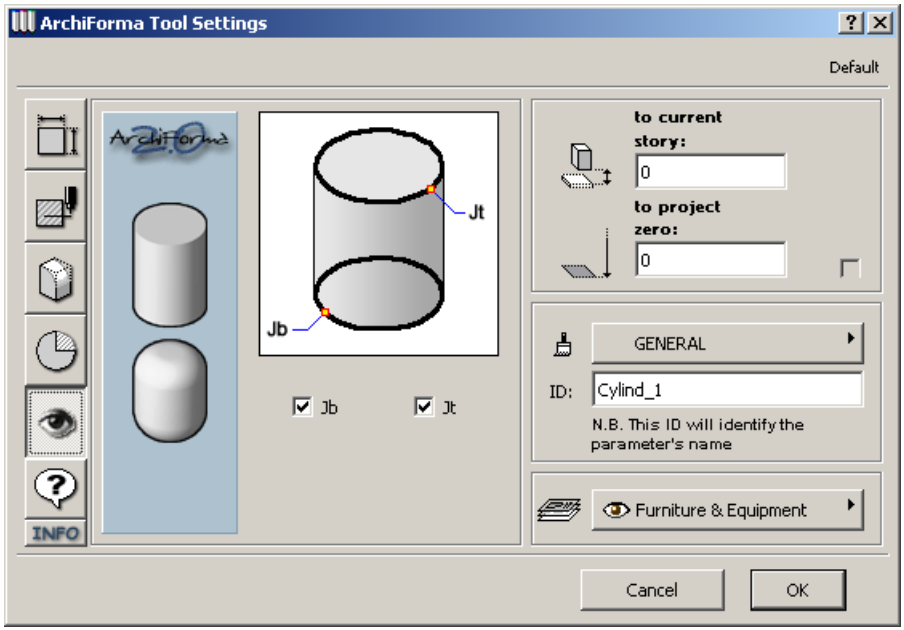
In the numerical input field identified by the letter "N", you need to key in the number of partitions into which you need to divide the circle. This value ranges /changes from a minimum of 3 to a maximum of 255 partitions. The higher this value is, the more exact the curve resolution results, but the element you create will be heavier.



In the numerical input field identified by the letter "L", you need to set the cylinder radius, while its height in the one identified by the letter "H". Both values can also be defined graphically. If you are working in the Plan window, you can define graphically the radius of the cylinder while its height can be set only numerically. If the active window is the 3D window, you can define graphically both values.

With your first click you define the insertion point of the prism, with the second you define the radius length and with the third you define the element height.

Refer to the already described paragraph *The common commands in the dialog window of the ArchiForma tools* for the description of how to set the element deformation and the remaining sections.



The Pyramid and the Cone

The Pyramid

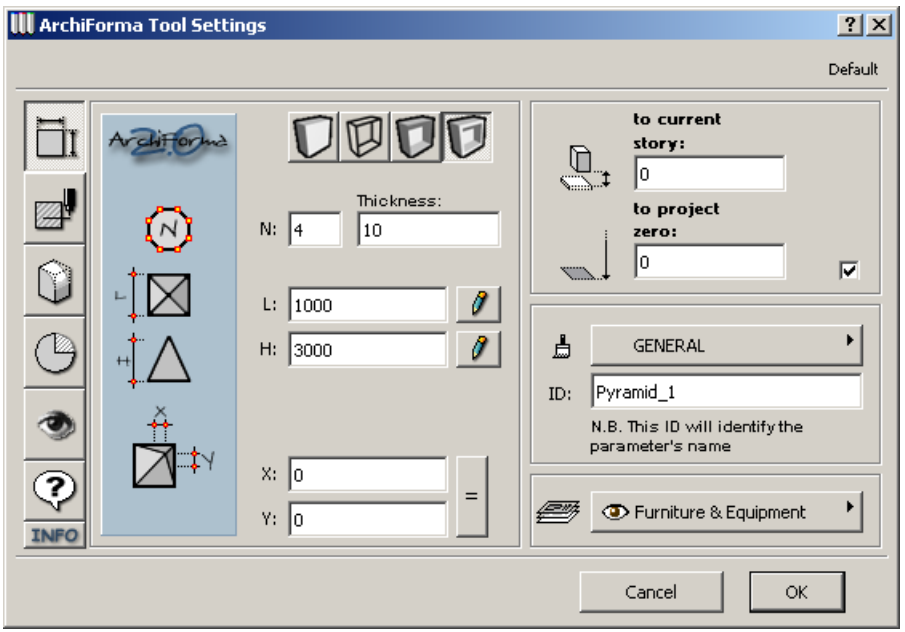
The following palette button can be used to create regular and irregular Pyramids.

There are two methods to create these elements. You can select directly the command from the ArchiForma palette and then generate regular pyramids, or create a basic fill, and once selected, you can click on the tool icon to use it as the base of your pyramid.

Let's see first the standard method.

The parameters box

Click on the Pyramid tool icon.



In the numerical input field identified by the letter "N", you need to key in the number of sides you need to assign to your pyramid. This value ranges/changes from a minimum of 3 to a maximum of 255 partitions.

In the numerical input field identified by the letter “L”, you need to set the length of the pyramid side, while its height is set in the field identified by the letter “H”. Both values can be also defined graphically with a click on the button with the little pencil. If you are working in the Plan window, you can define graphically the side of the pyramid while its height can be set only numerically. If the active window is the 3D window, you can define graphically both values.

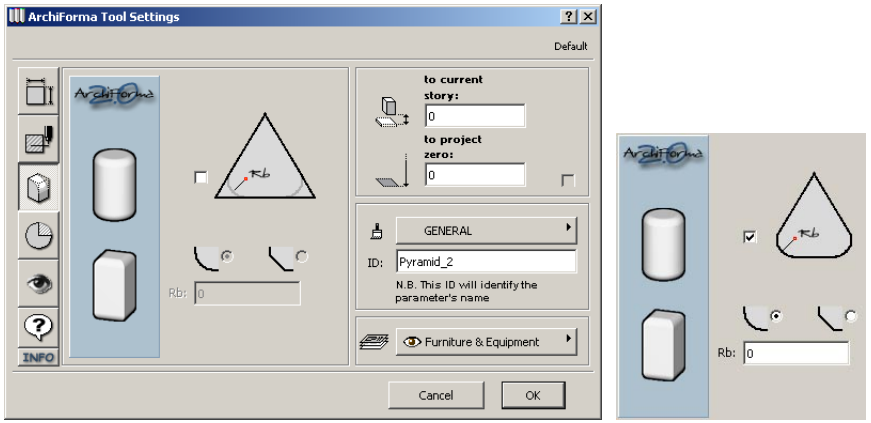
With your first click you define the insertion point of the pyramid, with the second you define the side length and with the third you define the height of the regular pyramid.

Refer to the already described paragraph *The common commands in the dialog window of the ArchiForma tools* for the description of how to set the element deformation and the Attributes box.

The rounding box

In this section, you can set the rounding or the chamfering of the pyramid base. Enable the appropriate check-box to display the preview of the resulting element.

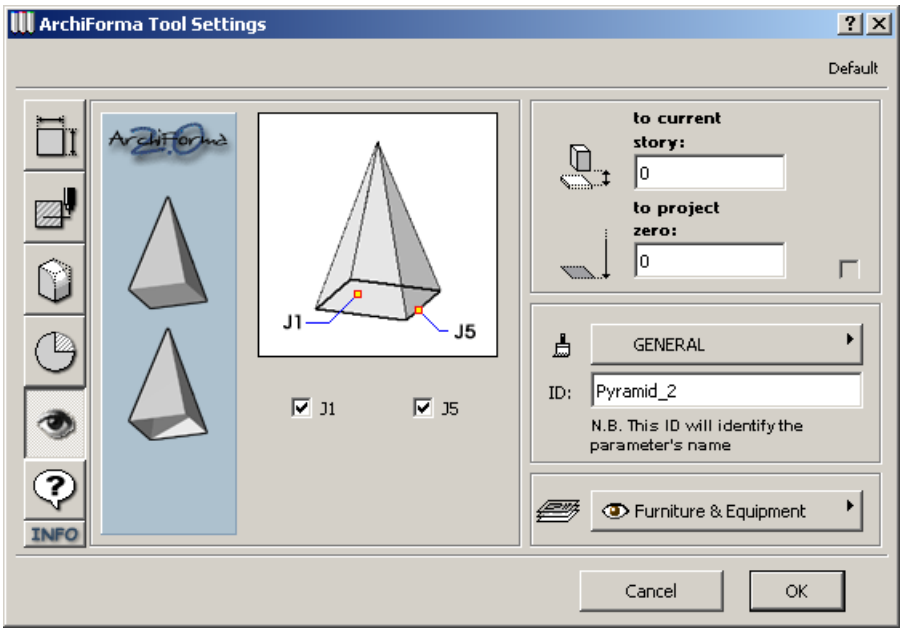
In the numerical input field "Rb”, you may set the rounding or chamfering curve radius.



The description of the section *The development box* is reported on the paragraph *The common commands in the dialog window of ArchiForma tools*.

The visualization box

You can decide to display or not the element edges. Obviously, this refers only to the edges and the lower sides of the pyramid.



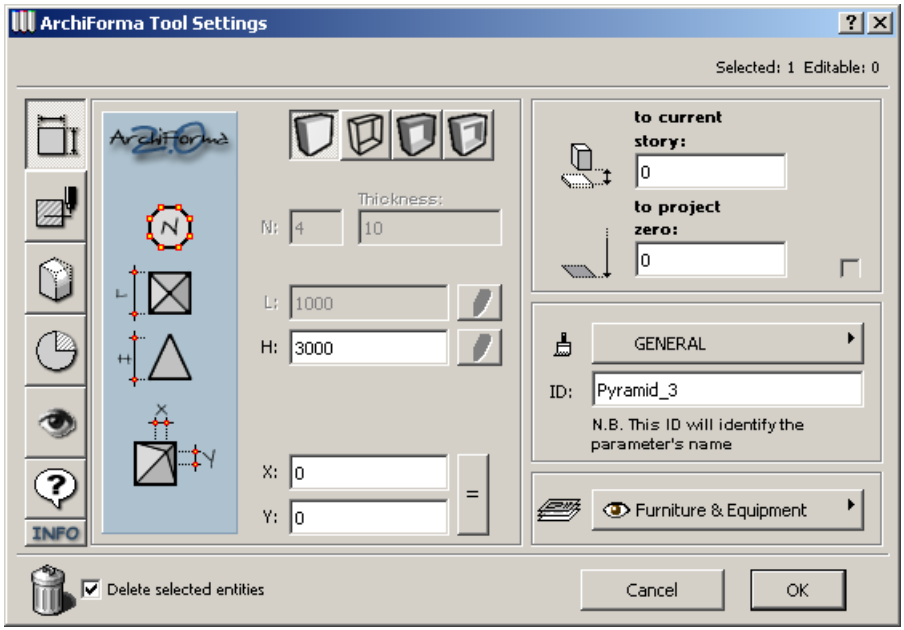
The other method for the pyramid creation, allows you to create irregular elements.

With the ArchiCAD fill tool, draw a shape as you like. Select it and click on the Pyramid tool of the ArchiForma palette. The cursor turns into a pencil ready to set with a click, the projection position of the pyramid vertex on the plane. This point may be both inside and outside the fill surface.

Once you click on it, ArchiForma displays the **parameters settings box**.

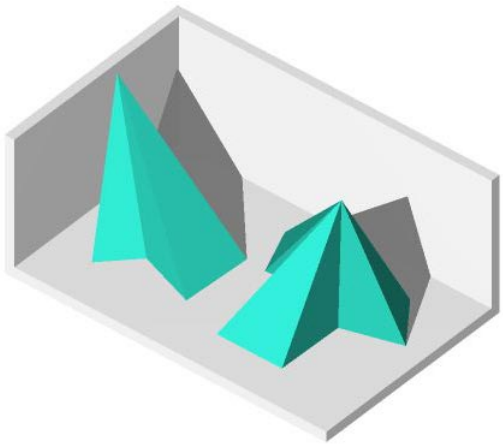
As you can see in the figure below, some settings, i.e. the number of sides and their length, are disabled (as these information are drawn from the fill shape).

Both height and deformation along the X and Y-axis remain unchanged. With this creation method, you cannot define graphically the height of the pyramid.



In the lower left section of the box, you can delete the fill used for the element base, by enabling the check-box (next to the trash icon). If the check-box is disabled, after creating the pyramid, you will find in the plan the two-dimensional shape, ready to be re-used.

This creation procedure does not modify the other settings of the tool. See the previous paragraphs for more details.



The Cone

The second section of the palette is dedicated to the creation of regular Cones.

The parameters box

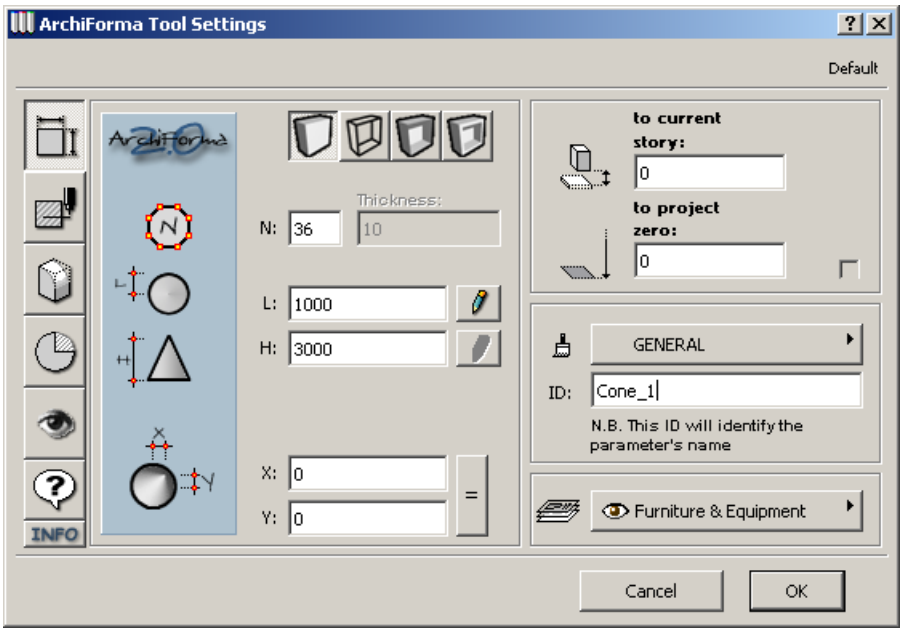
Fate click sull'icona dello strumento Cono.

Click on the Cone tool icon.

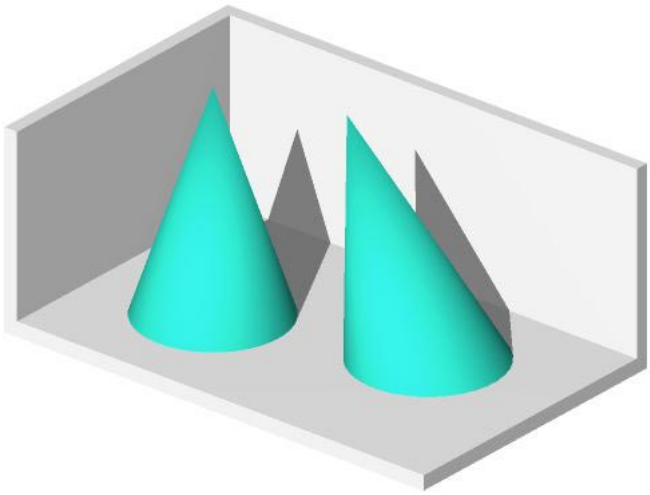
In the numerical input field identified by the letter "N", you need to key in the number of parts into which you need to divide the circle. This value ranges/ changes from a minimum of 3 to a maximum of 255 partitions. The higher this value is , the more precise the curve resolution results, but the created element will be heavier.

In the numerical input field identified by the letter "L", you need to enter the radius of the cone, while its height in the field identified by the letter "H". Both values can also be defined graphically. If you are working in the Plan window, you can define graphically the radius of the cone, while its height can be set only numerically. If the active window is the 3D window, you can define graphically both values.

With your first click you define the insertion point of the cone, with the second the radius length and with the third the height of the element.



Refer to the already described paragraph *The common commands in the dialog window of the ArchiForma tools* for the description of how to set the element deformation and the remaining sections.

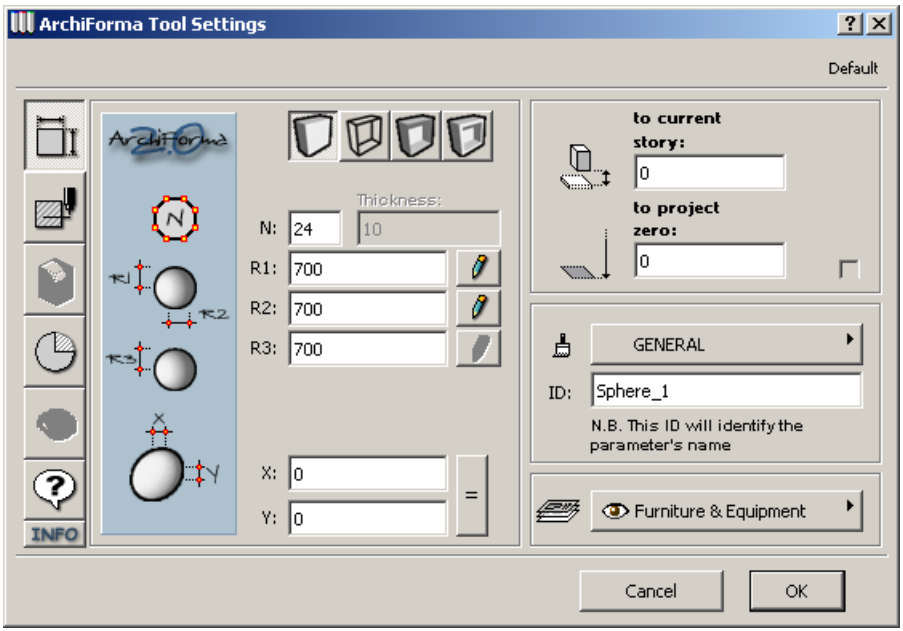


The Sphere

Click on this icon to create a regular or irregular sphere.

The parameters box

Click on the sphere icon tool.



In the numerical input field identified by the letter "N", you need to key in the number of parts into which you need to split the sphere. This value ranges/changes from a minimum of 3 to a maximum of 255 partitions. The higher this value is, the more precise the curve resolution results, but the element you create will be heavier.

The numerical editing fields of the three radii of the sphere (R1, R2, R3) come just after. If the entered values are equal, the created element will be a regular sphere.

The three values can be also defined graphically. If you are working in the Plan window, you can define graphically the values R1 and R2, while the R3 value can be set only numerically. If the active window is the 3D window, you can define graphically all the three values.

Please Note *If you are defining graphically the two R1 and R2 radii and you want to assign the same value to both of them, force the cursor to move towards 45°, 135°, 225° or 315° or towards 0°, 90°, 180° or 270°.*

The preview displayed by ArchiForma will show you how the two radii take the same value when following the cursor movement.

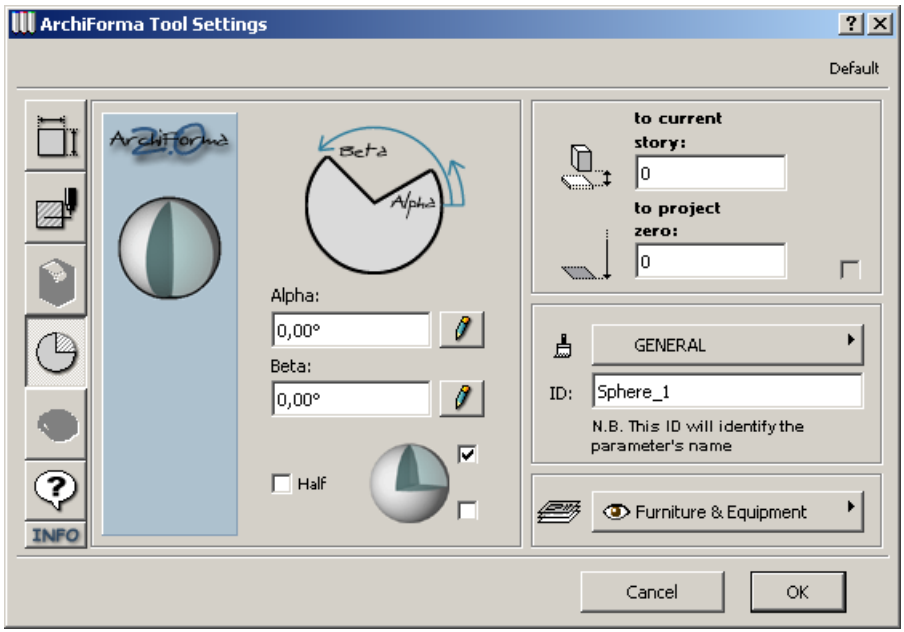
With your first click you define the insertion point of the sphere, with the second, the third and the fourth you define the three radii of the element.

Refer to the already described paragraph The common commands in the dialog window of the ArchiForma tools for the description of how to set the element deformation and the Attributes box.

The section *The rounding box* is not available for this tool.

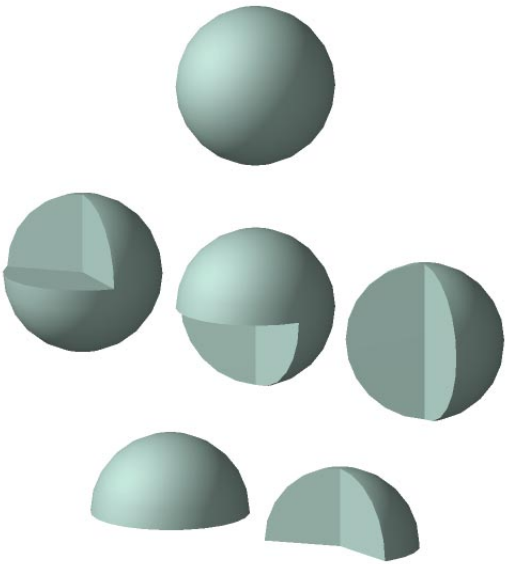
The Development Box

Click on the Development button icon.



The Alpha and Beta values setting had been previously explained. However, with this tool you can also create semi-spheres, simply by enabling the corresponding check-box. Furthermore, you can also decide to give a special development only to one of the sphere halves using the side check-boxes.

Once again, graphic systems represent a great help
Let's see some examples:



The 3D text

Click on this button to create three-dimensional texts of several shapes and forms.

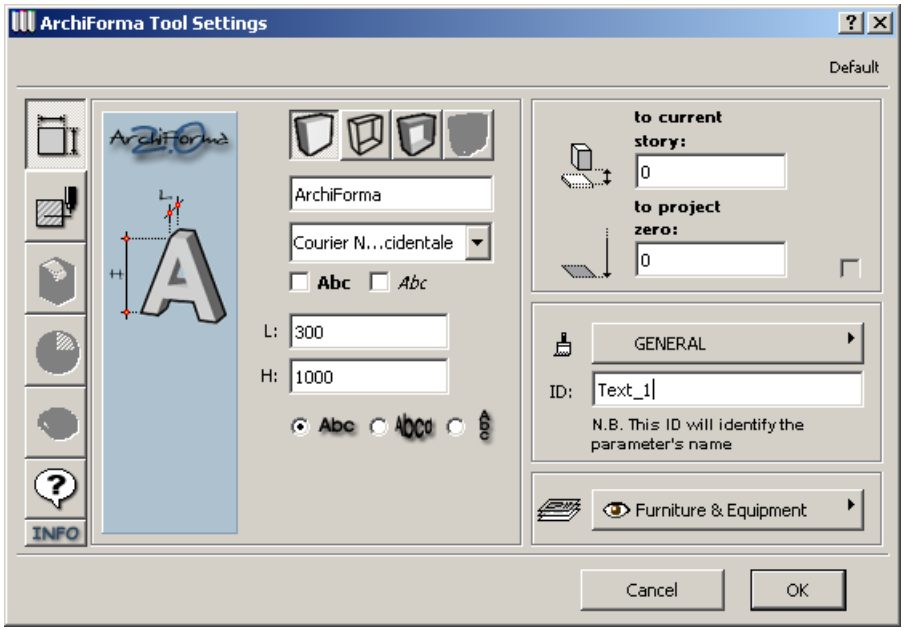
The Parameters Box

Click on the 3D text tool icon.

In the first text-editable field, you must enter the text or the word you need to represent in 3D.

You can then choose the needed font by scrolling the corresponding pop-up menu. The available fonts are those installed in the computer.

With the two check-boxes, you can assign/give a style to the selected font (bold and/or Italic). As a standard, these fields are disabled.



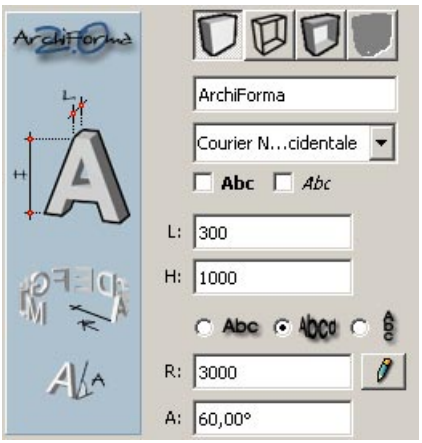
In the numerical field identified by letter “L”, define the text thickness (as is appears in the preview next to the settings), while in the field below (called “H”) define the height.

Finally, set the text layout (horizontal, curved or vertical).

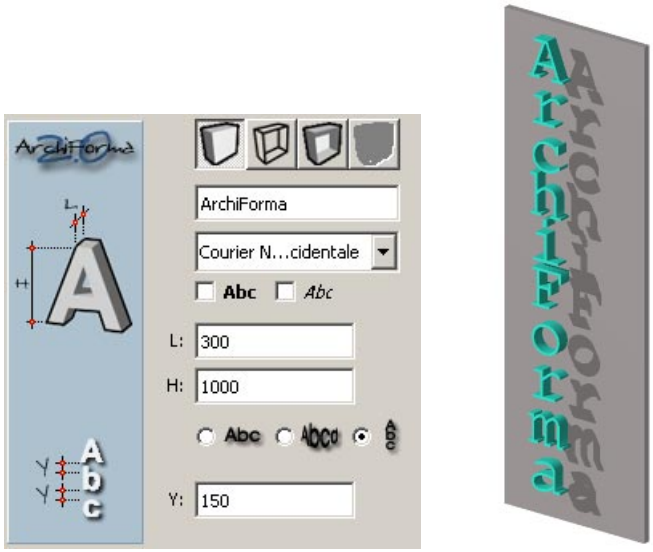
If the horizontal option is enabled, no further information will be required and, after setting the attribute values, you can continue by entering the “text” element in active worksheet window.

Both in the Plan and in the 3D window, with your first click you define the insertion point of the element and then the direction.

If you select the curved configuration, the dialog box displays two new editable fields: respectively for the radius of the curvature, which can be also defined graphically (enabling the "enter graphics" button), and for the inclination of each character with reference to the plan of the text itself.



The third available option is the vertical one: here you need to key in the leading value between two characters.



If also you need to create a slope text respect to the bearing surface, you will have to use the rotation tool described later on in this manual.

Refer to the already described paragraph *The common commands in the dialog window of ArchiForma tools* for any setting of *The attributes box*.

The remaining sections are not available for this tool.

Extrusions

ArchiForma provides four kinds of extrusions.

These elements are generated by extruding ArchiCAD fills previously positioned on the plan.

The Simple Extrusion

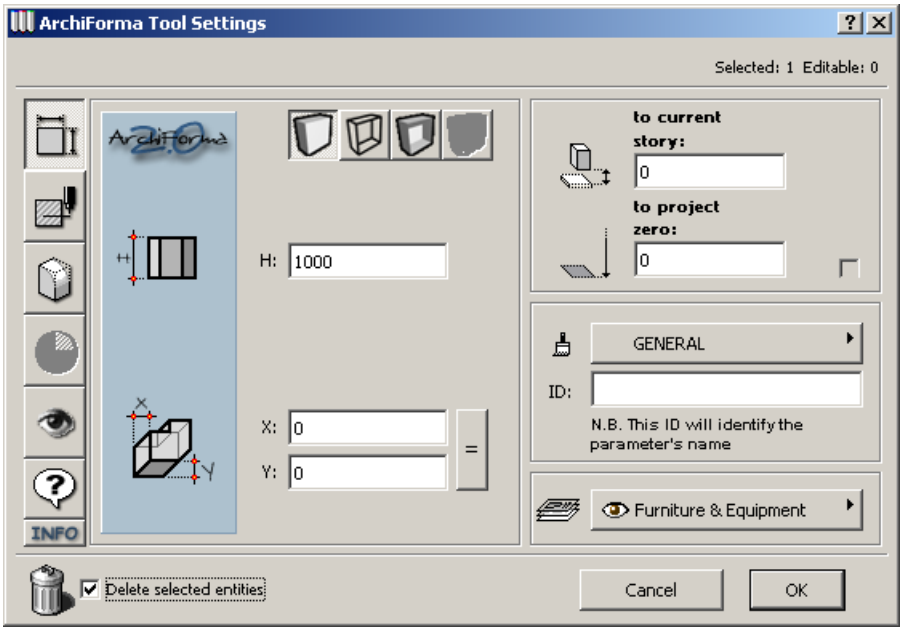
The first extrusion displayed on the palette, is the simple one.

First, draw the shape you need to extrude with ArchiForma on the plan, using the ArchiCAD fill tool. One of the features provided by this tool is the option to create shapes with holes. Just make the hole in the fill used as a base, with the ArchiCAD standard technique.

By drilling the extrusion element in this way, instead of using the Hole tool (described here below), you can round/chamfer the hole sides.

Select then the fill you created, and click on the simple extrusion icon.

The Parameters Box



In the first numerical editing field identified by the letter “H”, you need to enter the element height, (that’s to say the vertical extrusion value).

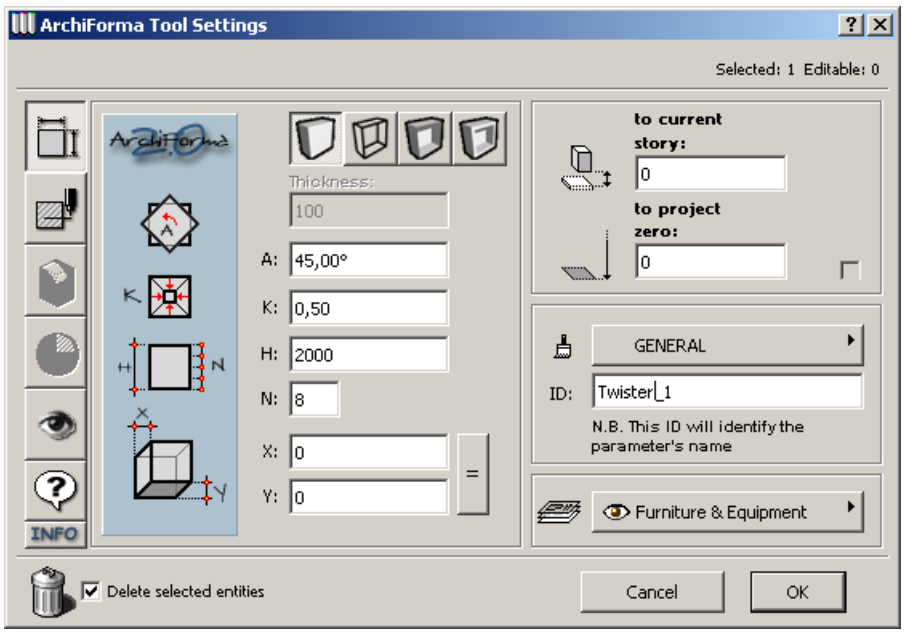
On the left lower side of the box, if you activate the check-box with a trash next to it, you will be able to remove the fill you used as the element base. If the check-box is disabled, on the plan you will find the two-dimensional shape ready for to be used.

Refer to the already described paragraph *The common commands in the dialog window of ArchiForma tools* for any setting concerning *The attributes box*.

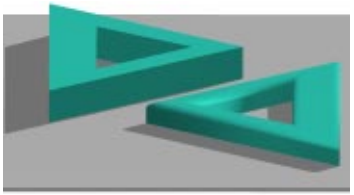
The Rounding Box

Besides the settings previously described in this section, you can choose to enable ,or not, the "include holes" check-box to include also the hole elements in your processing of rounding/chamfering.

"Rt" and "Rb" values will be the same as those set for the base and/or the top of the extrusion.

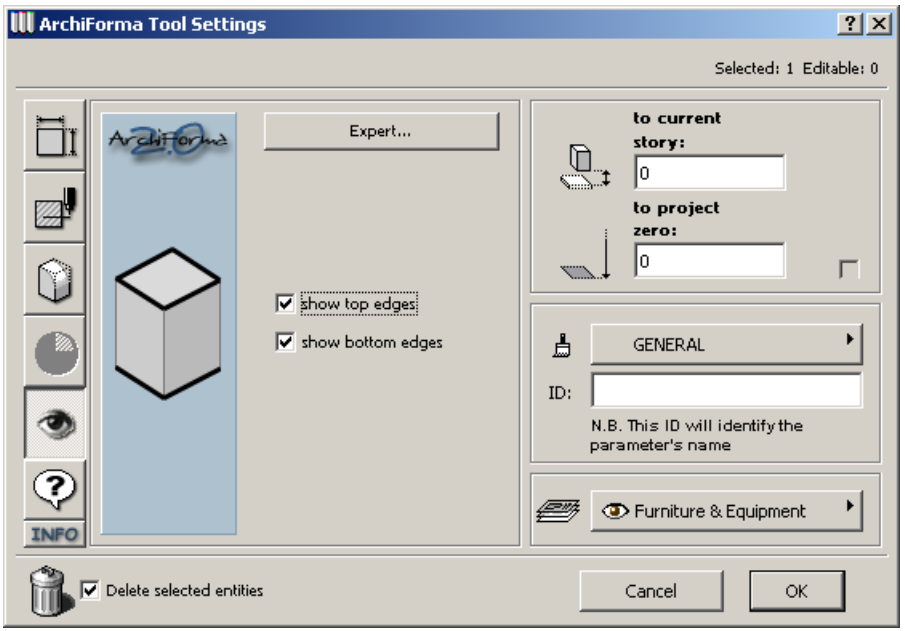


The section *The development box* is not available for this tool.



The Visualization Box

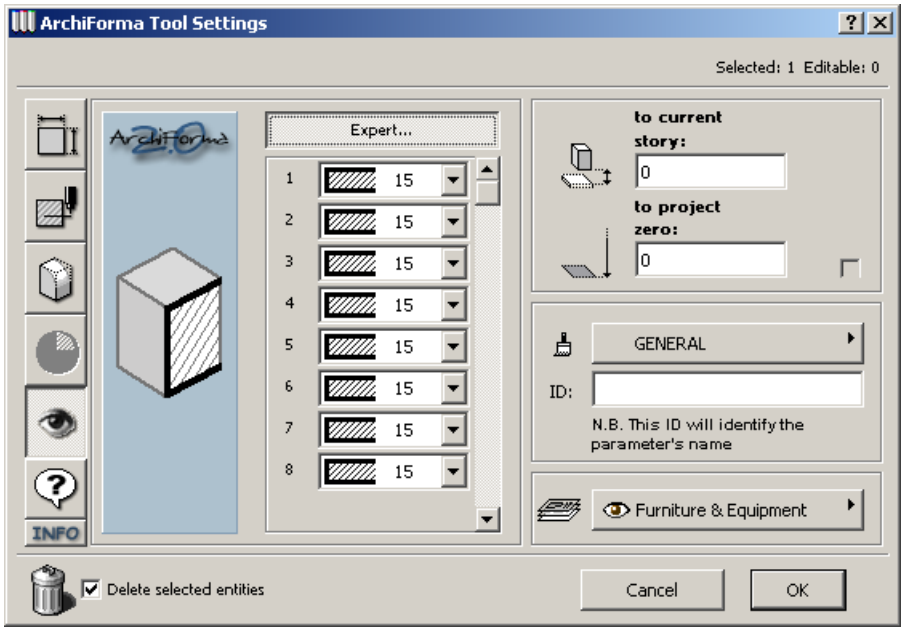
In this section, the two check-boxes allow you to display or not the base and the top edges.

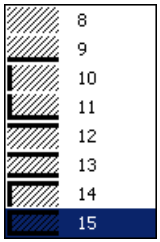


You can choose to use this simplified setting (using the two described check-boxes) or chose to click on the Expert button, positioned on the upper part of the box, to access the right customization of each edge of the shape.

In the Expert dialog box, it's possible to define, for each side element surface (holes included), the mask values used to show or hide the specified edges.

Thick lines indicates the visible edges.





As previously suggested, please refer to the GDL manual enclosed to the ArchiCAD software box, to get more detailed information on the meaning of these values (called "*mask values*").

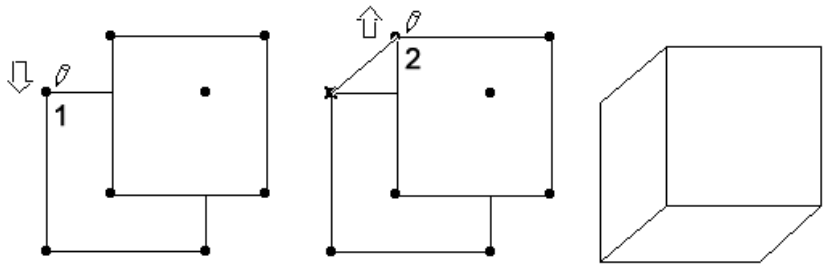
The Ruled Extrusion

The second type of extrusion creates an element whose shape is generated by the merging of 2 two-dimensional shapes: one acts as the base and the other as the top. To finally get a perfect and linear shape, it's better to use fills with equal number of sides as two-dimensional elements. In case this is not possible, you can try the following expedience. Select the fill with the lowest number of sides as possible and, inside its perimeter, create as many nodes as those corresponding to the difference between the two elements, keeping unchanged their shape.

It's not possible to drill this type of element by drilling the fills that you used to generate it (even if the element can contain the fills, ArchiForma won't consider them), but you can only use the hole tool described later on in this manual.

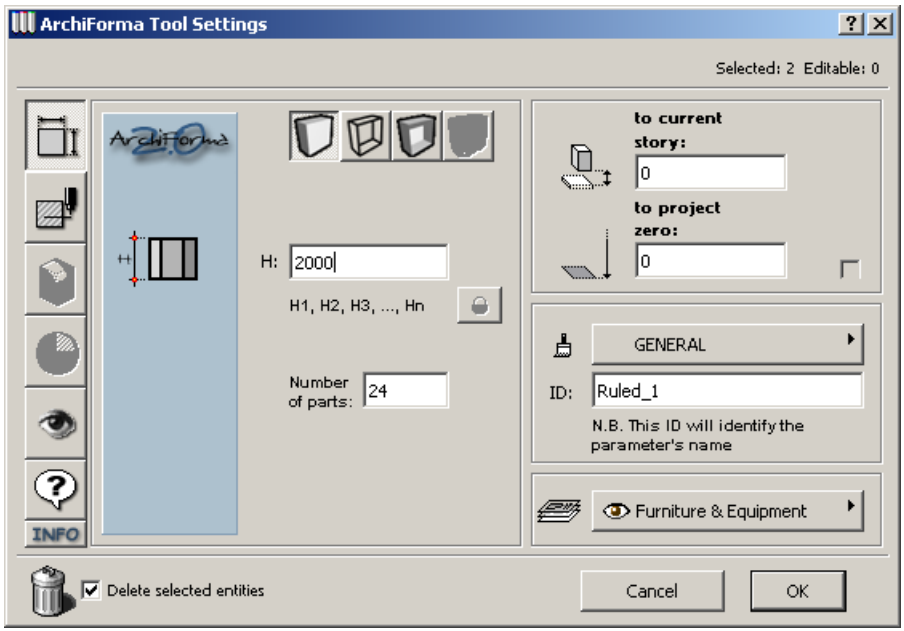
To create a "Ruled" element, please select both profiles and click on the tool icon. The cursor turns into a pencil next to an arrow downwards waiting for you to click on one node for choosing which of the profiles acts as a base and from where starts the connection to the surface acting as a top.

With the second click, the arrow points upwards waiting for you to enter in ArchiForma the second node, which belongs to the upper profile lately connected to the node previously entered.



The Parameter Box

After your second click, the setting dialog window comes out on the screen.



After your second click, the setting dialog window comes out on the screen.

In the first numerical editing field identified by the “H” letter, enter the height of the element you need to extrude. Under this field, there is a disabled button with an icon portraying a lock.

This setting, which will be explained later on, is active only when you are editing a “ruled” element previously created.

There is another value to enter in the numerical field: the number of segments into which ArchiForma has to split the side surfaces of the model coming out from merging the two profiles.

This connection is performed by creating triangles. The higher the entered number is, the more precise and complex the created shape results (though heavier).

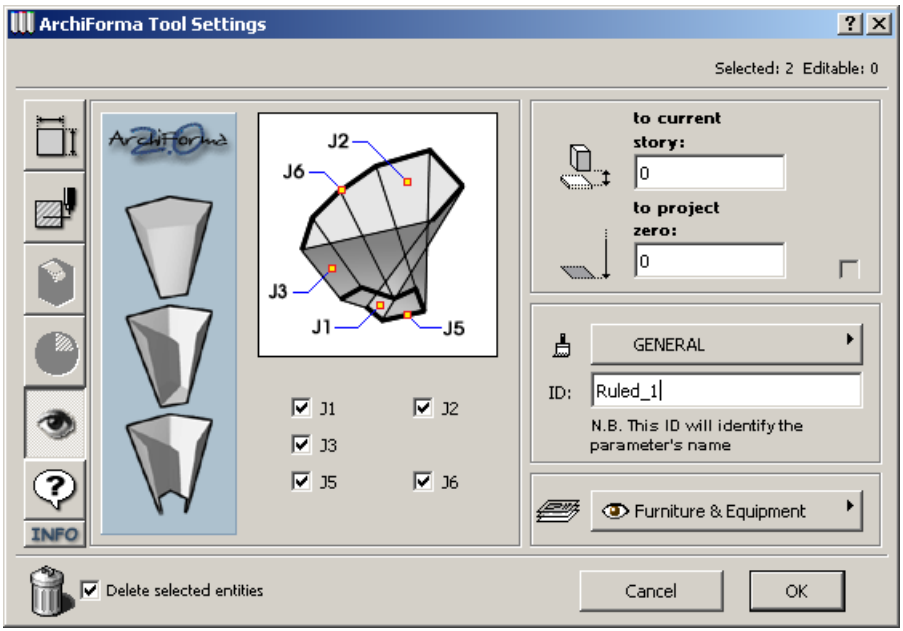
You can decide whether to keep or not the two-dimensional shapes which were the base of the extrusion by means of the corresponding check-box next to the trash icon.

Refer to the already described paragraph *The common commands in the dialog box of ArchiForma tools* for any setting concerning The attributes box.

The Rounding Box and *The Development Box* sections are not available for this tool.

The Visualization Box

In this section you can decide whether to display the top and the base edges, the sides and surfaces of the triangles by activating or not the check-boxes.



As previously suggested, please refer to the GDL manual enclosed to the ArchiCAD software box, to get more detailed information on the meaning of these values (called "mask values").

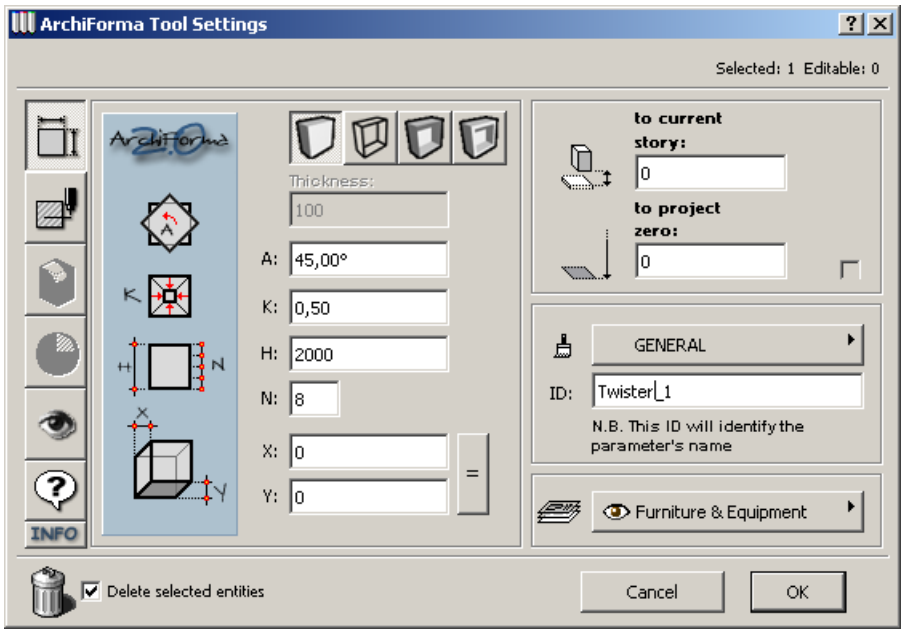
The Twister Extrusion

The third type of extrusion is the "Twister" identified by this icon.

As in all the extrusions previously considered, you need a basic profile that you can create using the fill tool. You can choose any of all the two-dimensional shapes but you cannot drill it (by the way even if the fill can contain the holes, ArchiForma won't consider them). The main principle of this type of extrusion is the rotation and the re-dimensioning of the basic profile along a specific height.

Select a fill and click on the Twister icon on the ArchiForma palette.

The Parameter Box



The first value you have to enter in the numerical field is the rotation angle "A" (expressed in degrees). The two-dimensional shape will rotate on itself of the same value. The second setting "K" is the re-dimensioning value, it can have only a positive value and it is proportioned to the original value. For example: if you want to obtain a shape which is the double of the base, you must enter 2, while to obtain the half of it, enter 0.5.

In the “H” field, key in the height of the extruded element (the vertical extrusion value), while in the field identified with the letter “N” , key in the number of parts into which you need to split the vertical extrusion path. This value can change from a minimum of 3 parts to a maximum of 255 .

The higher this value is, the more fluid the created form results, but the element created will be also heavier.

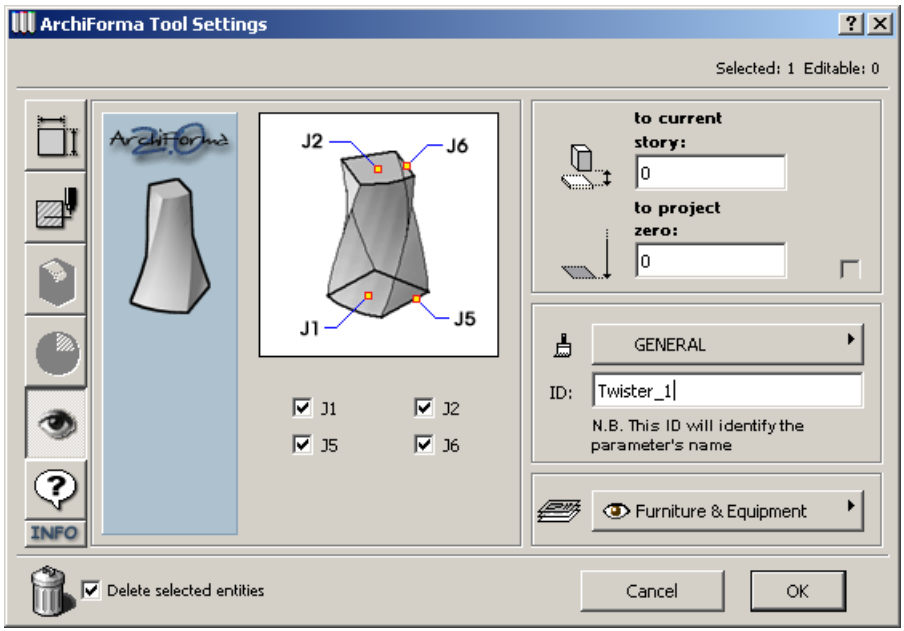
In the lower left side of the box, there is a trash icon. If you enable its check-box, ArchiForma will cancel the basic fill that you used to create the object. If this check-box is disabled, the fill will remain positioned on the plan for a future use.

Refer to the already described paragraph *The common commands in the dialog box of ArchiForma tools* for all the settings concerning The attributes box.

The sections *Rounding Box* and the *Development Box* are not available for this tool.

The Visualization Box

In this section you can decide whether to display the top and base edges and their surfaces, by enabling or not the check-box.



As previously suggested, please refer to the GDL manual enclosed to the ArchiCAD software box, to get more detailed information on the meaning of these values (called "*mask values*").

The Bend Extrusion

The last type of extrusion is the “Bend” extrusion.

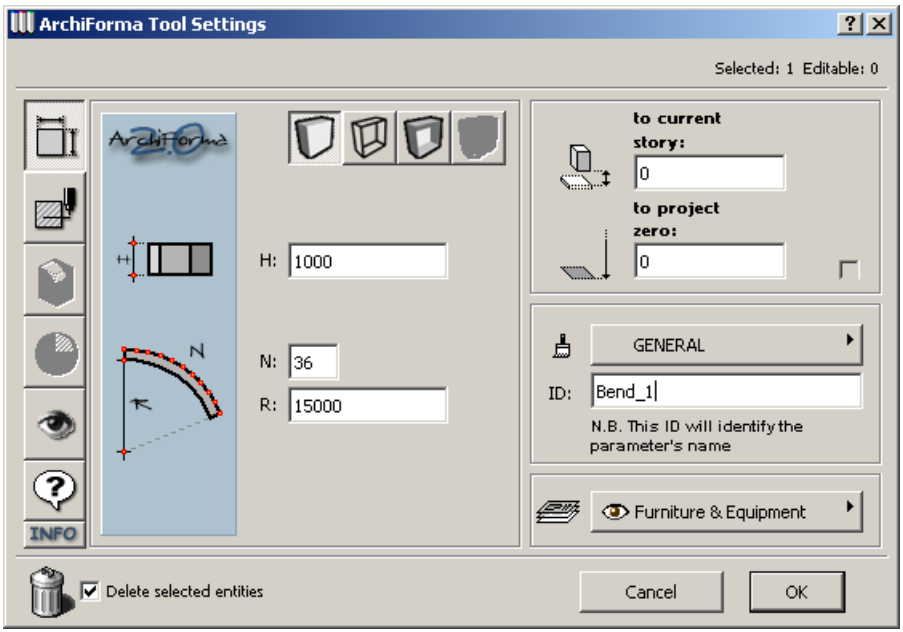
This command is very similar to the simple vertical extrusion above described but with one difference: the final body obtained can be bent.

Similarly to the extrusions previously described, you need to start from a basic profile that you can create using the fill tool.

One of the features of this tool is the possibility to immediately create (With one of the features of this tool you can obtain) holed elements simply by drilling the fill you used as a base, following the standard ArchiCAD technique.

Select then the fill you created and click on the icon of Bend extrusion.

The Parameter Box



Enter the height of the extruded element in the “H” field (the vertical extrusion value). In the “N” field, enter the number of parts required by the resolution of the bent section. The value can range/ change from a minimum of 3 to a maximum of 255 parts.

The higher the number entered is, the more rounded the shape created results (but the created element will be heavier).

In the "R" field you can set the value of the bending radius of the element.

This tool does not provide deformation settings.

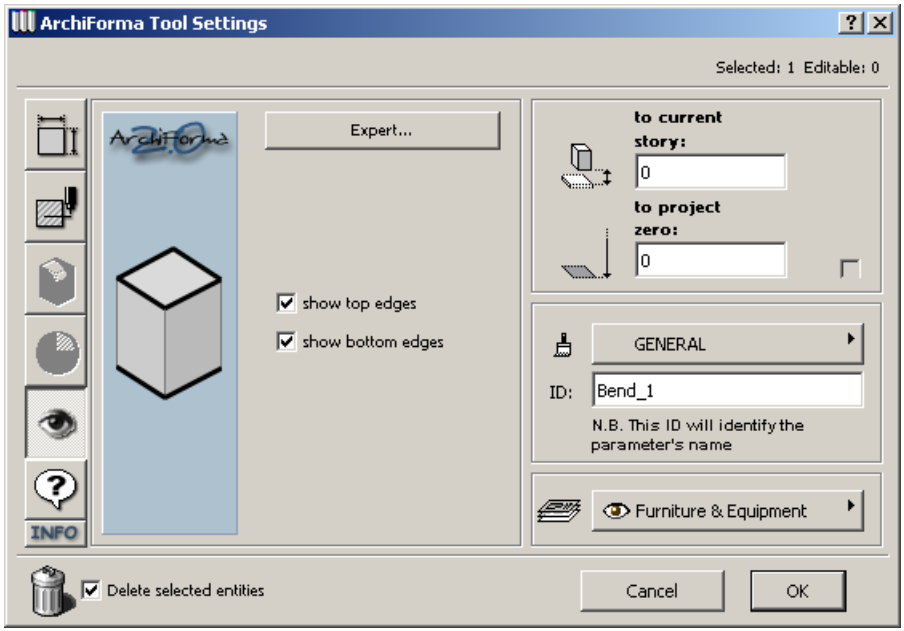
You can decide whether to hold or not the two-dimensional shapes which were the base of the extrusion by enabling the corresponding check-box next to the trash icon.

Refer to the previous paragraph *The common commands in the dialog window of ArchiForma tools*, for any setting concerning *The attributes box*.

The sections the *Rounding box* and the *Development box* are not available for this tool.

The Visualization Box

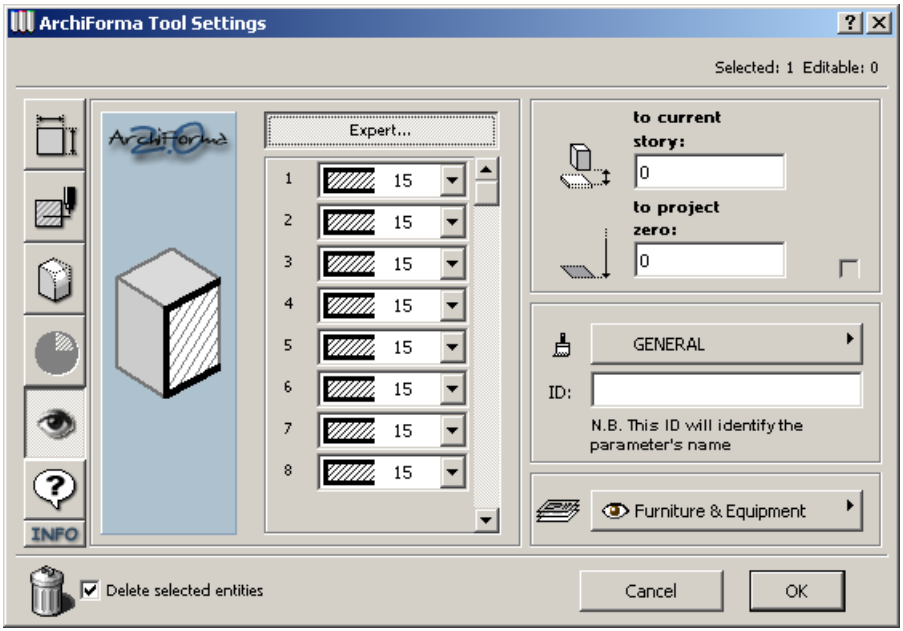
You can use the two check-boxes available in this section to display or not the edges of both base and top (just like previously described in the simple extrusion).

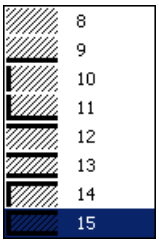


You can decide to use this simplified setting (using the two check-boxes above described) or to click on the Expert button, positioned in the upper part of the box, to access the precise customization of each edge of the shape.

In the Expert dialog box, it's possible to define, for each side element surface (holes included), the mask values used to show or hide the specified edges.

Thick lines indicates the visible edges.





As previously suggested, please refer to the GDL manual enclosed to the ArchiCAD software package, to get more detailed information on the meaning of these values (called "mask values").

Revolution and Spiral

These two tools can be used to create revolution surfaces and/or solids as well as spirals of any section.

Revolution

The first to be displayed on the Palette is the Revolution.

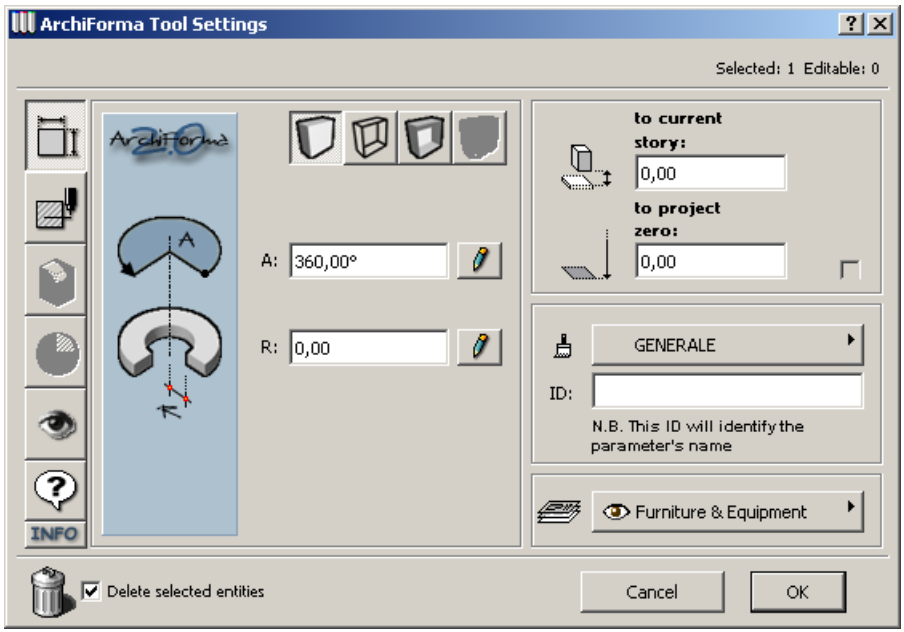
Start by drawing on the plan the profile that will be used to create the revolution surface/solid with the Fill tool or the ArchiCAD Polyline tool.

If you use the Fill tool, remember that you cannot assign holes, which will be neglected anyhow.

Select the profile and click on the Revolution icon.

The Parameter Box

In the "A" field , key in the revolution angle you used to generate the final shape, while in the "R" field enter the value, if any, of the inside radius. This will be the shifting of the profile from the revolution axis. Both values can be defined also graphically but only in the Plan window.



In the "A" field , key in the revolution angle you used to generate the final shape, while in the "R" field enter the value, if any, of the inside radius.

This will be the shifting of the profile from the revolution axis. Both values can be defined also graphically but only in the Plan window.

No deformation settings are available for this tool.

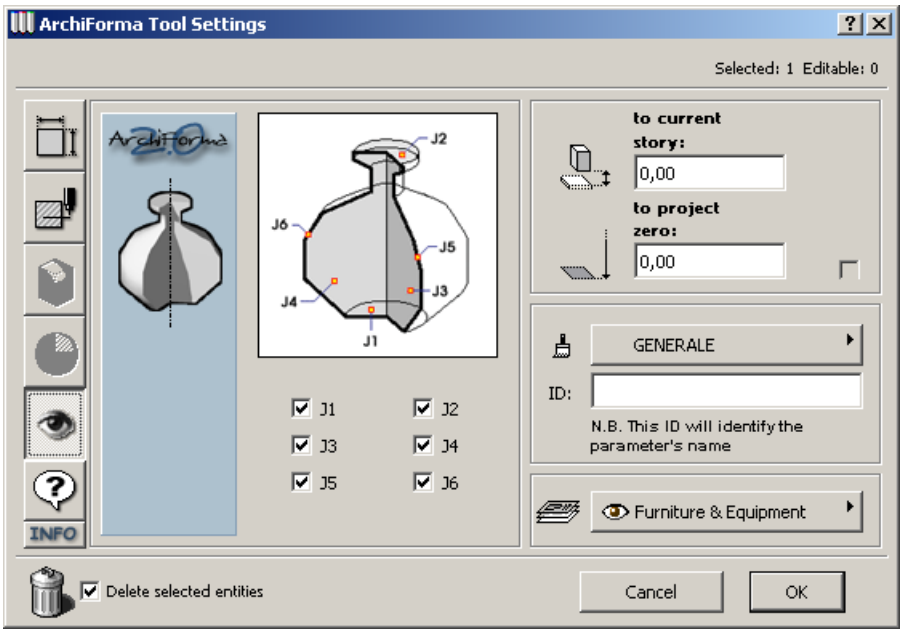
In the lower left side of the box, there is an icon portraying a trash. If you enable the corresponding check-box, ArchiForma will cancel the profile you used to create the object. If disabled, the profile will remain positioned on the plan and ready for a future use.

Refer to the previous paragraph *The common commands in the dialog window of ArchiForma tools*, for any setting concerning *The attributes box*.

The sections *The rounding box* and the *Development box* are not available for this tool.

The visualization box

The various/ several check-boxes that you can find in this section, let you choose whether to display or not the edges and surfaces of your final object.



As previously suggested, please refer to the GDL manual enclosed to the ArchiCAD software package, to get more detailed information on the meaning of these values (called "mask values").

Spiral

After the Revolution tool, the Spiral is the second tool available on the Palette.

With this tool you can generate spirals as well as simple tori.

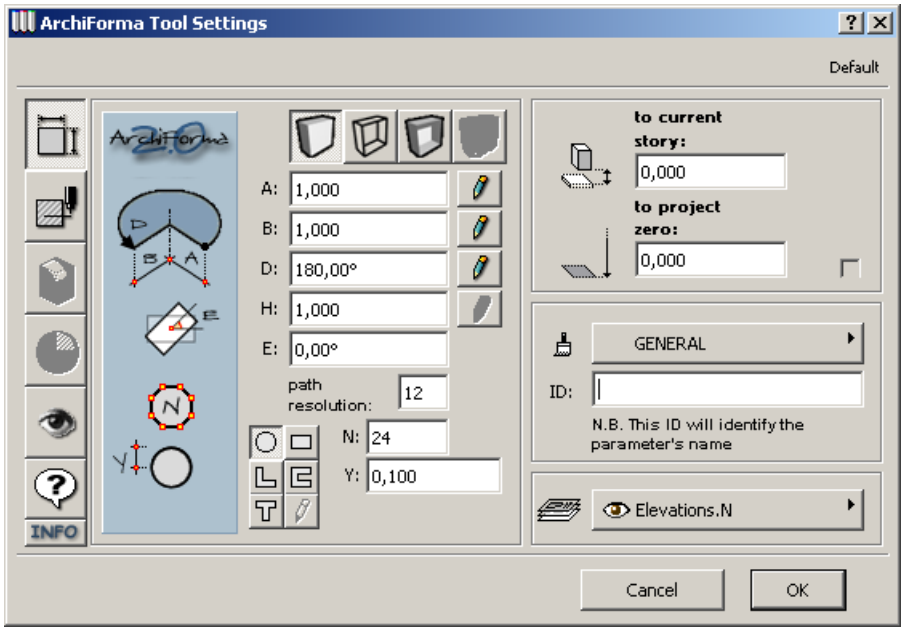
Likewise the Pyramid tool, the Spiral tool can be used in two different modes to allow the user to generate spirals with pre-defined or customized sections.

Let's start with the standard method for regular-section spirals.

The Parameter Box

Click on the Spiral tool icon.

The first five editable fields are common to all spirals you can create with ArchiForma.



In the field "A" you need to enter the value of the horizontal radius of the spiral, while in the field "B" the vertical radius (spirals can be also elliptical, as well as circular). With the two pencils next to these two fields, you can enable the graphic mode to define them in both Plan and 3D window.

The “D” field represents the developing angle of you spiral. An important feature of the developing angle refers to its numerical definition: this value can be higher than 360°, (it means that the spiral can go on wrapping around itself), but in the graphic definition mode, this value cannot exceed 360° due to the Plan and 3D window current limitations.

In “H” field identifies the vertical spiral development, that’s to say the vertical shift along the developing angle (do not misunderstand this with the height of the final object). Obviously, if this value is set on zero, you will generate tori.

As for all the other tools already described, the “H” value can be defined graphically (by clicking on the pencil icon) only if you are generating the spiral in the 3D window.

The “E” field allows you to define the rotation of the spiral section around its axis.

The “Resolution” field defines the number of segments into which ArchiForma splits the bent parts of the spiral path.

Below the above described fields, there are six little buttons that you can use to choose among the available sections. They are:

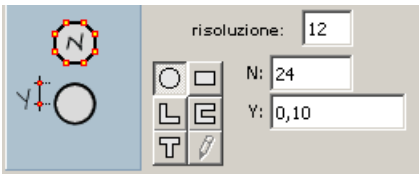
- Circular section
- Rectangular section
- L-shaped section
- C-shaped section
- T-shaped section
- Custom section

The last option the custom section, is available/enabled only if you are generating a customized section spiral (and you have drawn and selected a fill before accessing this tool).

According to the selected option, below these six buttons, you will see the fields that allow you to define the geometry of the section.

Let’s look at them according to your selection.

Circular section



In the numerical input field identified by the letter "N", you need to enter the number of partitions into which you need to split the circle. This value can change from a minimum of 3 to a maximum of 255 partitions. The higher this value is, the more precise the resolution of the curve results, but the element you create will be heavier.

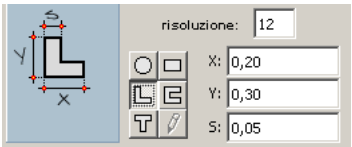
The "Y" field corresponds to the dimension of the radius of the circular section.

Rectangular section

In the numerical input field identified by the letter "X", you need to enter the length of the base of the rectangle and in the "Y" field the value of the height of the rectangle.

Obviously, if you set the same value in both fields, your final section will be a square one.

L-shaped section



In the numerical input field identified by the letter "X", you need to set the width of your L-shaped section and its height in the "Y" field.

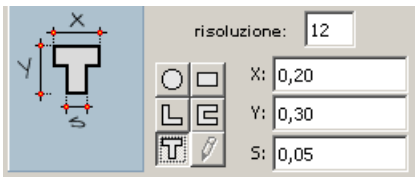
In the "S" field, you can define the thickness of the elements building the section.

C-shaped section

In the numerical input field identified by the letter "X", you need to set the width of your C-shaped section and its height in field "Y" field.

In the "S" field you can set the thickness of the elements building the section.

T-shaped section



In the numerical input field identified by the letter "X", you need to set the width of your T-shaped section and its height in field "Y" field.

The "S" field allows you to set the thickness of the elements building the section.

Custom section

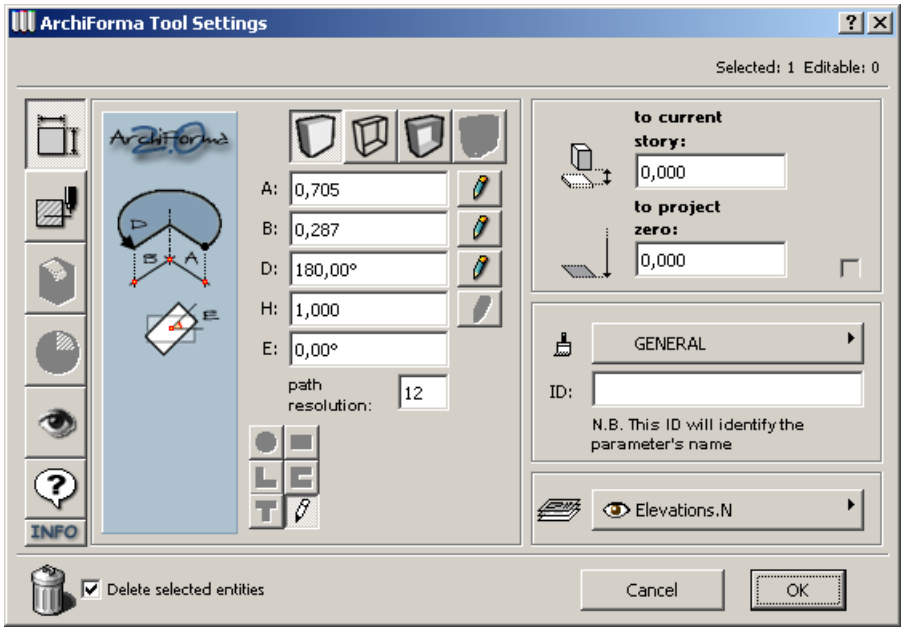
With this generation method for spiral/torus, you can create elements with customized section.

With the ArchiCAD fill tool, draw any kind of shape. Select it and click on the Spiral tool icon.

Ensure that the fill you used does not contain holes; nevertheless if it does, ArchiForma will not consider them.

Once clicked, ArchiForma displays the parameters setting box.

As you can see in the figure below, the buttons for selecting the available sections are disabled.



Only the icon with the pencil is active to remind you that you are generating a spiral with a customized section as well as the resolution field for the curved parts of the path.

No special settings are required in this section, since all the necessary data are obtained from the selected fill.

In the left lower part of the box, you can see a trash icon. If you enable its check-box, ArchiForma will delete the fill you used to create the object. If disabled, the fill will maintain its position on the Plan for future uses.

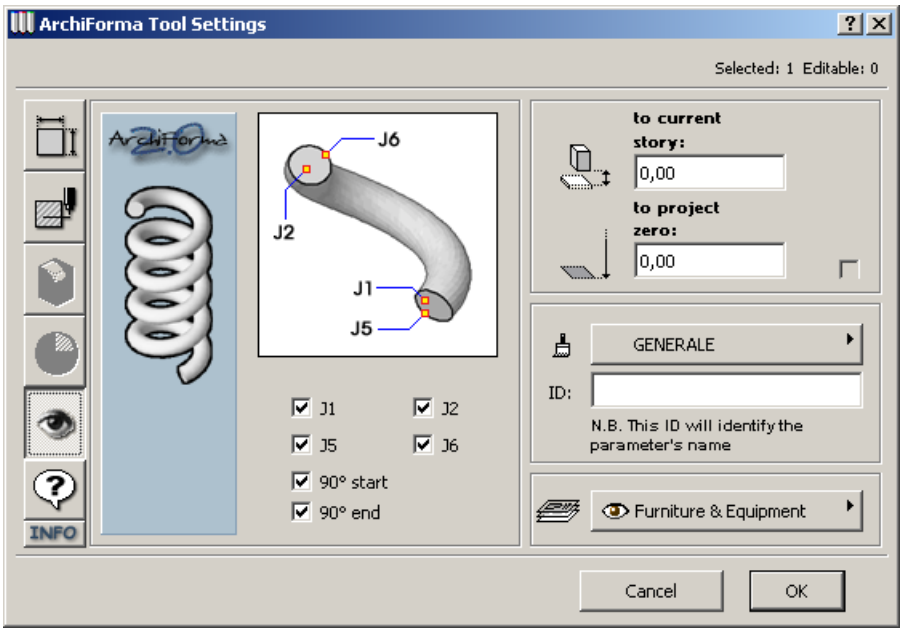
No deformation settings are requested for the Spiral tool.

Refer to the previous paragraph, *The common commands in the dialog window of ArchiForma tools* for any setting concerning *The attributes box*.

The sections *The rounding box* and the *Development box* are not available for this tool.

The Visualization Box

In this section you can have several check-boxes that you can use to display or not the edges and the surfaces of the resulting object.



As previously suggested, please refer to the GDL manual enclosed to the ArchiCAD software package , to get more detailed information on the meaning of these values (called " mask values").

With the last two check-boxes , you can define the appearance of the two ends of the spiral: if enabled, the two end heads will be vertical as regards the horizontal plane of the spiral.

Extrusions along paths

This two tools group allows you to create shapes from extruding a profile along a three-dimensional path.

Simple extrusion along a path (Tube)

The first function displayed on the palette is the simple extrusion along a path (Tube).

This kind of shape needs that you define two components: a profile and a path (along which the profile will be extruded).

The profile and the path must be defined on the plane and than selected before you click on the tool "Simple Extrusion along the path".

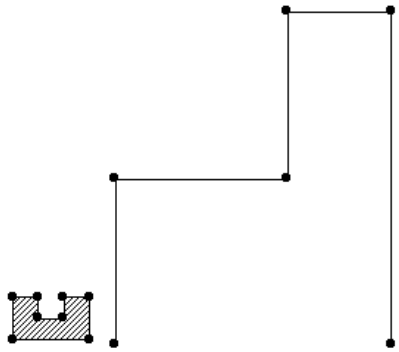
The profile to be extruded may be of any shape. You can generate it by using:

- An ArchiCAD fill (with no holes and if any are present, ArchiForma will not consider them). In this case, your final result will be a closed section.
- An ArchiCAD polyline. In this case, the result will be an open section or a close section according to the geometry of the polyline you drawn.

The path, along which you may extrude the profile, must be generated by using:

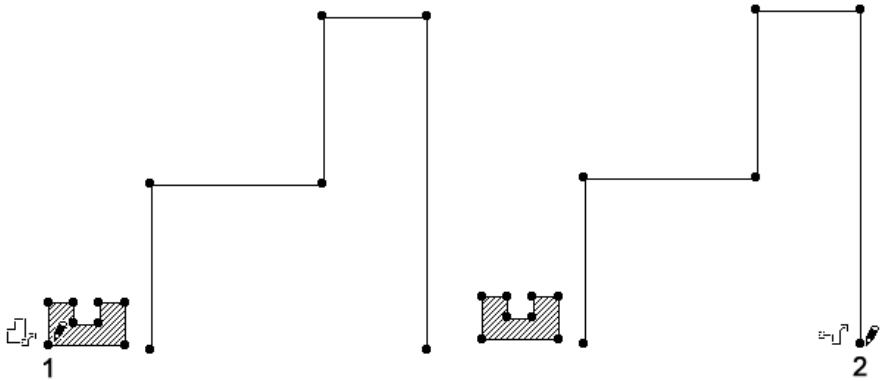
- An ArchiCAD fill (with no holes and if any are present, ArchiForma will not consider them). In this case, your final result will be a closed path in which all the nodes of the path will have the same level (Z = 0). Their individual level can be then modified/assigned once the element had been generated.
- An ArchiCAD polyline (formed at least by three nodes). In this case, the result will be an open path or a close path according to the geometry of the polyline you drawn , in which all the nodes of the path will have the same level (Z=0). Their individual level can be modified/assigned once the element had been generated.
- An ArchiForma 3D polyline. In this case, the coordinates of the path are obtained from the polyline nodes. For this reason, the path may take any direction along the Z-axis and may be closed or open.

To generate a simple Extrusion along a path, select the two elements that identify the profile and the path, and click on the Simple Extrusion tool along a path.



The cursor turns into a pencil next to the icon of a closed profile, asking you to define with a click the point of the profile which will "run" along the path. This node can be one of the vertexes of the profile or a -common- point of any kind (even out of the node area) if you need the profile to be generated offset to the section.

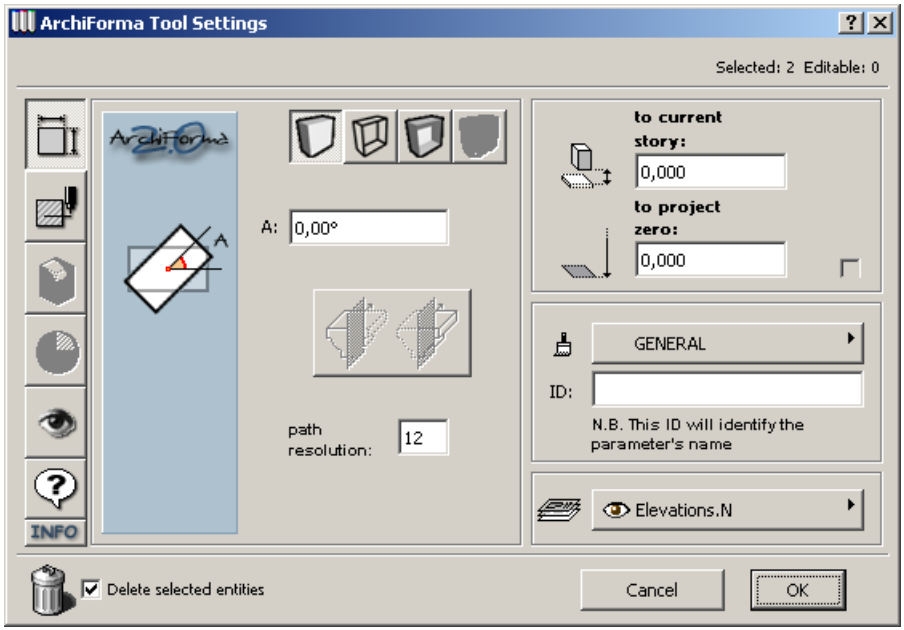
As soon as you define this node, the cursor changes its shape again, turning into an open path icon, and asking you to click on any node of the path in order to determine, between the two selected shapes, which one represents the spatial path used to extrude the profile.



At your click, ArchiForma displays the parameters setting box.

The Parameters Box

The first editable field of the parameters box for the Simple Extrusion along a path, is the field marked with the letter "A" that indicates the possible rotation angle of the profile along the horizontal axis.



Below the field "A", with a special button (disabled when creating the object, but enabled when you are modifying a selected object), you can reflect the section along the path axis.

After this field, there is the "Resolution" field, where you can set the number of segments into which you will split the curved parts of the path.

In the lower left side of the box , there is an icon with a trash. If you enable the corresponding check-box, ArchiForma will delete the profile you used to create the object. If disabled, the profile will remain positioned on the plan and ready for a future use.

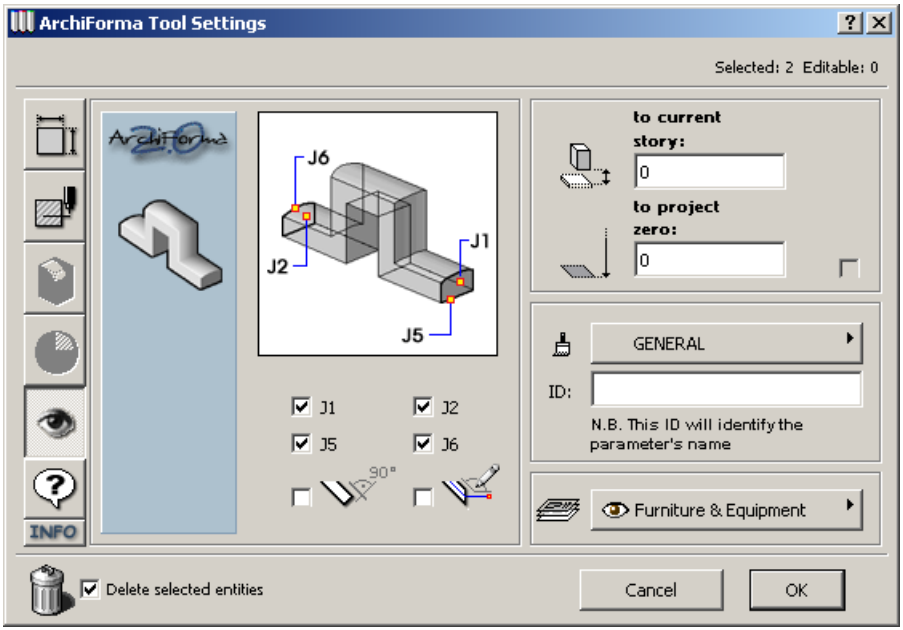
There are no deformation settings available for the Simple extrusion tool along a path.

Refer to the previous paragraph *The common commands in the dialog window of ArchiForma tools* for any setting concerning *The attribute boxes*.

The sections *The rounding box* and the *Development box* are not available for this tool.

The visualization box

With the first four check-boxes available in this section, you can decide whether to display or not the edges and the boundary surfaces of the resulting object.



As previously suggested, please refer to the GDL manual enclosed to the ArchiCAD software package, to get more detailed information on the meaning of these values (called " mask values").

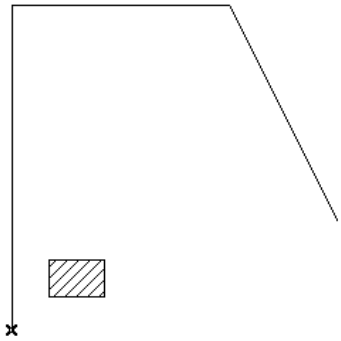
The last two check-boxes can be used to control the sense of direction of the two ends of the objects:

If you enable the first check-box on the left (the second is automatically disabled), the ends of the element will be at 90° respect to the path direction.

By disabling the first check-box, you can choose the sense of direction of the two ends as you like, using the two appropriate "handles" displayed each time you enable the second check-box on the right.

Let's see this better with some but easy examples.

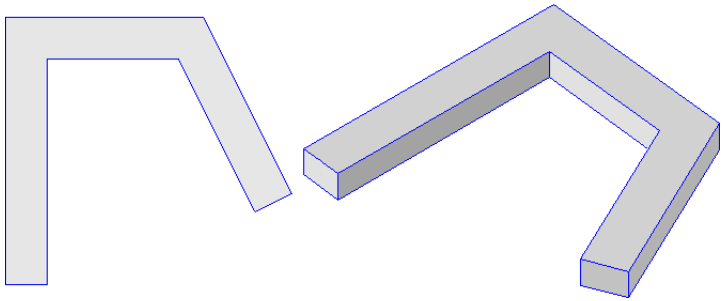
- Draw in the plane a rectangular fill (your profile) ad a polyline (your path).



- Now, select them and click on the tool "Simple Extrusion along a path".
- Click on a node of the fill and then on a node of the path to identify the two elements.

In the displayed settings box, don't change anything, but accept the values given as standard which, concerning the Visualization box, assign the value of 90° to the ends of your simple extrusion along a path.

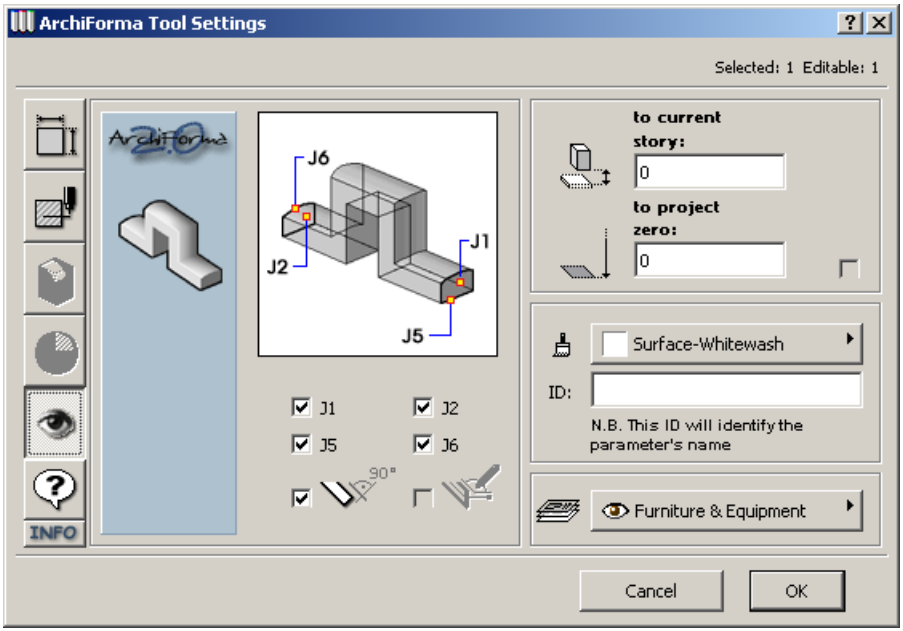
- Confirm the settings and that's your final object.



You can clearly see that the sides of the object ends are at 90°.

Let's assume now that you intend to "customize" this sense of direction.

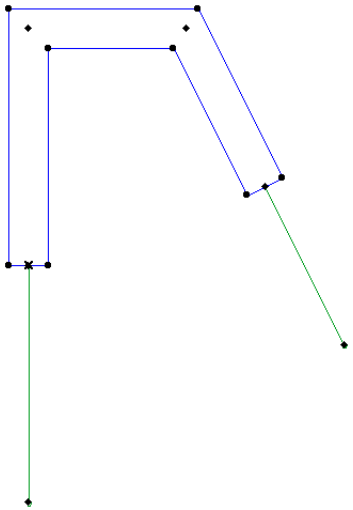
- Select the object and click on the tool icon “Simple Extrusion along a path” to modify its settings. Open the Visualization box with a click on the appropriate button on the left.



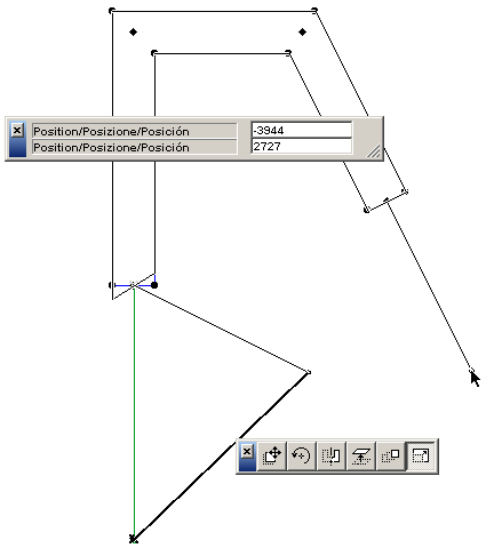
- Disable the check-box for the 90° orientation and enable the second check-box.

You are now customizing the orientation and requesting the displaying of the “handles”, in order to define graphically these orientations.

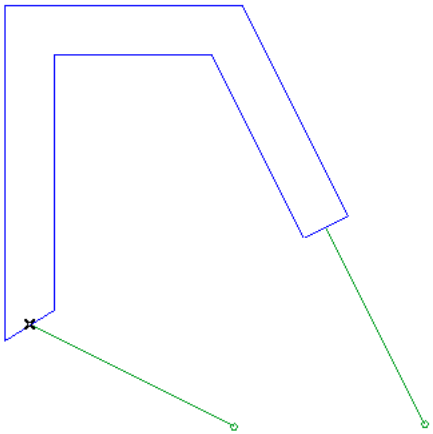
- Confirm the changes and here’s the final result on the plane.



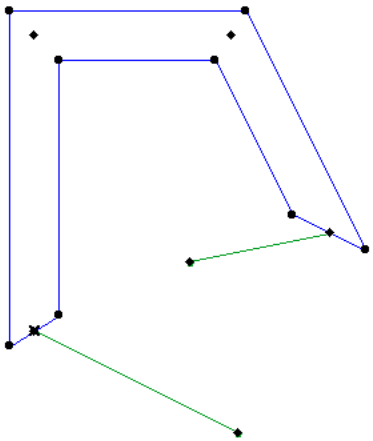
- By selecting the object, you can see two “editable hotspots” at the end of the two “handles”.
- Shift the cursor over one of the two hotspots and click keeping pressed the button of the mouse to display the pet palette , from which you will select the hotspot graphic editing option (ArchiCAD standard technique).
- Drag the node to the desired position. You should notice that the preview of the object displays in real time the future result you will obtain:



- Release the button of the mouse and ArchiCAD will display immediately the modified object.



- Repeat the same procedure also with the other node, shifting it as necessary, until you reach the required result.

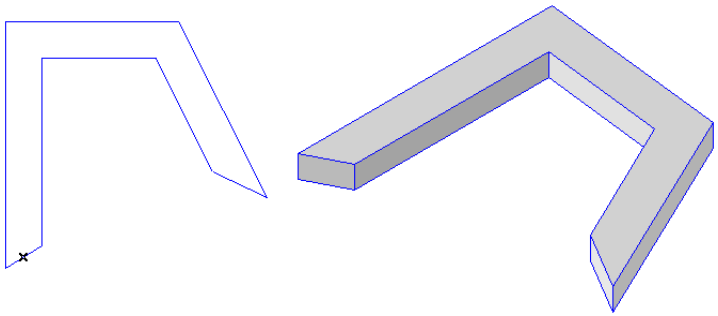


Now the two sides are oriented as you intended to.

- To "hide" the two handles (until you will need them again for any eventual future modification) select the object and click on the tool "Simple Extrusion along a path" to display the setting box. Click on the left button to access the Visualization box where you will disable the check-box to visualize the "handles":

Please Note *Do not enable once again the check-box for the 90° orientation unless you really want to return to this configuration*

- Confirm the modification and that's your final result:



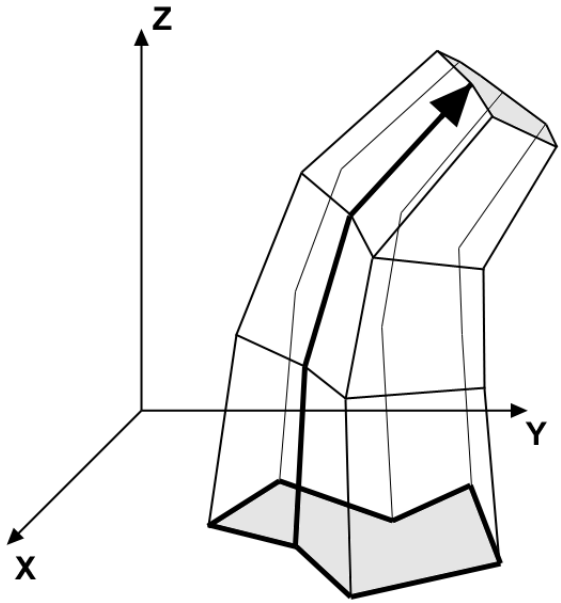
Scalar Extrusion along a path (Sweep)

After the tool “Simple Extrusion along a path”, the palette will display the Scalar Extrusion along a path (Sweep) tool.

With this tool, you will model complex shapes, such as the spout of a tea-pot.

With this tool, you will generate a surface from a profile that moves tracing a curved spatial path. This profile may be rotated and stepped in an incremental way on its plane.

The curved spatial path MUST necessarily develop along the Z-axis.



If you need to draw a shape like this, but with a different orientation, you should start by generating it according to the previous condition and then rotate it, as you need , using the ArchiForma Rotation tool (explained later on).

Although this tool is a simplification of the GDL Sweep command (to make it easier for you!) , please refer to the GDL manual enclosed to the ArchiCAD software package, to get more detailed information on the description of these kind of elements.

Likewise the Spiral tool, also the Scalar Extrusion along a path (Sweep) tool can be used in two different modes: users will be able to generate extrusions with a predefined or customized profile.

According to the type of profile that you need, with this kind of shape you are supposed to define one or two components:

1. A path only (in case the section has a pre-defined profile)

2. A profile (in case the section is customized) and a path.

The Profile and the path must be first defined on the plane and then selected, before you click on the Scalar Extrusion along a path (Sweep) tool.

The path, along which you will extrude the profile, must be generated by using a 3D ArchiForma Polyline. The coordinates of the path are drawn from the nodes of the polyline.

Suggestion: *analyzed the requirements that the 3D Polyline, representing the path, must have (it MUST necessarily develop along the Z-axsi), we suggest you to draw the 3D Polyline in a Section/Elevation box of ArchiCAD (for more and detailed instructions refer to the chapter 3D Polyline in this manual).*

The profile to be extruded (customized section) may be of any shape and must be generated by using an ArchiCAD fill without holes (if any are present, they will not be considered by ArchiForma).

Let's start with the standard method for regular section scalar Extrusions along a path (Sweep).

The parameters box

After drawing a congruent 3D ArchiForma Polyline (TO BE developed along the Z-axis), select it and click on the tool icon Scalar Extrusion along a path (Sweep).

The first two editable fields are common to all the scalar extrusions along a path that you may generate with ArchiForma.

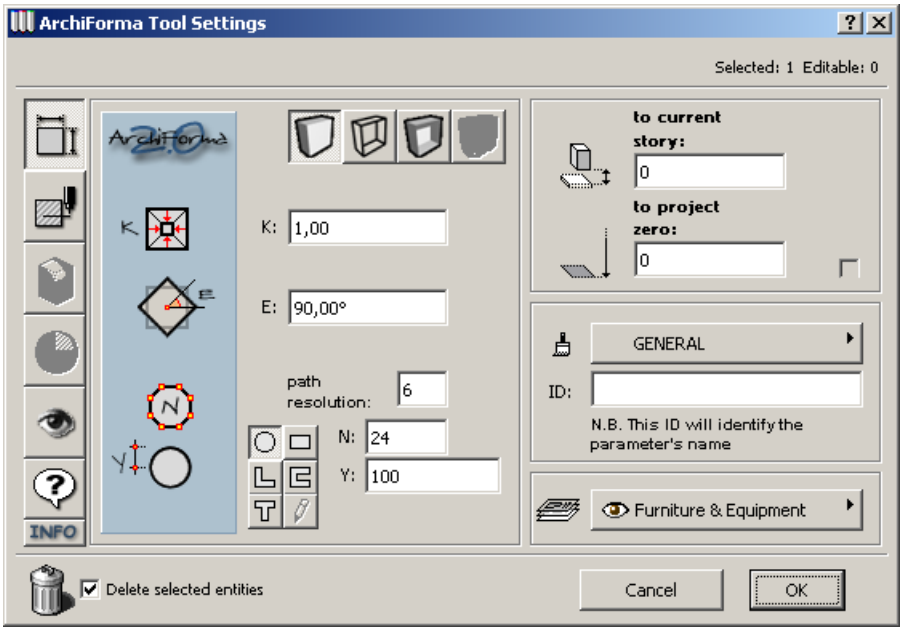
The "K" field is the input field of the resizing value; it can have only a positive value and is proportional to its original value. For example: to obtain a double-sized shape with reference to the base, you must enter 2, while if you want to obtain the half of it, you must enter 0.5.

Please Note *As previously mentioned, this value has a different meaning compared to that of the corresponding value of the GDL Sweep command. In the Sweep command the scale value represents "the incremental scale factor of the polyline, between two consecutive nodes of the path", but in this case, it represents the scale factor between the starting profile and the final profile.*

The "E" field is the rotation angle of the final profile respect to the starting one.

Please Note *This value too has a different meaning compared to that of the corresponding one of the GDL Sweep command. In the Sweep command, the value of the angle represents the "incremental rotation of the polyline over its own plane, from two consecutive nodes of the path", but in this case, it represents the rotation of the final profile as respect to the starting one.*

The numerical field "Resolution" corresponds to the number of segments into which the curved parts of the path are split.



Under the fields above described, there are six little buttons that allow you to select among the several available sections. They are:

- circular section

- rectangular section
- L-shaped section
- C-shaped section
- T-shaped section
- Custom section

The last option, the customization section , is enabled/available only if you are generating a Scalar Extrusion along a path (Sweep) with a customized section (this implies that you have drawn and selected a fill before accessing this tool).

Depending on the selected option, under these six buttons , the fields for setting the geometry of the section will be displayed.

In the lower left side of the box, there is an icon with a trash. If you enable the corresponding check-box, you will delete the 3D ArchiForma Polyline you used to define the path. If disabled, the check-box will keep the 3D Polyline on the Plan ready for future uses.

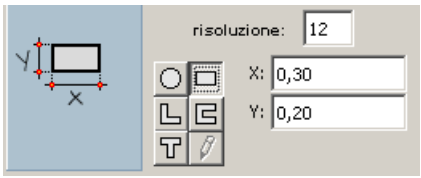
Here is an overview according to the choice you may make.

Circular section

In the numerical input field identified by the letter “N”, you need to enter the number of partitions into which you intend to split the circle. This value can change from a minimum of 3 to a maximum of 255 partitions. The higher this value is, the more precise the resolution of the curve results, but the element you create will be heavier.

The “Y” field corresponds to the dimension of the radius of the circular section.

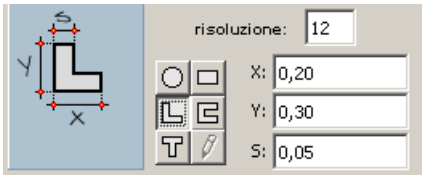
Rectangular section



In the numerical input field identified by the letter “X”, you need to enter the length of the rectangle base and in the “Y” field the value of the rectangle height.

Obviously, if you set the same value in both fields, your final section will be a square one.

L-shaped section



In the numerical input field identified by the letter “X”, set the width of your L-shaped section and its height in the “Y” field.

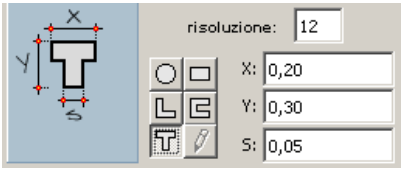
In the “S” field, you can define the thickness of the elements building the section.

C-shaped section

In the numerical input field identified by the letter “X”, set the width of your C-shaped section and its height in field “Y” field.

In the “S” field, you can define the thickness of the elements constituting the section.

T-shaped section



In the numerical input field identified by the letter "X", set the width of your T-shaped section and its height in field "Y" field.

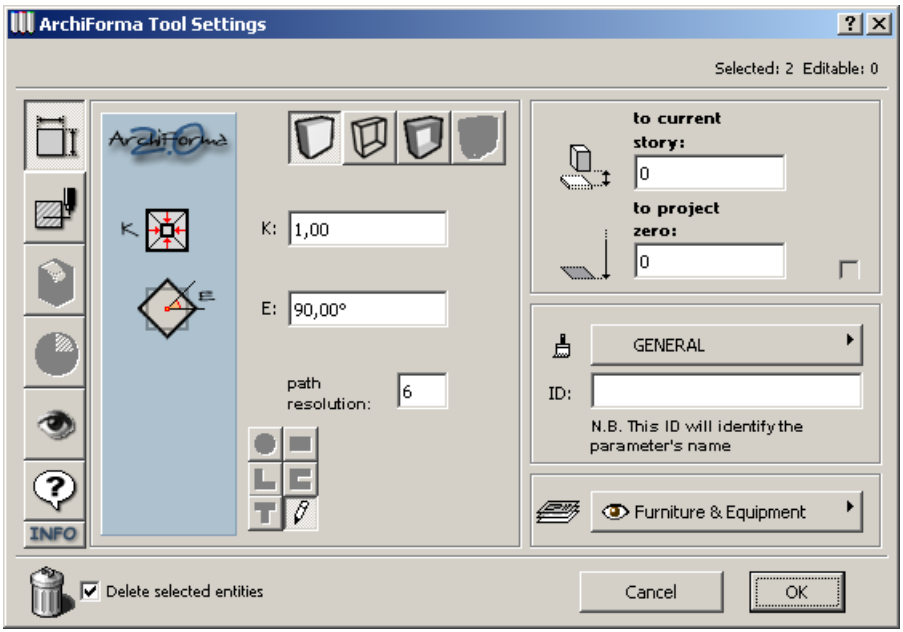
In the "S" field, you can set the thickness of the elements building the section.

Custom section

Another method to generate a Scalar Extrusion along a path (Sweep) allows you to generate elements with a customized section.

After drawing a fill (representing your customized section) and a congruent ArchiForma 3D Polyline representing the path (it MUST develop along the Z-axis), select both of them and click on the tool icon Scalar Extrusion along a path (Sweep).

At your click, ArchiForma will display the parameters setting box.



In this case, in the row of buttons for the selection of the section, the only enabled button is the one accompanied by a pencil which reminds you that your are generating a Scalar Extrusion along a path (Sweep) with customized section.

No special settings are required for this section since all the required data are obtained from the selected fill.

In the lower left side of the box, there is an icon portraying a trash. If you enable the corresponding check-box, ArchiForma will delete the 3D ArchiForma Polyline you used to define the path. If disabled, the check-box will keep the 3D Polyline on the Plan ready for a future use.

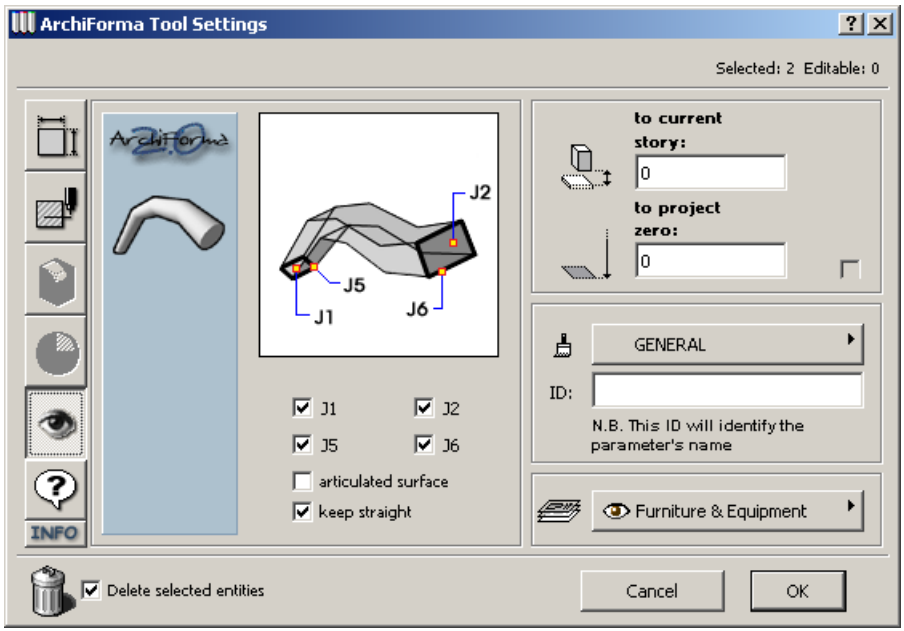
Deformation settings are not available for the tool Scalar Extrusion along a path (Sweep).

Refer to the previous paragraph *The common commands in the dialog window of ArchiForma tools* for any setting concerning The attributes.

The sections *The rounding box* and the *Development box* are not available for this tool.

The visualization box

In this section there are several check-boxes allowing you to display or not the edges and the surfaces of the final object.



As previously suggested, please refer to the GDL manual enclosed to the ArchiCAD software package, to get more detailed information on the meaning of these values (called "mask values").

In the last two check-boxes, you can define two special features of the created element:

- The articulated surface;
- The hold upright feature.

Articulated surface

By enabling the "Articulated surface" check-box the section edges are displayed.

In some cases, according to the morphology of the created element, enabling this option you will get more defined surfaces in the ArchiCAD Photo-Rendering.

Hold upright

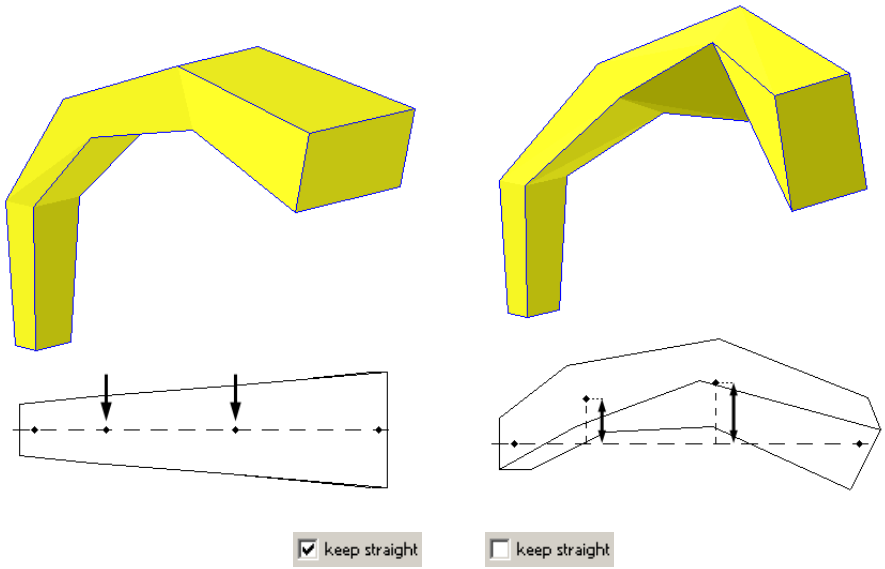
By enabling the check-box "Hold upright", you will bind the position of the path nodes to the X-Y plane (the nodes are the result of the 3D Polyline selected as spatial path) keeping the alignment along the line joining the starting and the final point.

In this way, your final shape will be always "correct" (or better, not deformed).

By disabling the option "Hold upright" no forcing will take place in the nodes positioning on the path and you may model the shape as you like.

Because of the complexity of this kind of element (by the way, coming from the corresponding GDL command called Sweep), this option could give you some troubles in terms of representation, or at least "odds", that will require further "adjustments" until you obtain the desired shape.

The two following examples explain how these modes are working:



The Surfaces

With ArchiForma you can choose among three different ways of creating extrusion surfaces.

These kinds of elements are generated by merging the ArchiForma 3D Polylines previously positioned on the Plan.

For a detailed description of how to create and use the ArchiForma 3D Polylines , refer to the corresponding following described chapter.

As we've just mentioned, these shapes come from the merging of the 3D Polylines already created by the user, so that their resulting geometry does not require any further setting.

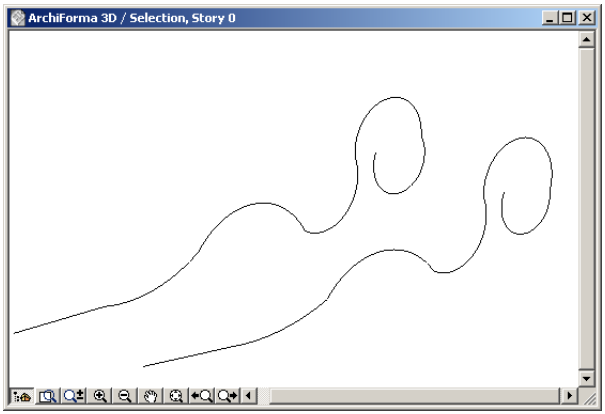
For this reason, in the settings box , all the surface generation tools are not provided with a parameter section.

The Ruled surface

The first surface displayed by the palette is the Ruled surface.

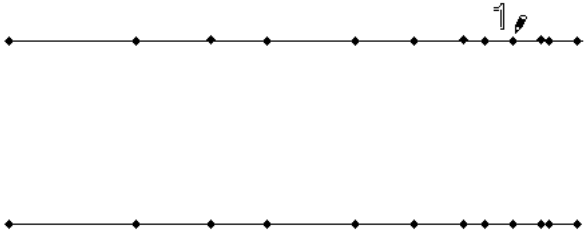
Let's start by drawing on the Plan the two profiles you want to merge in order to generate the final surface, by using the ArchiForma 3D Polyline tool (see the proper description later on).

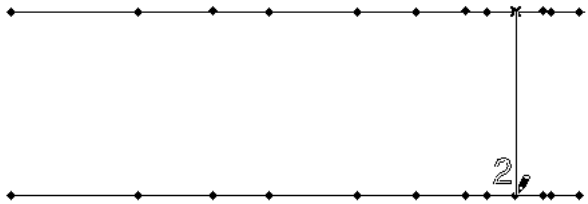
IMPORTANT: *For a proper functioning, the two 3D Polylines must have the same number of elements (two arcs > an arc and a line > two lines). If not, ArchiForma will display an error message.*



Select then the two ArchiForma 3D Polylines and click on the Ruled surface icon.

The cursor turns into a pencil sided by the number "1" symbol in order to identify the first click on the first curve node and by the number "2" symbol for the second click on the second curve node.

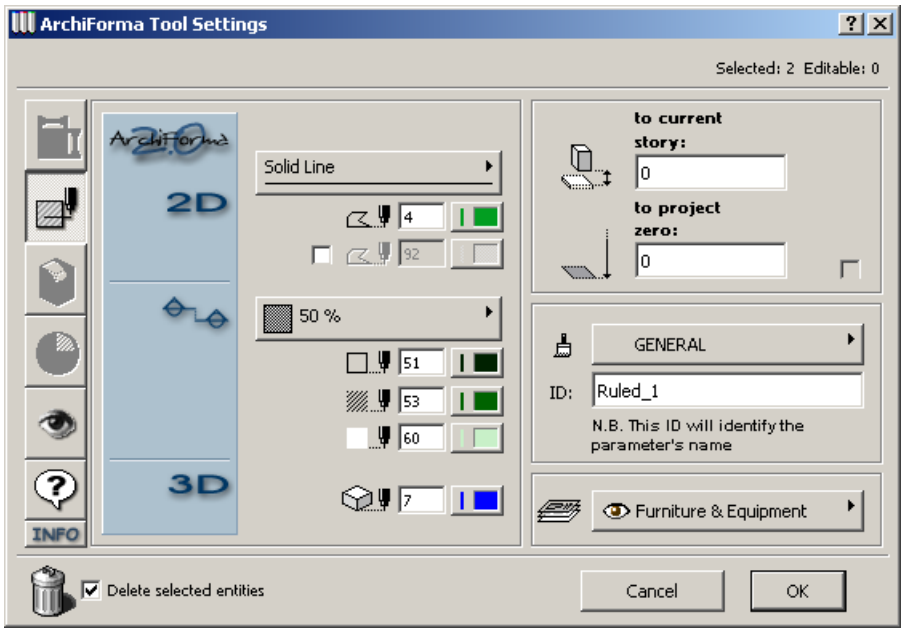




After making those two clicks, Once you have clicked twice the box for the configuration of the Ruled surface parameters will be displayed. In it, you can look over the attributes section (as already said, the parameters dialog is not required for these tools).

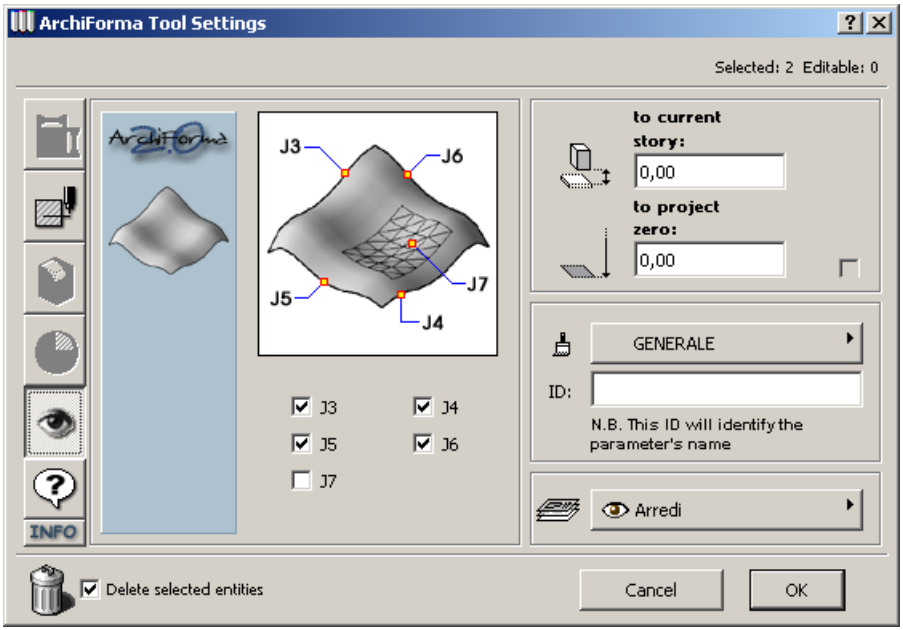
In the lower left part of the dialog, there is the icon with a trash. If you enable the corresponding check-box, ArchiForma will delete the two 3D Polylines used to create the object. If disabled, the two 3D Polylines will remain positioned on the Plan for future re-uses.

Refer to the previous paragraph *The common commands in the dialog window of ArchiForma tools* for any setting concerning *The attributes dialog*.

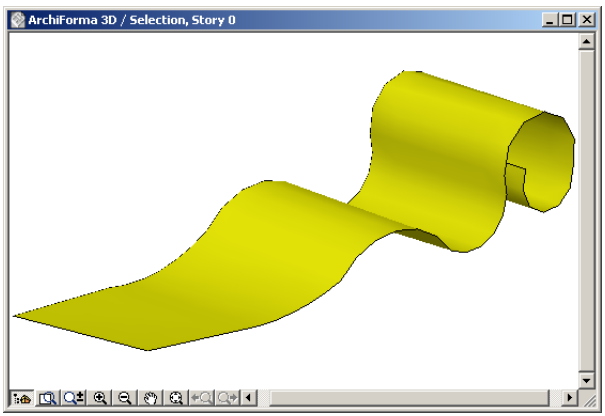


The Visualization Box

With the several check-boxes displayed in this section, you can decide whether to display or not the four edges of the final object as well as the mesh of its surface.



As previously suggested, please refer to the GDL manual enclosed to the ArchiCAD software box , in order to get more detailed information on the meaning of these values (called "mask values").

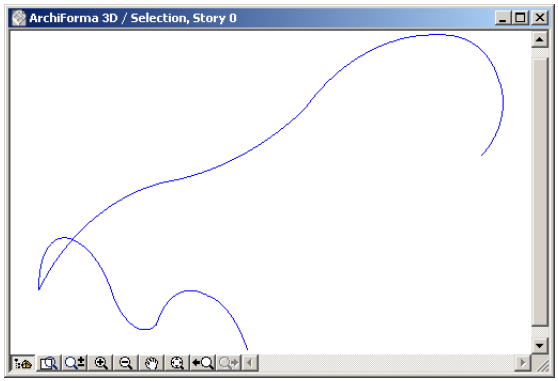


The Translational surface

The second surface on the palette is the translational surface.

Let's start by drawing on the Plan the two profiles necessary to create the surface using the ArchiForma 3D Polyline tool (see the proper description later on): one profile will be extruded along the path defined by one of the two.

Please Note *The two profiles must necessarily have one end in common in order to generate the final surface.*



Select then the two ArchiForma 3D Polylines and click on the icon of the translational surface.

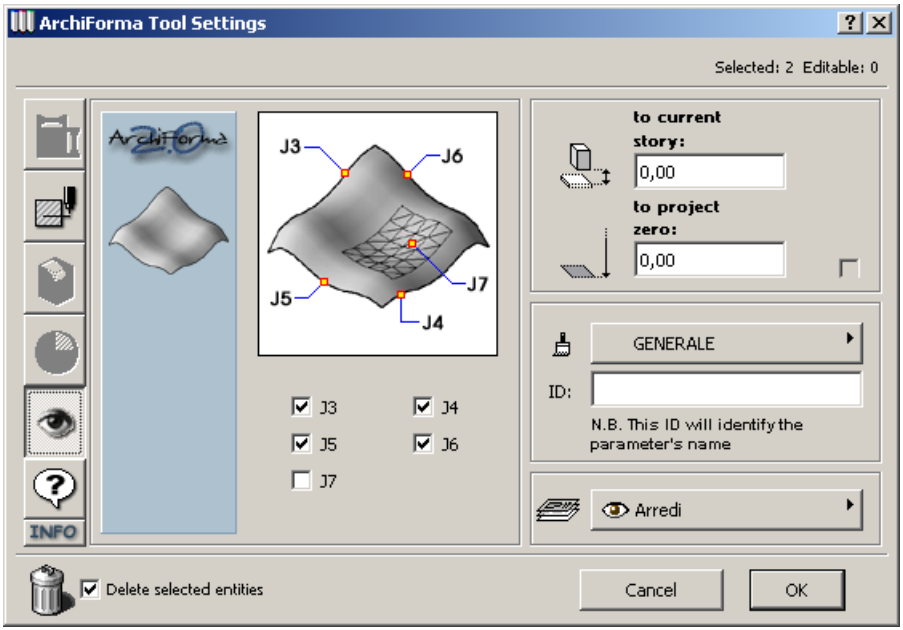
The translational surface box will be displayed. In it, you can look over the attributes section (as already said, the parameters dialog is not required for these tools).

In the lower left part of the box, there is the icon with trash. If you enable the corresponding check-box, ArchiForma will delete the two 3D Polylines used to create the object. If disabled, the two 3D Polylines will remain positioned on the Plan for future re-uses.

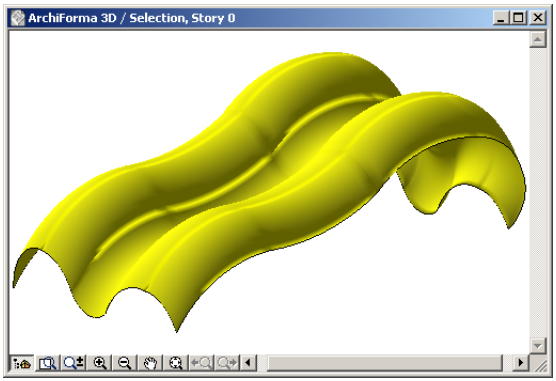
Refer to the previous paragraph *The common commands in the dialog window of ArchiForma tools* for any setting concerning *The attributes box*.

The Visualization Box

With the several check-boxes displayed in this section, you can decide whether to display or not the four edges of the final object as well as the mesh of its surface.



As previously suggested, please refer to the GDL manual enclosed to the ArchiCAD software box, to get more detailed information on the meaning of these values (called "mask values").



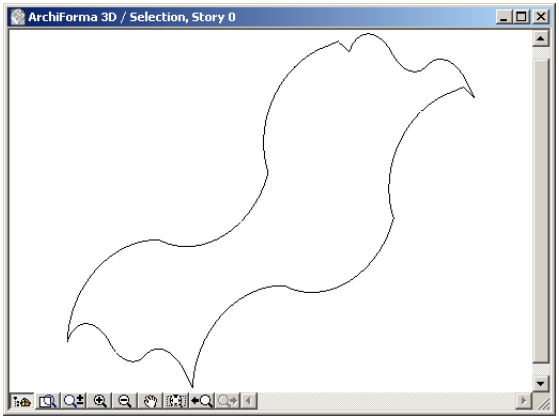
The Coons Surface

Finally, the displayed surface on the palette is the Coons Surface.

Let's start by drawing on the Plan the four profiles for the surface creation, by using the ArchiForma 3D Polyline tool (see the proper description later on):

Please Note *The four profiles must necessarily define a closed polygon in order to generate the final surface.*

IMPORTANT: *For a proper functioning, the two 3D Polylines must have the same number of elements (two arcs > an arc and a line > two lines). If not, ArchiForma will display an error message.*



Select then the four ArchiForma 3D Polylines and click on the Coons surface icon.

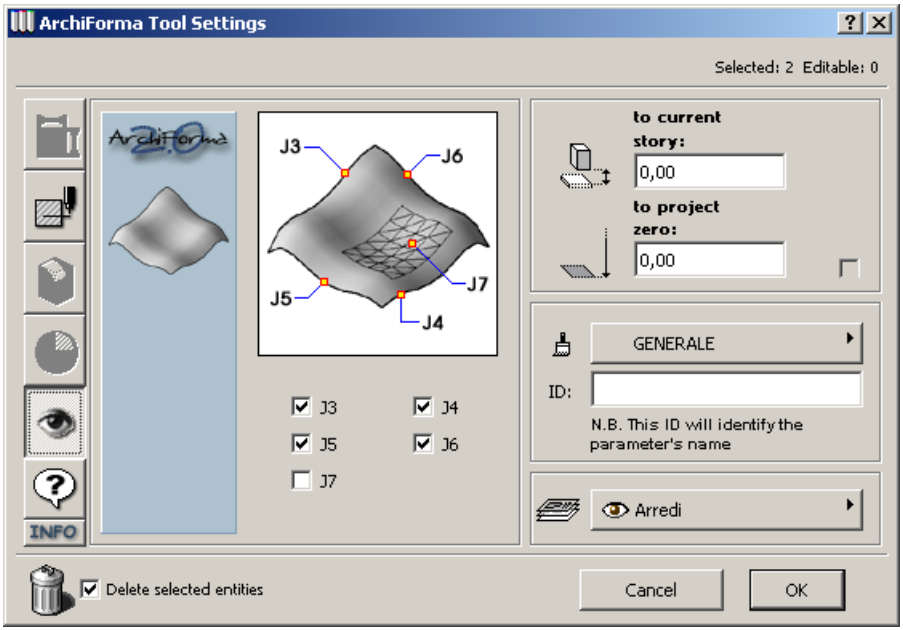
The configuration box for The Coons surface will be displayed. In it, you can look over the attributes section (as already said, the parameters dialog is not required for these tools).

In the lower left part of the box, there is the icon with a trash. If you enable the corresponding check-box, ArchiForma will delete the four 3D Polylines used to create the object. If disabled, the four 3D Polylines will remain positioned on the Plan for future re-uses.

Refer to the previous paragraph *The common commands in the dialog window of ArchiForma tools* for any setting concerning *The attributes box*.

The Visualization Box

With the several check-boxes displayed in this section, you can decide whether to display or not the four edges of the final object as well as the mesh of its surface.



As previously suggested, please refer to the GDL manual enclosed to the ArchiCAD software box, to get more detailed information on the meaning of these values (called "mask values").

Modifying Elements' Tools

Exploding/Updating

If you use the tool featuring an icon with a bomb and a magic wand, you can edit the geometry of any objects you created transforming the primitives selected in the worksheet

The ArchiForma tools you can use with this tool are:

- Irregular Pyramid
- Simple Extrusion
- Ruled Extrusion
- Twister Extrusion
- Bend Extrusion
- Revolution Solids
- Customized Section Spiral
- Extrusion along a Path (Tube)
- Scalar Extrusion along a path (Sweep)
- Ruled Surface
- Translational Surface
- Coons Surface

All the elements generated by ArchiForma can be edited/modified by the user following several methods.

In some cases, it may be easier or necessary to restore the primitives that generated the elements, modify them, in order to update the element they created.

Let's make a simple example.

Let's assume you generated a simple Extrusion by using an ArchiCAD Fill.

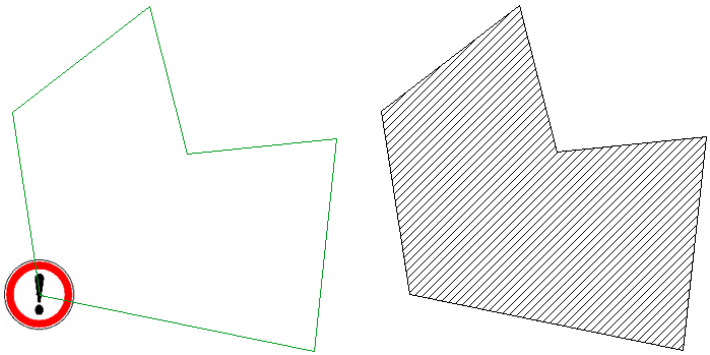
Afterwards, you need to modify this shape adding, or deleting , some nodes to its perimeter or, curving some of its edges, etc.

These operations (adding nodes, deleting nodes, curving edges, deleting curves, etc.) cannot be performed on the element adopting the ArchiForma "standard" techniques. In this case the best help is given by the Exploding/Updating tool.

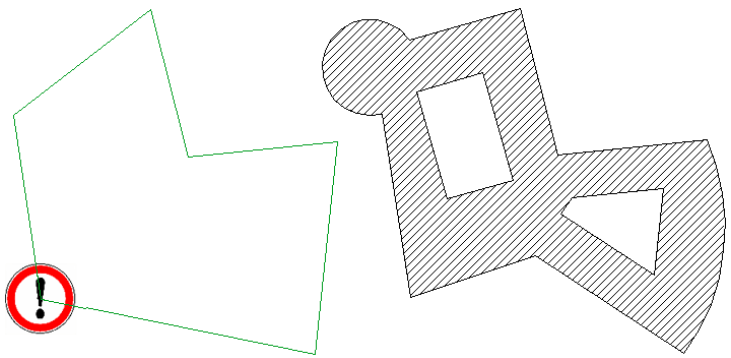
- Select the simple Extrusion element and click on the icon of the Exploding/Updating tool.

The shape of the cursor changes to remind you that ArchiForma is waiting for a click to define the insertion point of the original Fill.

- As soon as you click, ArchiForma inserts the fill on the Plan and highlights the modification status of the simple Extrusion element just processed displaying a little warning icon/symbol).

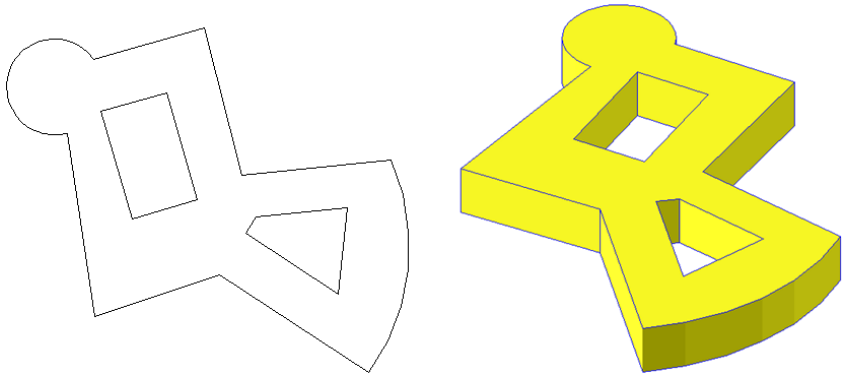


- Now, modify the fill you got as you like (i.e. adding nodes, curving a side, inserting holes, etc.), using the usual ArchiCAD editing techniques.



- As soon as you achieve the intended result/Once you got the needed result, select the original simple Extrusion element, the fill you have just modified and click on the Exploding/Updating tool icon.

ArchiForma will process the new geometry updating the original element yet saving all the modifications (rotations, cuts, holes, etc.) and settings (pens, fills, rounding, etc.) that you implemented before the modification:



As you may have noticed, this is a very simple procedure.

The following summary will help you to use all the available tools.

Irregular Pyramid	
Primitives drawn from the original	**1 fill** representing the pyramid plan
Required clicks necessary to position the primitives	**None**: the fill is superimposed to the original pyramid
Required clicks to update the element using the primitives modifications	**None**
Simple Extrusion	
Primitives drawn from the original	**1 fil**l representing the extruded profile
Required clicks necessary to position the primitives	**1 click**: to define the point for the fill insertion
Click richiesti per aggiornare l'elemento con le primitive modificate	**None**
Estrusione Ruled	
Primitives drawn from the original	**2 fills** representing the two profiles merged by the Ruled Extrusion
Required clicks necessary to position the primitives	**1 click**: to define the point for the basic fill insertion (consequently to the first, the second is positioned)
Required clicks to update the element using the primitives modifications	**2 clicks**: a click on one node of the two fills to define which of the profiles acts as the base and from which one starts the link to the surface acting as the top. The second click to define which node of the second fill will be merged to the node just indicated. (In other words, this is the same procedure you performed when creating the element)

Twister Extrusion	
Primitives drawn from the original	**1 fill** representing the extruded profile
Required clicks to position the primitives	**1 click**: to define the point for the fill insertion.
Required clicks to update the element using the primitives modifications	**None**
Extrusion Bend	
Primitives drawn from the original	**1 fill** representing the extruded profile
Required clicks to position the primitives	**1 click**: to define the point for the fill insertion
Required clicks to update the element using the primitives modifications	**None**
Revolution	
Primitives drawn from the original	**1 fill** or **1 ArchiCAD polyline** according to the original element used to define the revolution profile
Required clicks to position the primitives	**1 click**: to define the point for the fill insertion or for the ArchiCAD polyline
Required clicks to update the element using the primitives modifications	**None**
The customized section spiral	
Primitives drawn from the original	**1 fill** representing the customized section of the spiral
Required clicks to position the primitives	**1 click**: to define the point for the fill insertion
Required clicks to update the element using the primitives modifications	**None**

Extrusion along a path (Tube)	
Primitives drawn from the original	**1 fill** representing the extruded section along the path **1 hotspot** defining which is the node that runs along the path referring to the section **1 ArchiForma 3D Polyline** representing the extrusion path
Required clicks to position the primitives	**1 click**: to define the point the point for the fill insertion
Required clicks to update the element using the primitives modifications	**1 click**: to define which is the node that runs along the path referring to the section (to obtain the same initial result, click on the Hotspot automatically generated during the explosion)
Extrusion along a path (Sweep) with predefined regular section scalar	
Primitives drawn from the original	**1 ArchiForma 3D polyline** representing the extrusion path
Required clicks to position the primitives	**None**
Required clicks to update the element using the primitives modifications	**None**
Scalar Extrusion along a path (Sweep) with customized section	
Primitives drawn from the original	**1 fill** representing the extruded section along the path **1 ArchiForma 3D Polyline** representing the extrusion path
Required clicks to position the primitives	**1 click**: to define the point of insertion of the fill
Required clicks to update the element using the primitives modifications	**None**

Ruled surface	
Primitives drawn from the original	**2 ArchiForma 3D polylines** representing the two original merging curves
Required clicks to position the primitives	**None**
Click richiesti per aggiornare l'elemento con le primitive modificate	**2 clicks**: to identify the first node on the first polyline that will merge the first node on the second polyline (the same procedure you performed when creating the element)
Translatory surface	
Primitives drawn from the original	**2 ArchiForma 3D polylines** representing the two original curves (profile and path)
Required clicks to position the primitives	**None**
Required clicks to update the element using the primitives modifications	**None**
Coons Surface	
Primitives drawn from the original	**4 ArchiForma 3D polylines** representing the perimeter of the generated surface
Required clicks to position the primitives	**None**
Required clicks to update the element using the primitives modifications	**None**

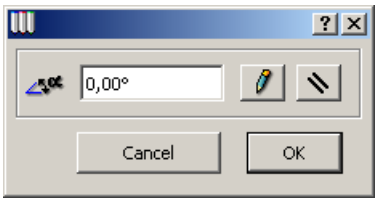
Rotation

With the Rotation tool you can rotate in the space all the elements generated with ArchiForma.

The Rotation tool can be used both in the ArchiCAD Plan and in the 3D window, (the only difference is that in the Plan window the pencil icon for the graphic definition of the rotation angle, is disabled).

You can rotate even more than 1 object at the same time but make sure that you select at least one ArchiForma element before clicking on the Rotation tool icon.

After clicking on the tool icon, the following dialog box will be displayed:



In the unique editable field here available, you need to enter the value of the rotation angle.

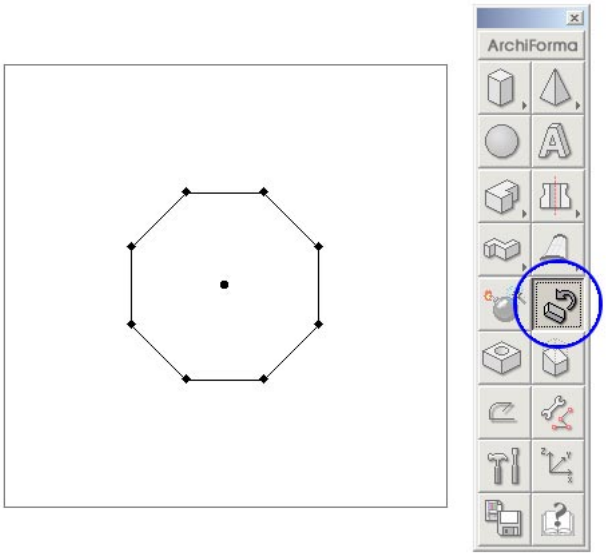
If you are working in the 3D window, you can enable the graphic definition of the angle by clicking on the pencil icon (this action will automatically disable the editable field).

If you want to parallel the selected element (or the elements, in case of multiple selections), click directly on the icon with this parallel symbol.

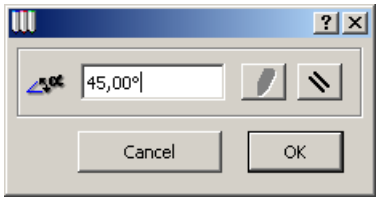
How to rotate an element on the Plan window

Let's assume you want to rotate a prism positioned on the Plan.

- Select the prism and click on the Rotation tool icon.

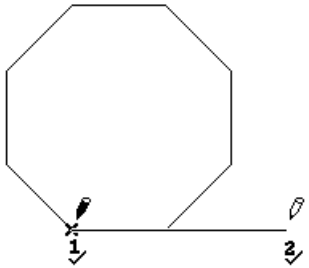


ArchiForma will display the dialog window for the rotation settings (we are now on the Plan window so that the pencil icon for the graphic definition of this value is disabled)



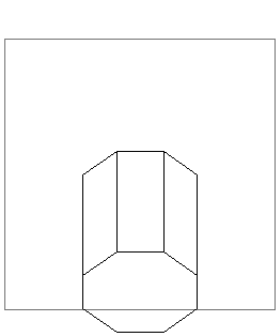
- Digit/Enter the rotation angle you need to obtain (for example: 45°) and confirm by pressing the OK button.

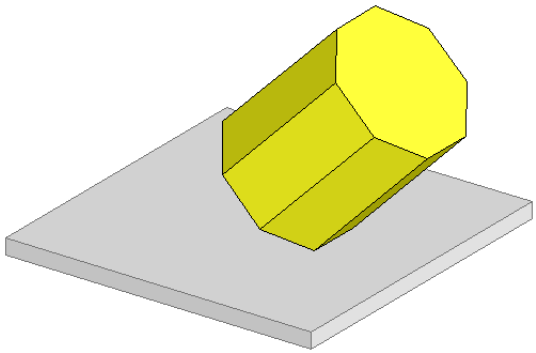
ArchiForma closes the Rotation settings dialog window and turns into a pencil the shape of the cursor waiting for you to define the rotation axis of your element with two clicks.



When you are working on the Plan, the height of the rotation axis is always zero.

Once defined the rotation axis, the element will be rotated as you require.

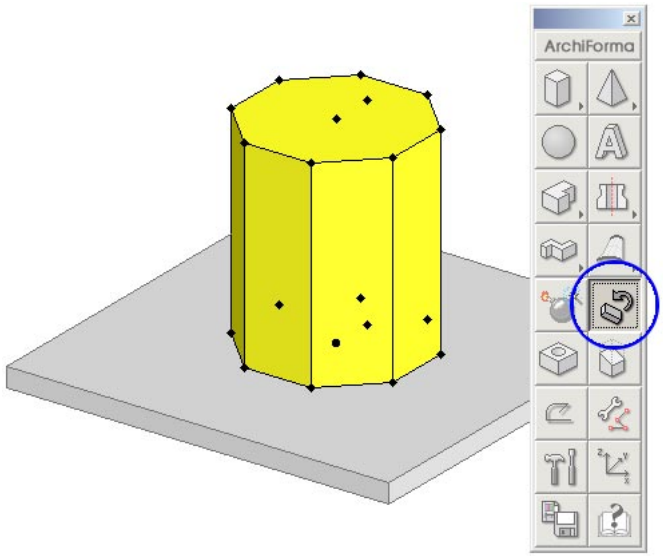




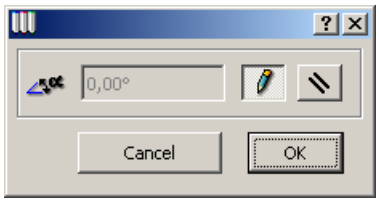
How to rotate elements in 3D

Let's assume now we want to rotate the same prism in the 3D window.

- Select the prism and click on the Rotation tool icon.



ArchiForma displays the dialog box for the rotation settings and, as you are working in the 3D box, the pencil icon for the graphic definition of this value will be enabled.



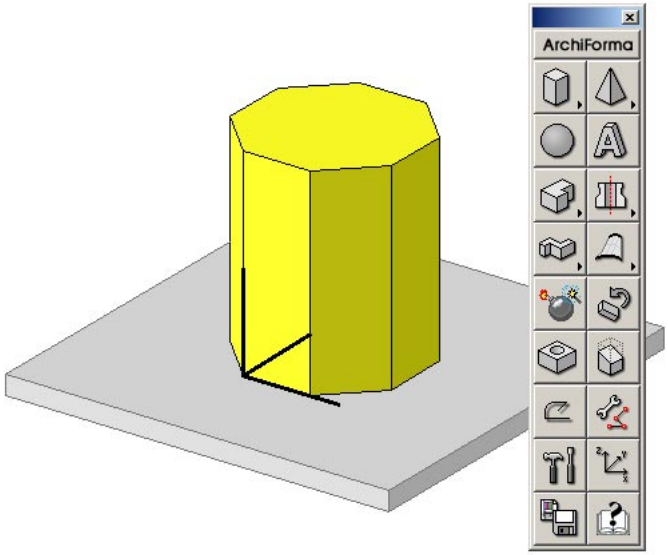
- Now you can enter the needed rotation angle (as we saw on the Plan rotation) or enable the pencil icon to define graphically the rotation angle. Choose this second option and confirm the configuration with the OK button.

ArchiForma closes the Rotation settings box and turns into a pencil the shape of the cursor waiting for you to define the rotation axis of your element with two clicks.

As you are working in the 3D box, pay special attention to the height of the rotation axis which you can define as you like, by using the original user positioning modes provided by ArchiCAD.

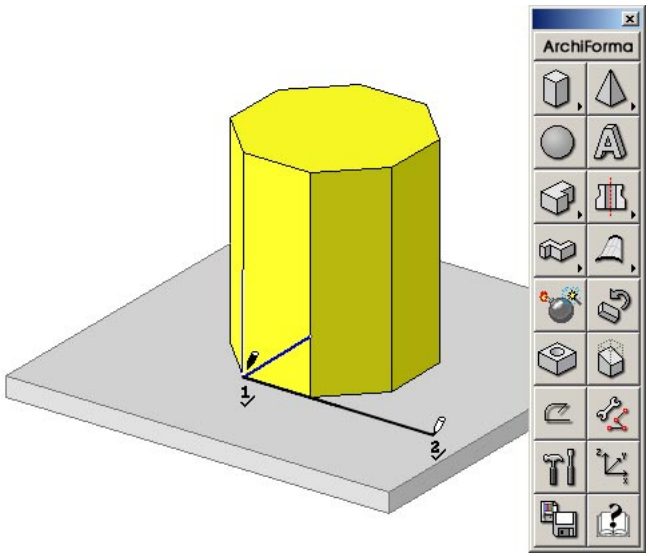
- Before you click for the first time, click on the Origin icon of the ArchiCAD Coordinates Box.

- Click then on one node of the prism base in order to move into this point the User Origin of the 3D window.



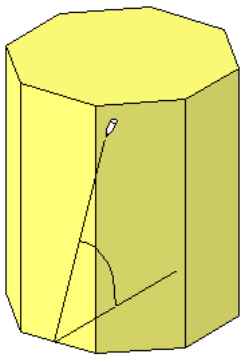
Now the rotation axis will pass through the User Origin.

- With two clicks you can define its two end points.



If you have entered the value of the rotation angle, ArchiForma will rotate the element, as required, around the axis you just defined (as we saw on the Plan rotation window).

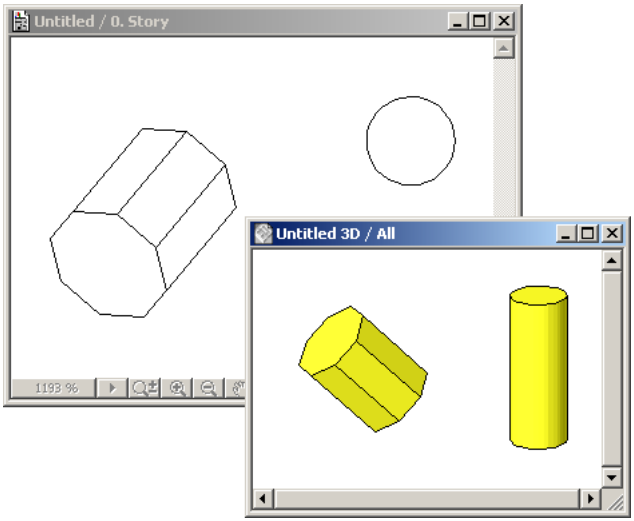
- Since you chose the graphic definition of the rotation angle, now you need to move the cursor in the 3D window to define this value graphically, according to the snaps on the elements and checking the preview displayed by ArchiCAD.



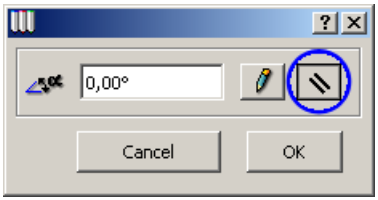
- With one click you confirm this value, so that ArchiForma will rotate the element as required.

How to parallel an element to an existing one

Let's assume now we have inserted a cylinder on the plane and we want to assign the same sense of direction (rotation) of an existing prism previously rotated.

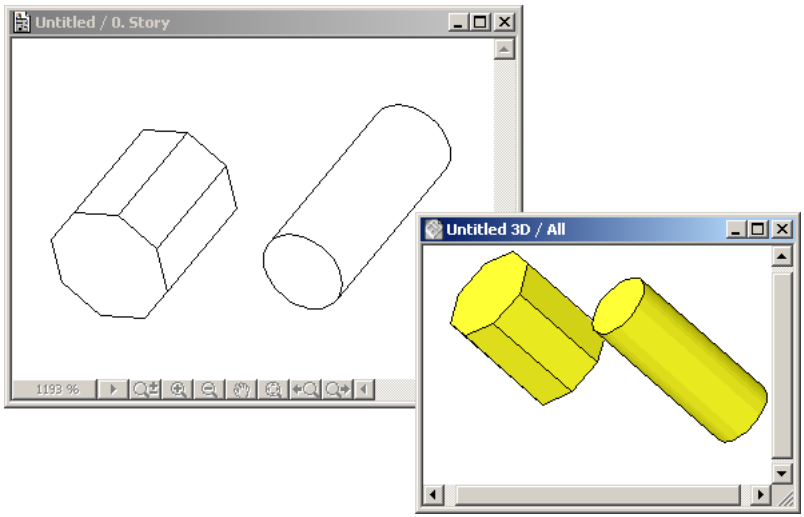


- Select the element (or elements) you want to parallel and click on the Rotation tool of the ArchiForma palette.
- As soon as the rotation settings dialog window is displayed, click on the Parallel button.



- The settings box closes immediately and ArchiForma changes the shape of the cursor waiting for you to define, with a click, the element to which your selection must be positioned in parallel
- With a second click, you can define the point crossed by the rotation axis (once again, if you are working in the 3D window, it's very important to configure the height of the User Origin in order to set also the Z coordinate of this point!).

Once these two clicks had been done, ArchiForma gets now all the necessary information to rotate the element and displays immediately the result:



The Hole Tool

It's very easy to create holes in the ArchiForma elements (any ArchiForma element can be drilled and can contain to 20 holes maximum).

The procedure to hole an element can be divided into two steps:

1. creation and positioning of the solid-hole with which you will drill the element;
2. drilling the element.

With the same tool, you can perform three different operations:

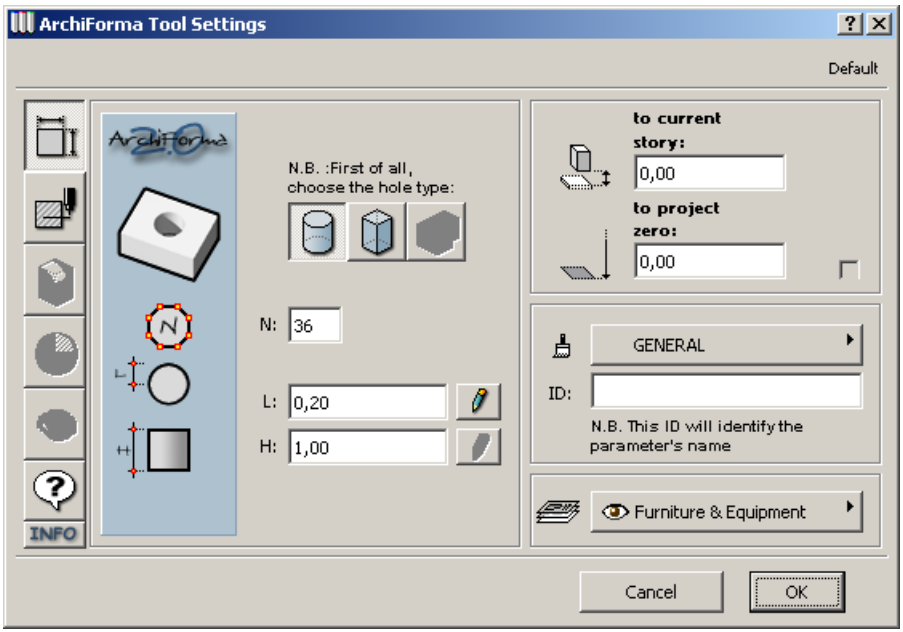
1. creating an hole element;
2. holing an ArchiForma element;
3. eliminating an hole from an ArchiForma element already holed.

Creating an hole element

With ArchiForma, you can create elements such as: cylindrical holes, regular polygons, free shapes.

Cylindrical holes and regular polygons

To create an element such as a cylindrical or polygonal hole, click on the drill tool Icon and ArchiForma will display its settings box.



The box is almost similar to those described for the Prism tool and the Cylinder tool.

With the first three buttons on the top, you can select the type of hole you are going to generate.

The third button (free shape hole) is enable only if, before clicking on the Hole tool icon, you selected a fill (in this case, you generate the hole shape extruding the perimeter of the fill).

In the numerical input field "N", set the number of parts into which you need to split the circle (in case of cylindrical hole). This value can change from a minimum of 3 to a maximum of 255 parts. For regular polygonal holes, you need to define the number of sides of the hole.

In the "L" field, set the radius of the hole (in case of cylindrical hole) or the length of the side of the hole (in case of regular polygonal hole).

In the "H" field, set the height of the element.

The pencil icon (graphic definition of a parameter in the 2D and 3D) has the same value as the one described for the other tools.

Refer to the previous paragraph The common commands in the dialog window of ArchiForma tools for any settings concerning The attributes box.

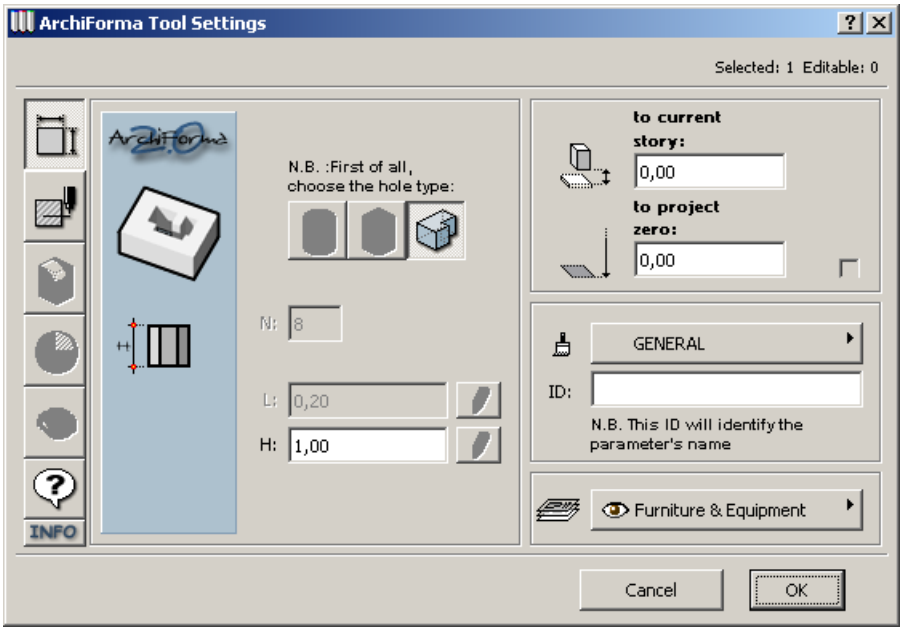
The other settings (rounding, development, visualization) are not available for this kind of element.

Confirm the configuration by pressing the Ok button. The cursor changes its shape waiting for a click in order to define the point for the positioning of the hole.

Free shape holes

To create a free shape hole element, you should follow the same procedure as the one described for the simple Extrusion tool.

Draw an ArchiCAD fill contouring the perimeter of the hole; select it and click on the Hole tool icon. ArchiForma will display the dialog settings window.



The selected fill do not have to contain holes (it would be a nonsense to define a holed hole!). Nevertheless, if you select a holed fill, ArchiForma will consider only its perimeter nodes.

When you create free shape holes, the only editable field enabled is the "H" field which defines the height of the hole element.

The pencil icon (graphic definition of a parameter in the 2D and 3D) has the same value as the one described for the other tools.

Refer to the previous paragraph *The common commands in the dialog box of ArchiForma tools* for any setting concerning *The attributes box*.

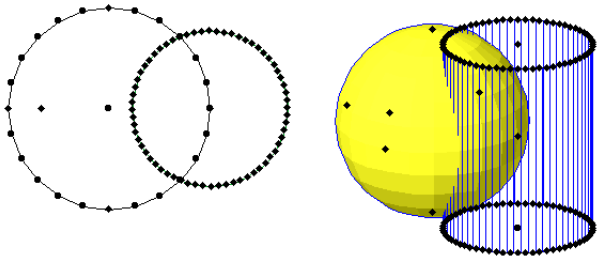
All the other settings (rounding, development, visualization) are not available for this kind of element.

Confirm the configuration by pressing the Ok button and ArchiForma will close the settings box of the hole replacing the selected fill with an ArchiForma hole element.

Drilling an ArchiForma element

As already mentioned above, it's very easy to drill an ArchiForma element :

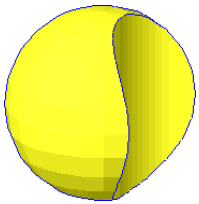
Select the element to be drilled as well as the hole element that you will use for the drilling and click on the icon Hole tool: ArchiForma will immediately modify the original element drilling it as requested.



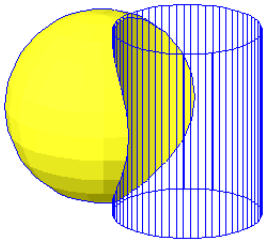
The Sphere will be drilled at once.

Some important remarks:

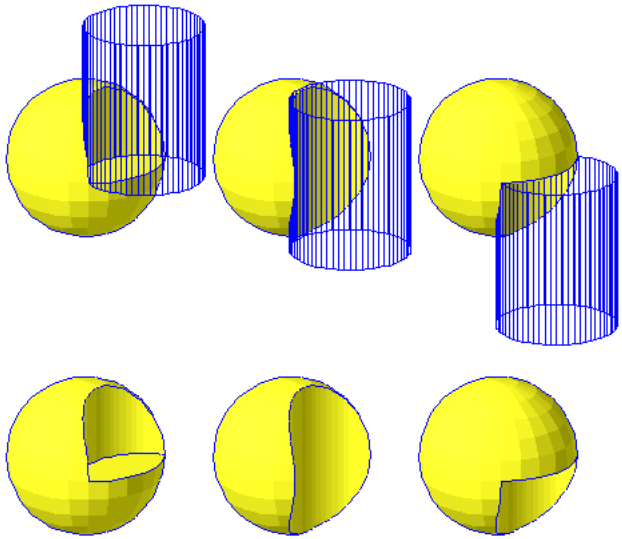
- after drilling the element, you can delete the hole element you have used, the element you drilled (in this case the Sphere) is not at all "linked" to the hole element you used.



- the hole elements are always displayed in the Wire mode a part from the current ArchiCAD settings.



- the hole on the shape you are supposed to process, fully corresponds to the hole element you used. So that it's important its position in the space respect to the element you need to drill. Let's make it clear with the following examples: three spheres will be drilled by three hole elements set a in different way.



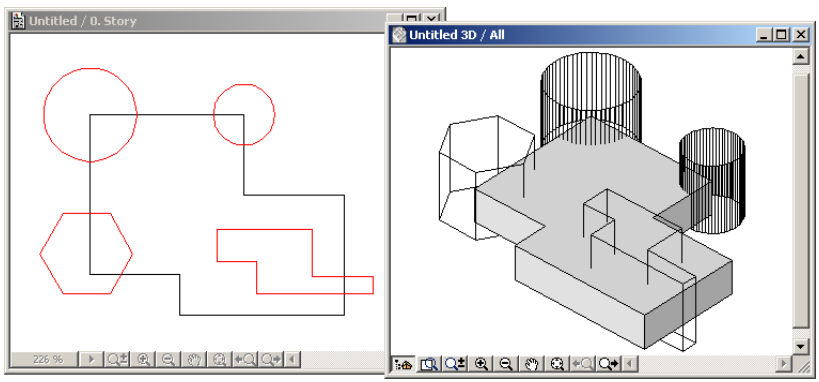
- To rightly perform this procedure, the selection can contain as many Archiforma element to be drilled as you want (ensure that all of them must be crossed by an hole) but ONLY one element.

Deleting an hole and restoring the original shape

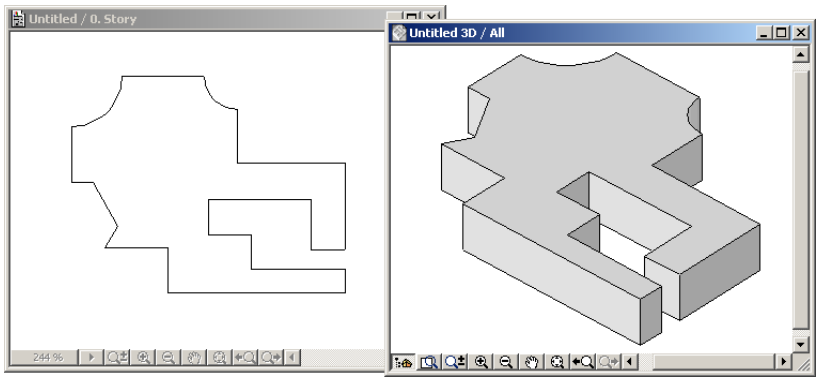
If you select ONLY ONE ArchiForma element previously drilled and you click on the Hole tool icon, ArchiForma will display a special window, listing all the holes done on the selected element (specifying, next to it, the proper typology. Moreover, it allows you to delete the holes you want, in order to restore the element shape.

Let's see an example:

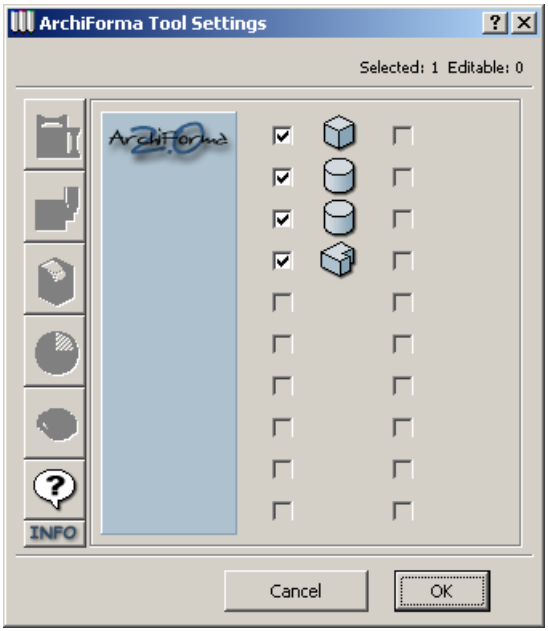
The following image shows a simple Extrusion element and 4 hole elements (2 cylindrical holes, 1 regular polygonal hole and 1 free shape hole):



1. follow the procedure just described to drill the extrusion element for each positioned holes and, then, delete the 4 hole elements.

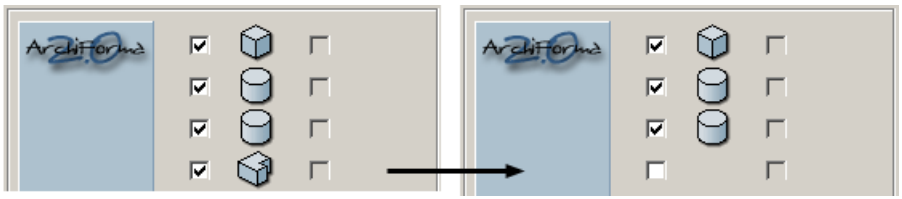


2. now select the extrusion element and click on the Hole tool icon on the ArchiForma palette:

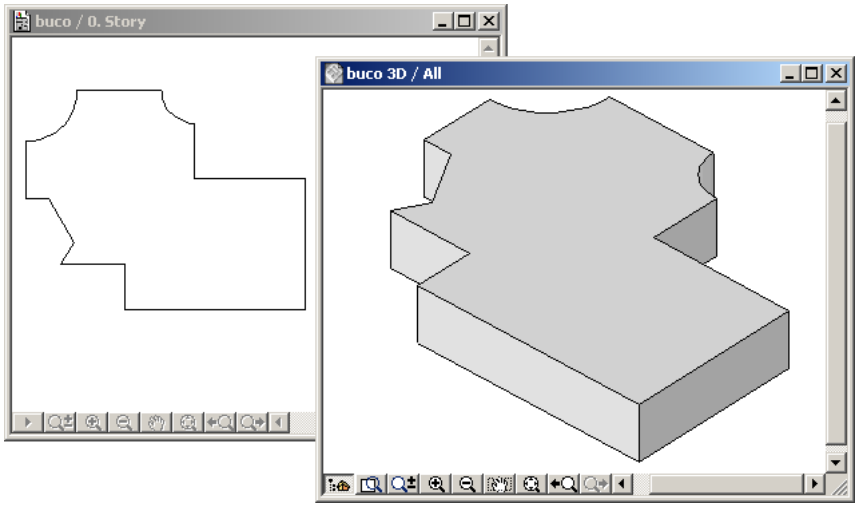


ArchiForma displays this dialog window (see above) showing how many holes had been drilled on the selected element and the type of hole you drilled.

If you want to delete an hole, you simply need to disable it clicking on the corresponding check-box. Delete the free shape hole.



This is the result after closing the frame by clicking on the **OK** button.



In the just shown example, it's much more difficult, obviously, to establish, among holes of the same type, which of the two check-boxes (the second one or the third one) corresponds to the smallest cylindrical hole.

Should you find yourself in such a situation, we suggest you to disable one of the two check-boxes, verify your final result and, if it is not as you like, you will cancel the modification (Edit Menu / Undo External Command or Ctrl+Z for Windows and Command+Z for Macintosh) and repeat the operation with another check-box until you obtain the desired result.

The Cutting planes

With ArchiForma you can “cut ” the elements by using the Cutting plane tool.

Any ArchiForma element can contain up to 10 different Cutting planes.

Similarly to the procedure applied to the Hole tool, you should follow the two steps below to cut the element:

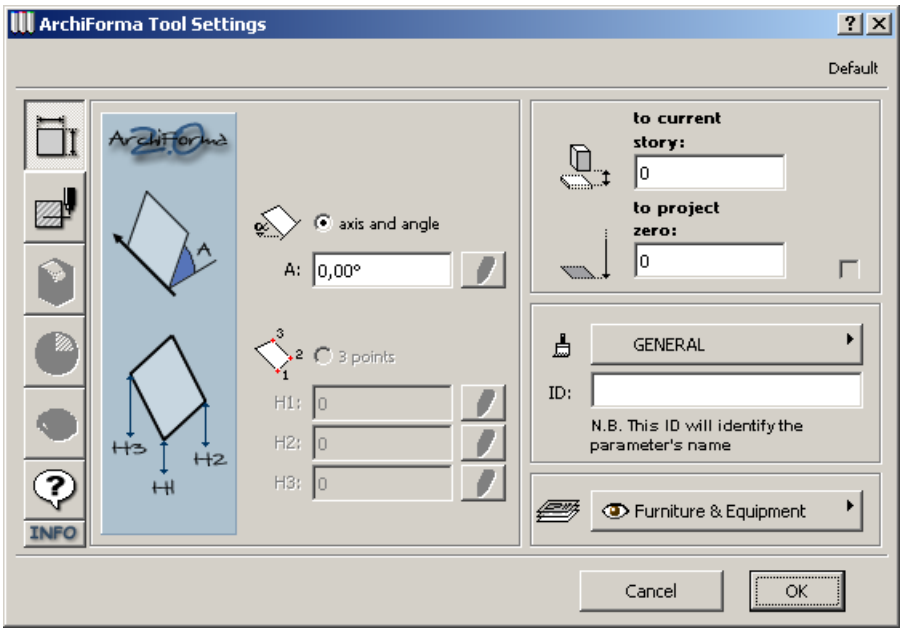
1. creation and positioning of the cutting plane with which you will cut the element;
2. cut the element.

With the same tool, you can perform three different operations:

- creating a cutting plane;
- cutting an ArchiForma element;
- deleting a cut from an ArchiForma element already cut.

Creating a Cutting plane in the plan

If you wish to create a Cutting plane in the plan window, click on the Cutting plane tool from the ArchiForma palette. The dialog settings window of the Cutting plane will be immediately displayed.



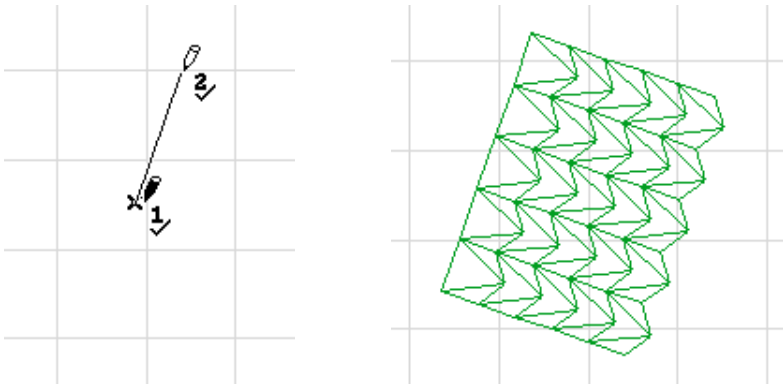
In the Plan window, are available only the axis rotation option and the angle one, where, in the field identified by the letter "A", you can enter the inclination of the Cutting plane respect to the X-Y horizontal plan.

Refer to the previous paragraph The common commands in the dialog window of ArchiForma tools for any setting concerning The attributes box.

All other settings (rounding, development, visualization) are not available for this kind of elements.

Define the inclination angle (i.e. 45°) and confirm the configuration by pressing the Ok button.

The shape of the cursor changes and ArchiForma waits for you to define, with two clicks, the insertion and sense of direction of the Cutting plane element.



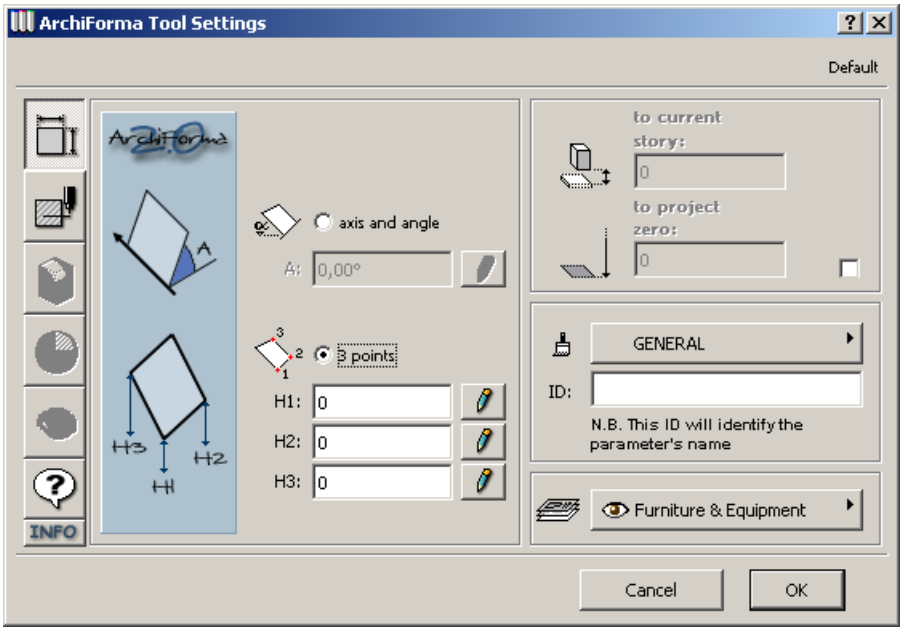
Once these two clicks had been done, ArchiForma displays a cutting element, such as a particular object (always represented as a Wire, a part from any ArchiCAD settings) representing the unlimited Cutting plane you have just generated.

This last concept is very important: the Cutting plane is unlimited and is not limited by the dimensions of the object that represents it.

The "tips", that's to say the top vertexes of the pyramids of the Cutting plane object, help you to understand the sense of direction: the tips mark the "frontal" part of the object and the opposite one, the "rear part". This will be particularly important when deciding whether to cut or not the frontal or the rear part respect to the processed Cutting plane.

Creating a Cutting plane in the 3D window

If you wish to create a Cutting plane in the Plan window, click on the Cutting plane tool from the ArchiForma palette. The settings box of the Cutting plane will be immediately displayed.



If you wish to create a Cutting plane in the Plan window, click on the Cutting plane tool from the ArchiForma palette. The settings box of the Cutting plane will be immediately displayed.

In the 3D window, besides the rotation axis option and the angle option (just described in the previous paragraph) there is also the 3 points option. In the fields identified by letters "H1", "H2" and "H3" you can set the heights of these 3 consecutive points (their X-Y coordinates will be defined with 3 clicks on the 3D window). Obviously, 3 points on the space identify univocally a plane and, with this mode, you do not need to define numerically or graphically the inclination angle of the plane.

If you enable the pencils icons next to the three fields just described, you will also define the height of the three points in graphic mode. The following three clicks on 3D window will display all the information you may need on the X-Y-Z coordinates.

Selecting the rotation axis and angle option (which works just like the one of the Plan) you can define graphically the inclination value by properly clicking on the 3D window.

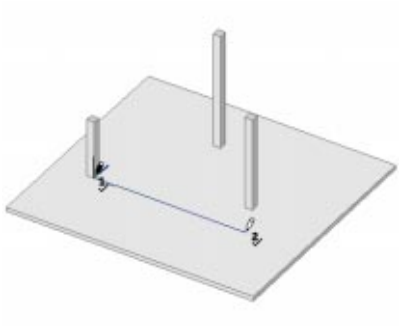
Refer to the previous paragraph The common commands in the dialog box of ArchiForma tools for any setting concerning The attributes box.

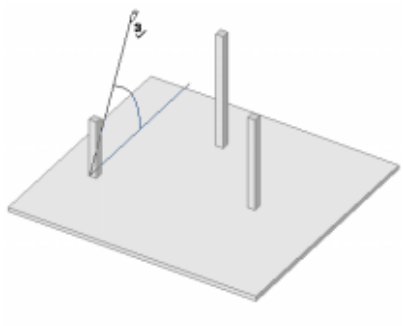
All the other settings (rounding, development, visualization) are not available for this kind of elements.

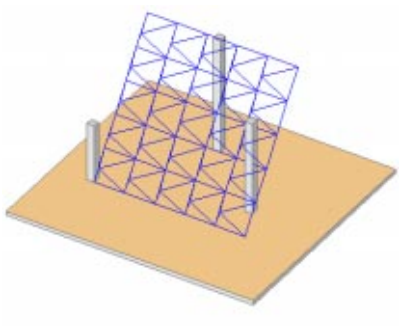
Define the inclination angle (i.e. 45°) and confirm the configuration by pressing the Ok button.

Let's see the two different procedures enabling the graphic mode for both of them:

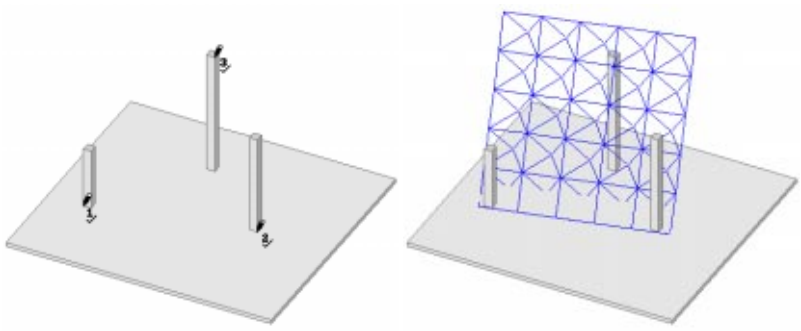
For Axis and Angle:





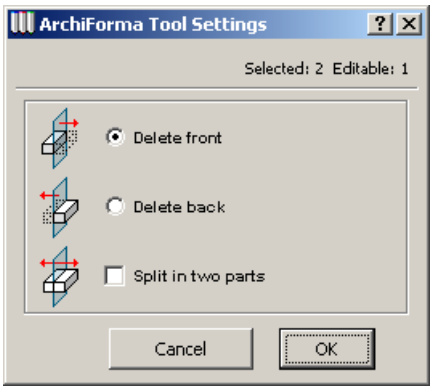


For 3 Points:



Cutting an ArchiForma element

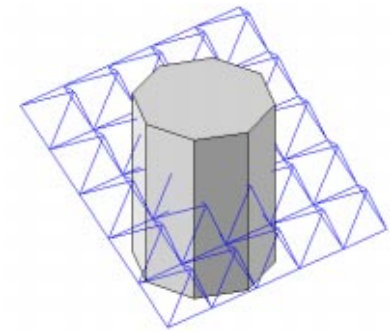
Select either the element to be cut (or the elements, as you can also make multiple selections) or the Cutting plane element to be used and click on the Cutting plane tool icon. ArchiForma immediately displays the dialog window for selecting the type of cut.



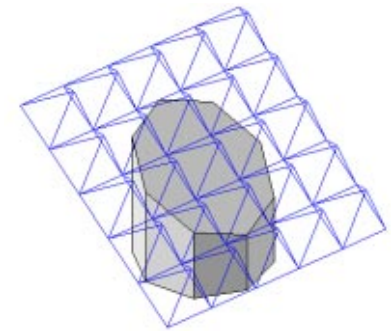
In this box, you can decide how to proceed:

- cutting/deleting the selection part in the front side of the selected Cutting plane (the one indicated by the "tips");
- cutting/deleting the selection part in the rear side of the selected Cutting plane (opposite to the one indicated by the "tips");
- splitting the element into two, that's to say creating two halves (two cut elements). In this case, to facilitate the selection of the new elements, on one side of the cutting plane, the halves will be lightly inserted in a shifted position respect to the original.

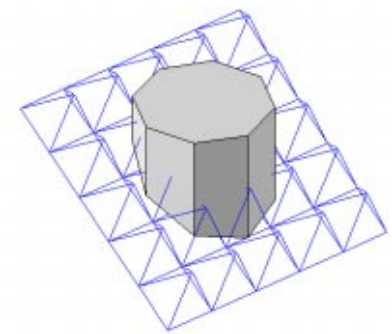
Let's see the following example: a prism crossed by a Cutting plane at 30°.



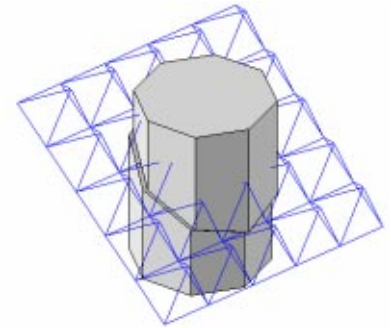
This is what happens if you cut the front side (the one indicated by the "tips").



This is what happens if you cut the rear side (opposite to the one indicated by the "tips").

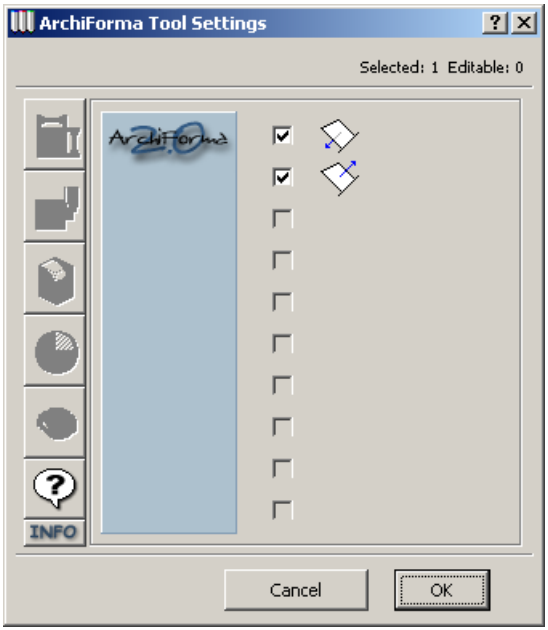


This is what happens if you split the element into two.



Deleting the cut and restoring the original shape

If you select ONLY ONE ArchiForma element previously cut and click on the Cutting plane tool icon, ArchiForma will display a special window listing all the cuts you have performed on the selected element (indicating on its side the sense of direction) and allowing you to delete the desired cuts in order to restore the shape of the element.



To delete a Cutting plane, you simply have to disable it by clicking on the corresponding check-box.

When the dialog window is closed and the settings are confirmed by pressing the OK button, ArchiForma restores the original shape of the element eliminating the deselected Cutting plane.

Obviously it will be difficult to distinguish which of the check-boxes in the dialog box corresponds to the Cutting plane you really want to delete (this, if the selected element had been cut more that once using the same cut direction).

Should you find yourself in such a situation, we suggest you to disable one of the two check-boxes, verify your final result and, if it is not as you like, you will cancel the modification (Edit Menu / Undo External Command or Ctrl+Z for Windows and Command+Z for Macintosh) and repeat the operation with another check-box until you obtain the desired result.

Miscellaneous

The last set of icons in the ArchiForma palette displays tools for different uses:

- 3D Polyline tool;
- "Modify 3D Polyline" tool;
- "Modify Mode" tool;
- Cartesian Axis Origin tool;
- "Save as ArchiCAD Object" tool;
- On-line Help tool.

The 3D Polyline tool

By clicking on this button you can create an ArchiForma 3D Polyline.

The ArchiForma 3D Polylines are mainly used to represent the polylines in the space which will be further used to create other ArchiForma elements.

Here is a short summary of their applications:

Simple extrusion along a path (Tube): A 3D Polyline may represent the three-dimensional coordinates of the extrusion path;

Scalar Extrusion along a path (Sweep): may represent the three-dimensional coordinates of the extrusion path;

Ruled surface: two 3D Polylines represent the three-dimensional coordinates of the two profiles merged by the resulting surface;

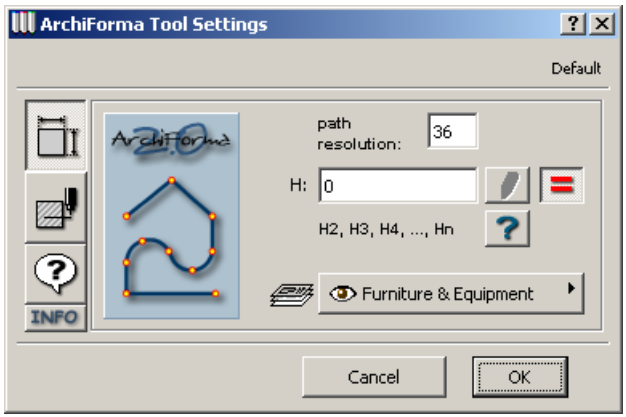
Translational surface: two 3D Polylines represent the three-dimensional coordinates of the profile of the surface and the path along which the profile is extruded;

Coons Surface: Four 3D Polylines represent the three-dimensional coordinates of the four profiles merged by the resulting surface.

Please Note *the ArchiForma 3D Polylines are "linear" elements without thickness. If you want to visualize them always with any type of visualization, you must use the 3D OpenGL engine or if you use the ArchiCAD 3D Internal engine, you should enable the "Analytical" and "Better" options, in the 3D Window Settings dialog (Image / 3D Window Settings), in the section dedicated to the Shading method*

The parameters box

Click on the ArchiForma 3D Polyline tool icon and the following parameters box will be displayed.



The "Resolution" editable field identifies the number of segments that you need to split the curved parts of the 3D Polyline.

The editable field identified by the letter "H" shows the height of the first node of the 3D Polyline.

The three buttons to the right of the field "H" have the following meaning.

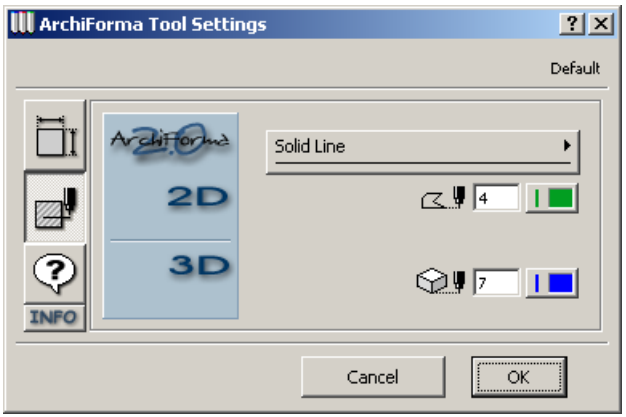
Graphic editing. This option is enable only for the 3D window. If you enable this option, the height of the point will be obtained from your clicking in the 3D window: clicking on the vertex of an element (checkmark cursor) you will set the spatial coordinates (X-Y-Z) of that point to the node of the polyline.

Homogenous heights. If you enable this option, all the nodes of the polyline will have the same height: the one set in the field "H". The polyline lays on a parallel plane to the horizontal plane X-Y.

Single height. If you enable this option, the first node of the polyline will have the height set in the field "H" while the following nodes may assume different heights according to the settings entered in the 3D Polylines Input Palette.

The attributes box

The **attributes** button controls the information about the visualization of the 3D Polylines in the Plan and in the 3D window.



With the upper pop-up menu, you can select the line-type used to represent the 3D Polyline in the Plan.

The first control for the pen selection refers to the pen color used to represent the 3D Polyline in the Plan.

The second control for the pen selection refers to the pen color used to represent the 3D Polyline in the 3D window.

The 3D Polylines Input Palette

As soon as you confirm the settings clicking on the OK button, the parameters box of the 3D Polyline will close and the 3D Polylines Input Palette is displayed on the screen.

Before drawing an ArchiForma 3D Polyline as a test, let's see the meaning of the controls included in this palette.

Linear edge definition: If this control is enabled (lowered) you are drawing some linear edges of the polyline.

Curved edge definition: If this control is enabled (lowered) you are drawing some curved edges of the polyline. A curve edge is identified by three points: the starting point of the curve, a second passing point and the final point of the curve.

Height setting: This is the field where you define the height of the point you are to create. This field is disabled if, in the parameters box of the polyline, the "Homogeneous Height" or the "Graphic Editing" options have been activated. In the "Homogeneous Height" option all the points of the polyline should have the same height: the one defined in the dialog box; while In the "Graphic Editing" option the height is automatically obtained from the point clicked in 3D windows.

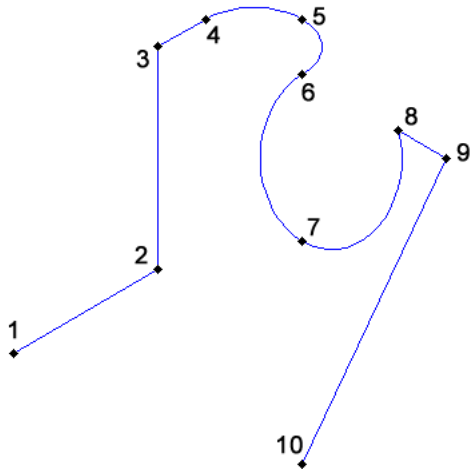
To finish drawing an ArchiForma 3D Polyline:

- Press the "Esc" key on the keyboard. In this case you leave the drawing procedure of the Polyline on the last point you clicked on.
- Press the "Cancel" button on the ArchiCAD Control Box. In this case you leave the drawing procedure of the Polyline at the last point you clicked on.
- Press the "OK" button on the ArchiCAD Control Box. In this case you leave the drawing procedure of the Polyline that will close by folding up (3D Polyline closed).
- Click again on the last point you have inserted. In this case you leave the drawing procedure of the Polyline at the last point you clicked on.

ATTENTION: *the two points must have the same height, otherwise the polyline cannot be closed. This is obviously important if you want to create sequential nodes at different height values.*

Example of a 3D Polyline drawing on the plane

Let's assume you want to draw the following the 3D Polyline:



The X-Y-Z coordinates of the 10 nodes of the 3D Polyline are the following ones:

P1 (0, 0, 0)

P2 (0, 1.5, 0)

P3 (0, 1.5, 2)

P4 (0, 2, 2)

P5 (0.5, 2.5, 2)

P6 (1, 2, 2)

P7 (1.5, 1.5, 1)

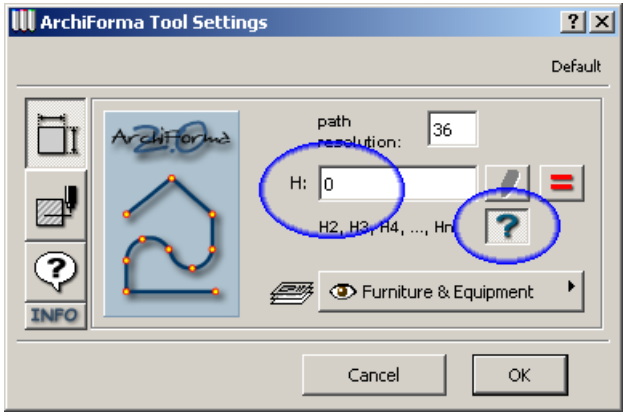
P8 (2, 2, 2)

P9 (2.5, 2, 2)

P10 (2.5, 0.5, 0)

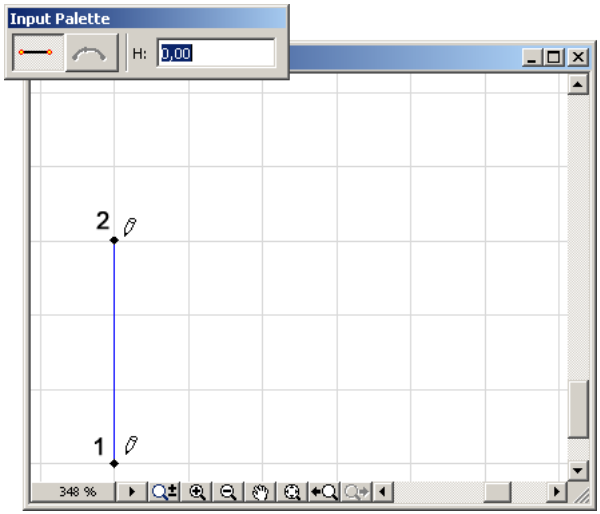
To better understand the previous example, you should configure the construction grid with a 0.50m x 0.50m step as well as enable the grid snap.

Click on the 3D Polyline tool and configure the parameters box as follows:

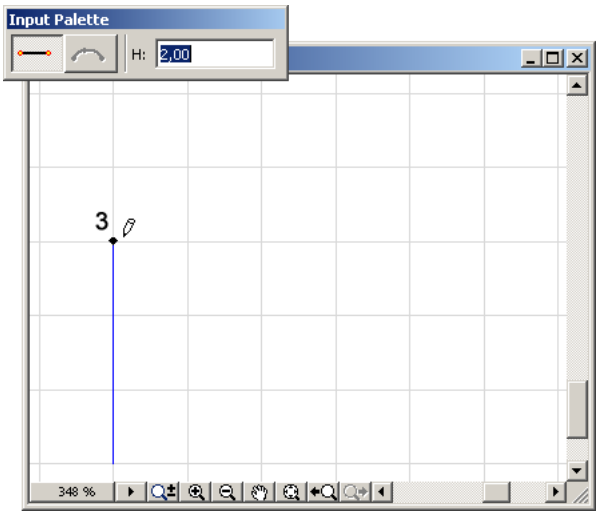


Confirm with the OK button and go back to the Plan box where ArchiForma will immediately display the Polyline Input palette.

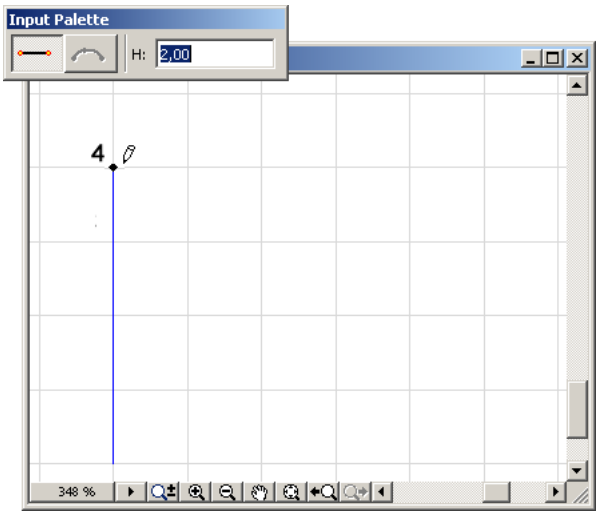
The first edge is a linear segment that goes from point 1 (0, 0, 0) to point 2 (0, 1.5, 0); leave then the settings of the Input palette as they are and make a simple click on the two points.



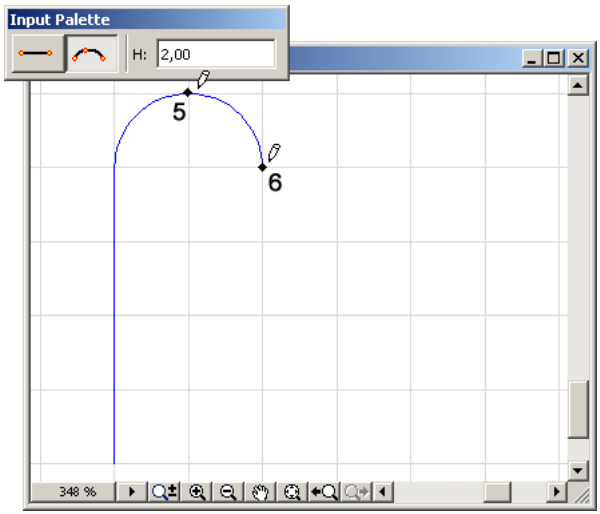
The height of the following point is different (Z=2) so that, before you click on it to define its position, you should enter the new height value in the input box.



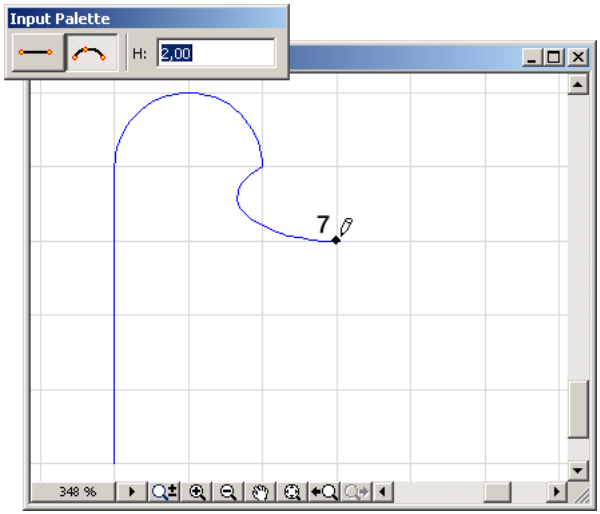
Now draw the following stroke, here the height does not change so that you do not have to modify the settings of the input palette.



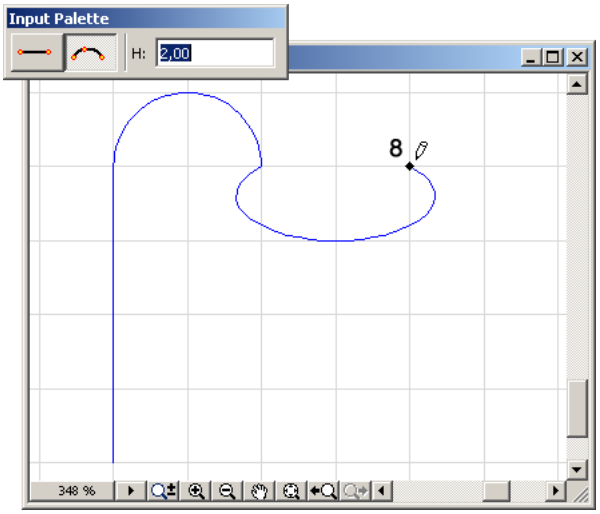
Now switch to the drawing of the curve by clicking on the proper button placed in the Input palette (the height still remains the same).



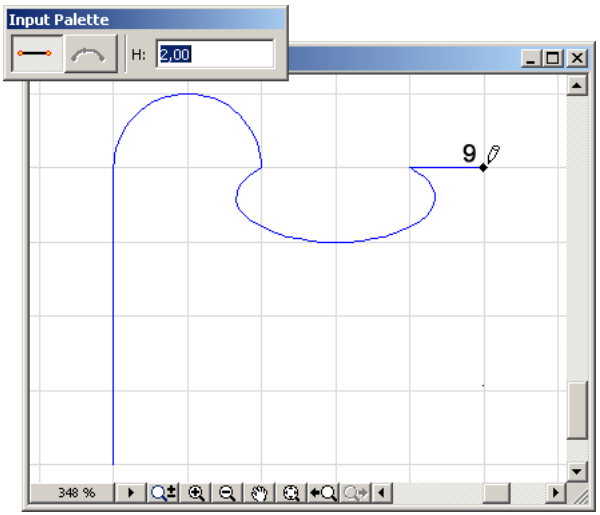
Go on drawing the second curve, modifying the height of the passing point.



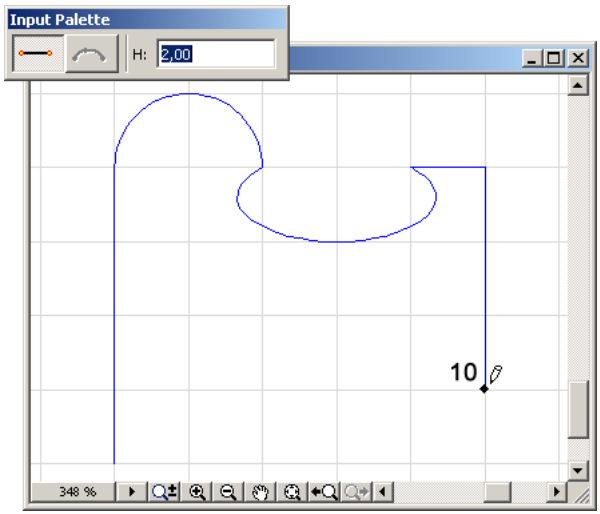
Reset the height to 2 and complete the drawing of the arc.



Switch now to the linear edge tract mode by clicking on the proper button and define the last but one point.



Modify again the height and click twice on the last point to complete the drawing of the 3D Polyline:



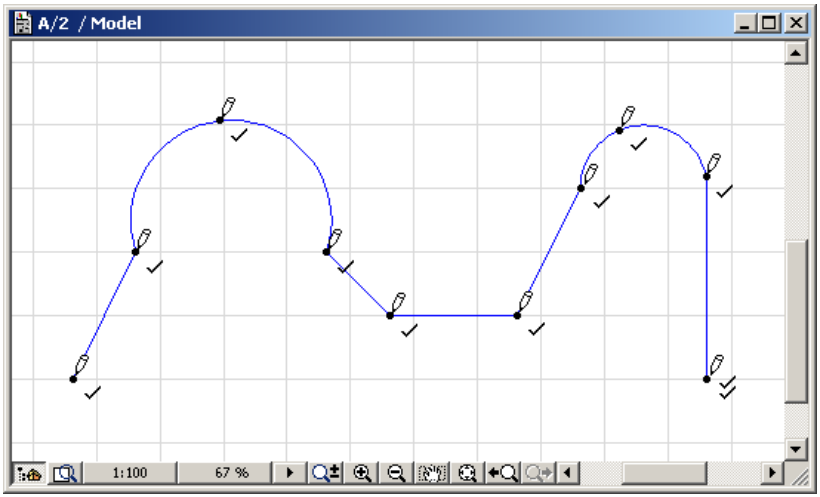
Drawing 3D Polylines in the ArchiCAD Section/Elevation windows

Sometimes it could be useful to draw a 3D Polyline directly in an ArchiCAD Section/Elevation window (as you should need to transfer an elevation profile or because the polyline essentially develops along the vertical plane).

The drawing of the 3D Polylines in the Section/Elevation windows is almost similar to the one we considered for the Plane and the 3D window.

Clicking on the 3D Polyline tool icon with a foreground close up Section/Elevation windows, the settings dialog window will be displayed but, in this case the parameters box is disabled (only the Attributes box is available) as the height of the points will be defined directly by clicking on the Section/Elevation window (whose development is properly vertical).

As soon as you complete the 3D Polyline drawing (with the methods above described), ArchiForma will automatically display in the foreground the Plan window waiting for you to define with two clicks the insertion point and the sense of direction of the polyline.



The “3D Polyline Modifying” tool

Clicking on this button you will be displayed the ArchiForma “3D Polylines Modifying” Palette.

The ArchiForma 3D Polylines may be edited/modified using several methods, but some functions may be carried out only using the “3D Polyline Modifying” Palette.

Click on the “3D Polyline Modifying” tool icon and the Modifying palette will be displayed.

The function of the six buttons are the following:

Add node: click on a node of a polyline to insert a new node.

Delete node: click on the node of a polyline to delete it.

Curve side: click on the node of a polyline to replace the two segments converging on it, by an arc passing through the node you clicked on.

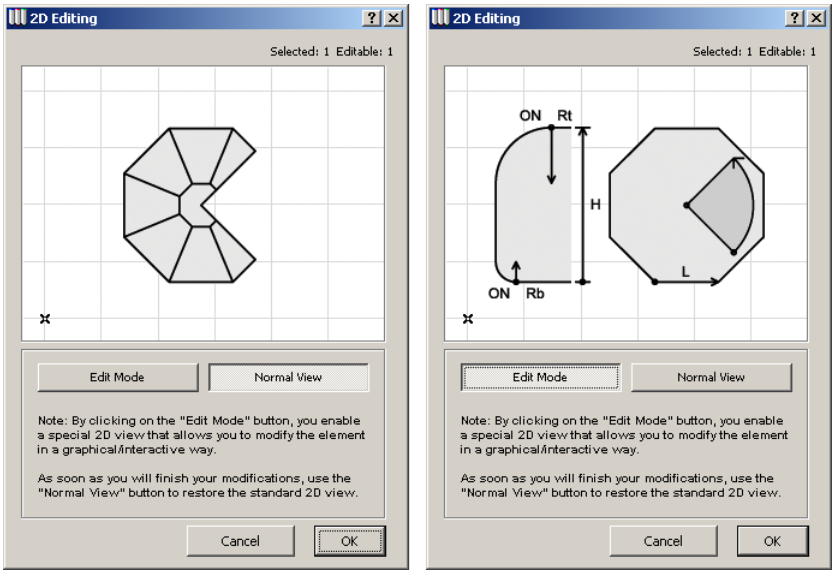
Straighten Curve: click on the central node of an arc to replace it with two segments merging the ends of the arc itself with the node you have clicked on.

Merge Polylines: click on one end of a polyline and then on the end of another Polyline to “merge” them in one entity only.

Cut Polyline: click on the node of a polyline to split it into two separate Polylines.

"Modifying Mode" Tool

This tool of the ArchiForma Palette is a switch for the Plan visualization: clicking on it after selecting an ArchiForma element (or more since multiple selections are admitted) it will be displayed the switching dialog box:

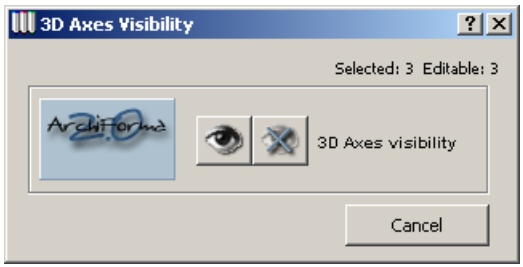


The two central buttons help you to select the visualization mode and the upper example image shows the corresponding result.

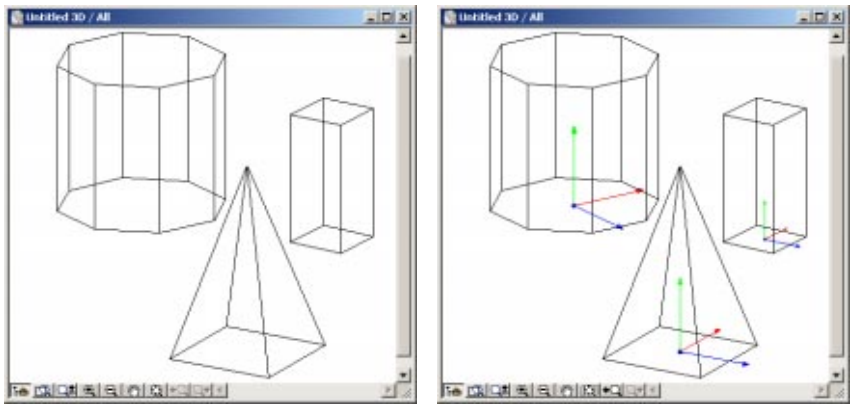
The editing mode simplifies remarkably the graphic modification of the elements which have been rotated in the three-dimensional space. You can find a detailed description of this command on the chapter Edit/modify the ArchiForma elements (for more detailed information see that specific chapter).

The Cartesian Axis Origin tool

This tool of the ArchiForma Palette is rig htly a visualization switch: clicking on it, after selecting an ArchiForma element (or more since multiple selections are admitted) the visualization enabling/disabling box of the local origin of the Cartesian axis of the element (both in the Plan and in the 3D window) will be displayed:



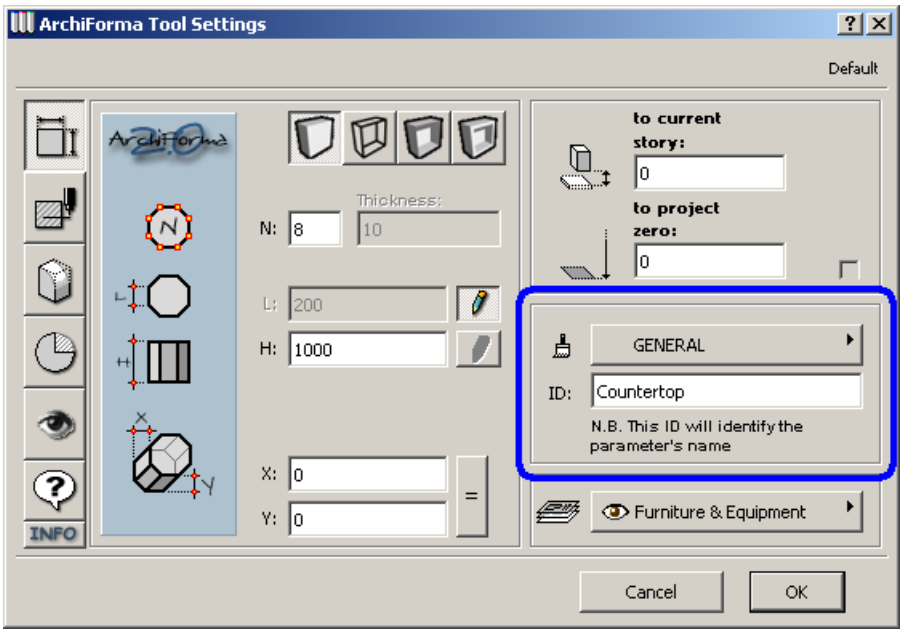
By clicking on the two buttons (Show/Hide) the dialog window closes and the selected elements are updated.



The "Save as an ArchiCAD Object" tool

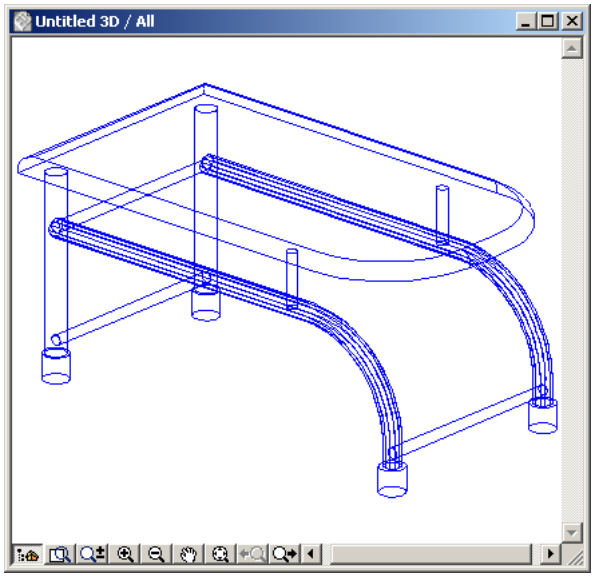
By clicking on the icon of this tool after selecting one or more ArchiForma elements, the whole selection will be saved in the ArchiCAD Object format as an element of the parametrical library.

The whole parametrical system of the objects saved by ArchiForma depends on the ID code of the configurable material for each ArchiForma element:



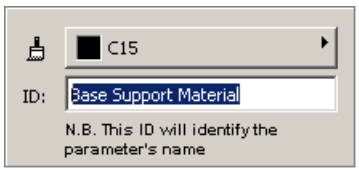
If configured correctly while creating the elements or before using the ArchiCAD "**Save as Object**" tool, the string you entered in the ID code field will become, within the object thus saved, the description of the variable controlling the material of each parts of the library element.

Let's see the following example.

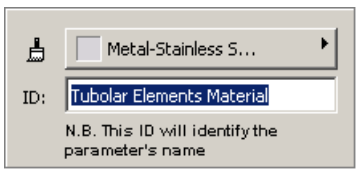


Create four little cylinders representing the support bases and open their settings box by clicking on the Cylinder tool.

With reference to the material, select the "C15 material" which will become the "standard" material of the objects while for the ID code, enter "Support Bases material" which will describe the variable.

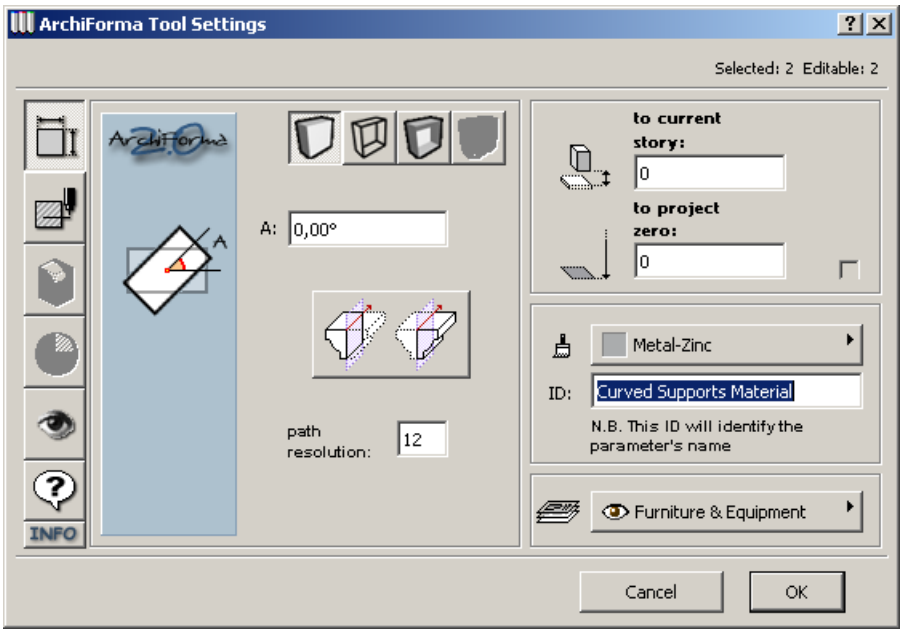


Now create the tubular elements of the structure (in this case too, all of them are ArchiForma cylinders) and open its settings box by clicking on the Cylinder tool.



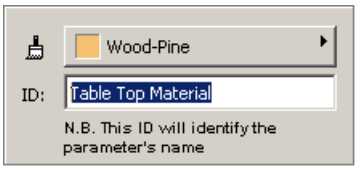
With reference to the material, select the "Stainless steel" material which will become the 'standard' material of the object, while for the ID code, enter the "Tubular Elements Material" which will describe the variable.

Now create the two curved supports (two ArchiForma extrusions along a path) and open their settings box by clicking on ***Extrusion along a path tool (Tube)****.*



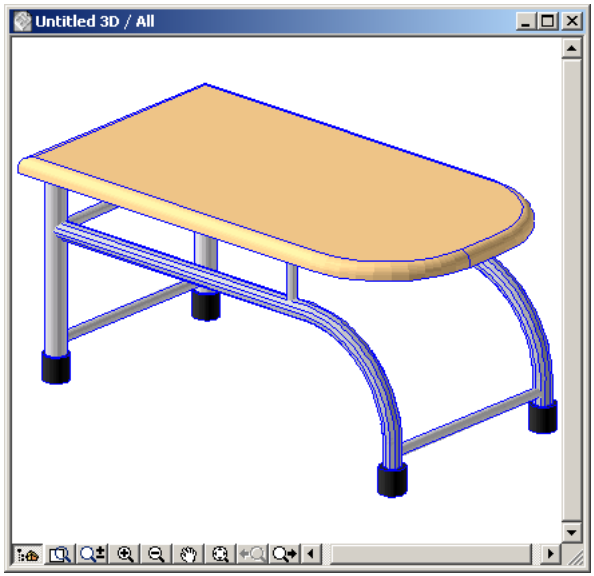
With reference to the material, select the "Zinc" materiall which will become the 'standard' material of the object, while for the ID code, enter the "Curved Support Material" which will describe the variable.

Finally create the top of the table (a simple ArchiForma extrusion) and open its settings box by clicking on the ***Simple Extrusion*** *tool.*



With reference to the material, select the "Pinewood" material which will become the 'standard' material of the object, while for the ID code, enter the "Table Top Material" which will describe the variable.

This is the result in the Shading mode.

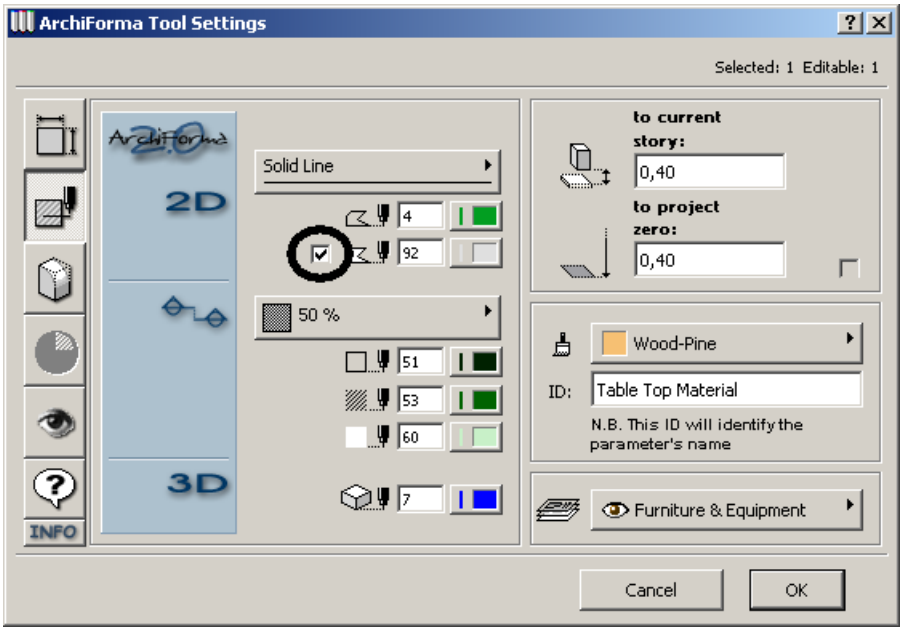


In the final object, the Hotspots automatically inserted in its 2D symbol will play a key role as they can become points of insertion for this object.

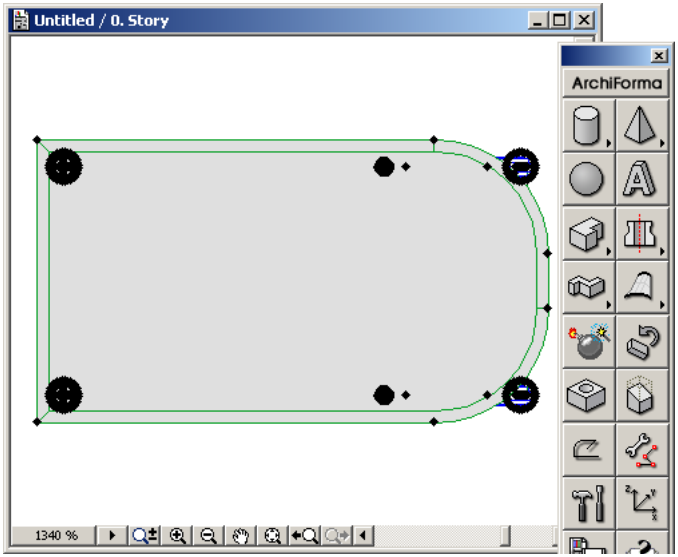
Their creation is obtained from the configuration of the ArchiForma elements symbol which make up this whole:

The elements with a fill (it could even be an empty fill) will generate 2D hotspots.

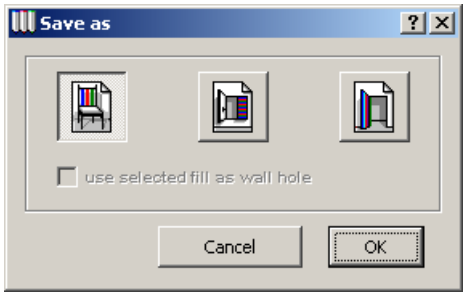
In your example, let all the elements without a background fill, except for the top of the table.



Once you have completed this configuration too, you can select the elements and click on the "**Save as an ArchiCAD Object**" tool.



As soon as you click on Save, the dialog box will be displayed: you can decide whether to save your element as an object, a window or a door.
If you select the last two typologies, you can enable the option "Use selected fill as wall hole", with which you can create holes with irregular shape.



If you do not enable this described option, a door/window will be created where the architectural hole corresponds to the rectangular bounding box of element generated by ArchiForma.

If you want to create doors/windows with irregular shape, draw with the fill the shape you intend to give to its proper architectural hole, select then this fill together with the ArchiForma elements before you save the result.

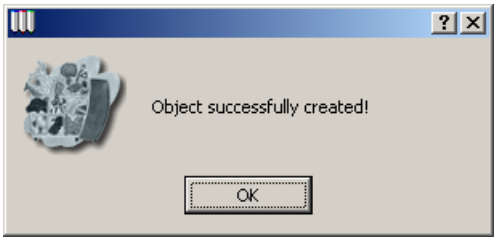
Enabling the check-box, your irregular door/window will respect the specifications you need.

In the just described example, select the first option.

Once confirmed the file format, ArchiForma will ask you the name of the element you are creating and where you want to save it.

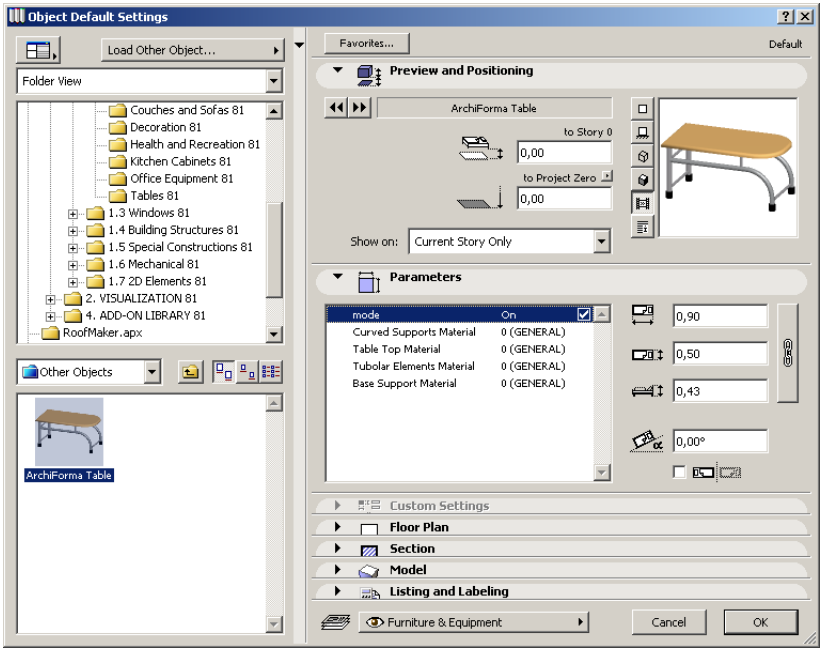
Now ArchiForma needs a certain processing time for performing some selections and deselections. It will also enable several times the 3D window.

At the end of this procedure, a dialog window will inform you about the successful creation of the object.



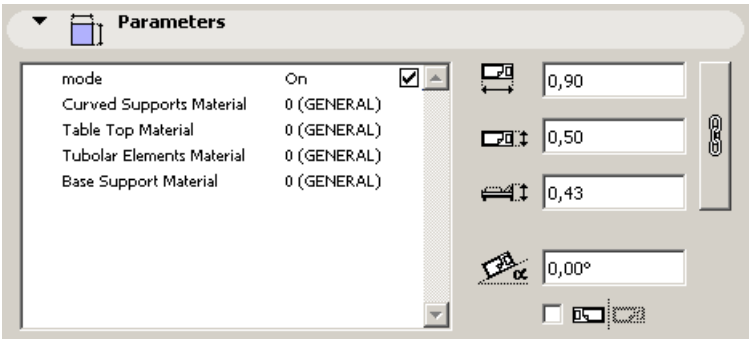
And your parametrical object has been finally created!

Let's see the result in the ArchiCAD Object Settings box.



The elements thus saved are parametric library parts.

You can either resize the object along the three axes (by using the editable fields on the right, as you would do with any ArchiCAD library part) or organize the surface materials by configuring their parameters in the proper manner.



The first "Default" parameter enables the customization of the surfaces materials:

- If the "Default/Standard" parameter is enable, the object is represented with the "original" surface materials (those assigned when the ArchiForma elements had been saved in ArchiCAD Object format).
- If the "Default/Standard" parameter is disable, the object is then represented with the surface materials, selected in the following parameters.

With all the parameters, except the first one, you can organize the surface material of the single parts of the Object (their descriptions, as you may have noticed, are those set in the ID code of the ArchiForma elements you used to save the object).
Customizing the three dimensions, disabling the "Default" parameter and configuring the following surface parameters as you like, you can perform any "variations" on the original element:

The Module files saved with the Object

When you save a selection of ArchiForma elements as a library part using the corresponding command, ArchiForma saves automatically (in the same position where the object had been saved) a Module file reporting all the ArchiForma elements used.

This way, if you need to create afterwards a new object similar to the previous one but in it you need to modify "in detail" some geometrical features (let's suppose you want to modify in the previous example the radius of the tubular elements or modify and/or delete the rounding of the top), you can re-open this module file and modify the ArchiForma elements as you like but save at the end, the modified whole once again in the ArchiCAD Object format.

The on line Help tool

The last tool of the ArchiForma palette is the on line Help.

Clicking on the icon of this tool, the ArchiForma manual in PDF format (the present manual) will be displayed. You will find all the information you require for running/using the software.
To display the user manual in PDF format, you need to install Adobe Acrobat Reader (which is enclosed to the ArchiCAD software box, or you can also download it for free from the Adobe web site) in your computer.

Editing/modifying the ArchiForma elements

All the ArchiForma tools/objects that you will use to build your objects can be edited/modified by using different working methods.

You are free to select the type of method you will be using, it's up to your current needs to choose this one or that one: it depends on the position of the element, on the window in which you are currently working.

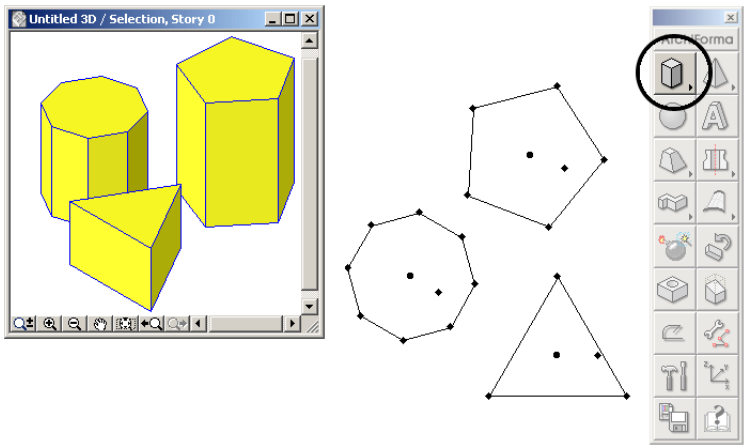
The available methods are the following:

- Modification using the tool settings dialog box;
- Graphic Modification using the editable hotspots;
- Modification using the "Edit mode" tool.

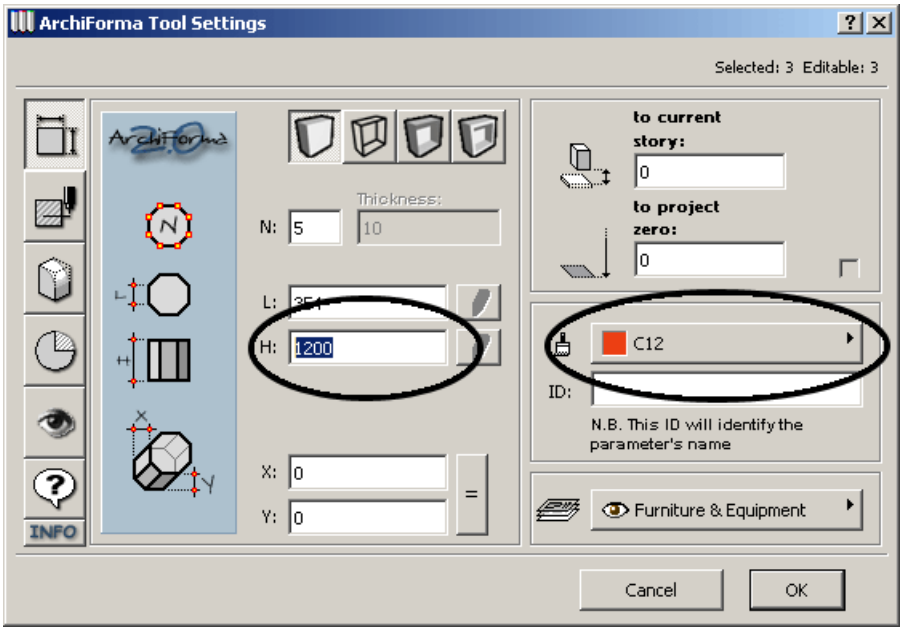
Modification using the tool settings dialog window

This is the standard modification mode of the ArchiForma elements very similar to the one used to modify any ArchiCAD element.

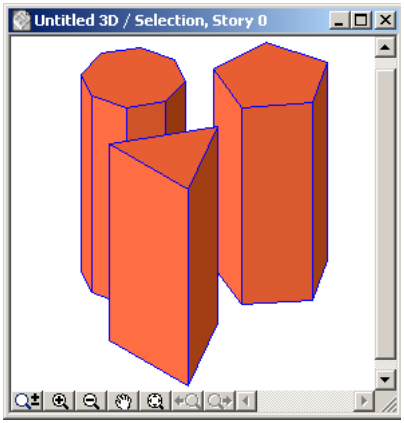
Select an ArchiForma element (or more, but of the same type) and click on the tool icon which has generated it in the ArchiForma Tools palette.



Make the required modifications using the several sections of the dialog window and then confirm the settings by clicking the OK button.



The element (or the elements) is immediately updated.



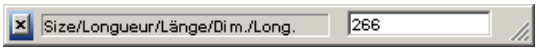
Graphic Modification using the editable hotspots

All the ArchiForma elements enable some intelligent editable hotspots (which, from AC.8.1, are displayed in a different way if compared to the normal hotspots), allowing you to modify several parameters which rule the geometry of the element (node positions, sides length, heights, development angles, etc.).

To edit graphically an ArchiForma element (both in 3D an in 2D):

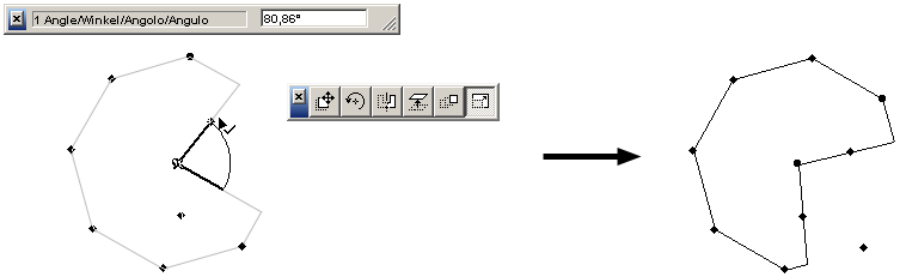
- Select it so to display its hotspots;
- Move the cursor into one of its editable hotspots and click with the button of the mouse;
- Keep pressed the button of the mouse, select from the ArchiCAD Pet Palette the icon to modify the parameter graphically.

- Drag the hotspot to the desired position (graphic input) or enter the new value of the parameter (numerical input) in the editable field.

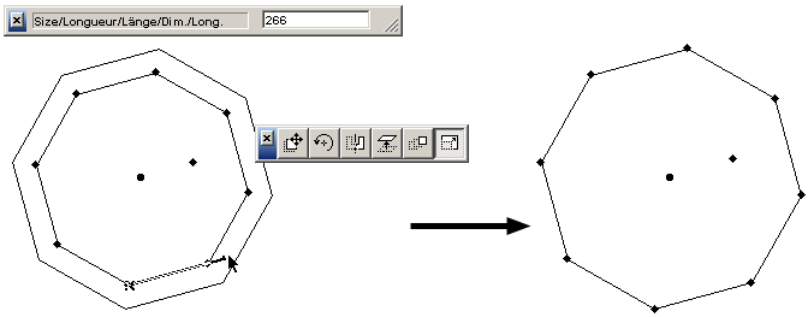


Let's see some examples:

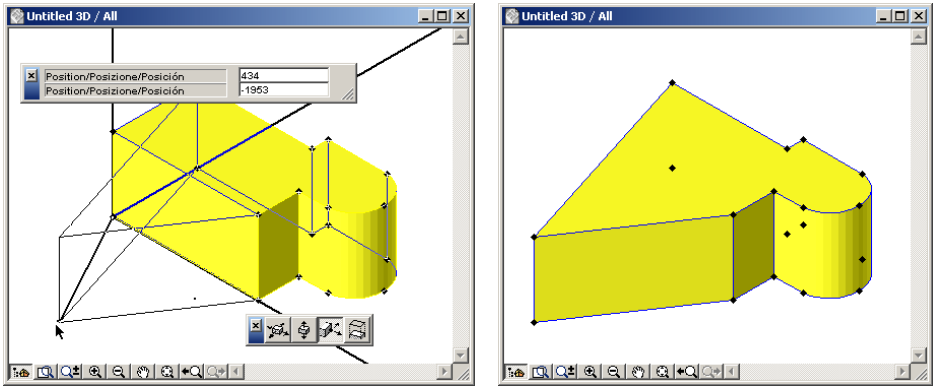
- Modification of the development angle.



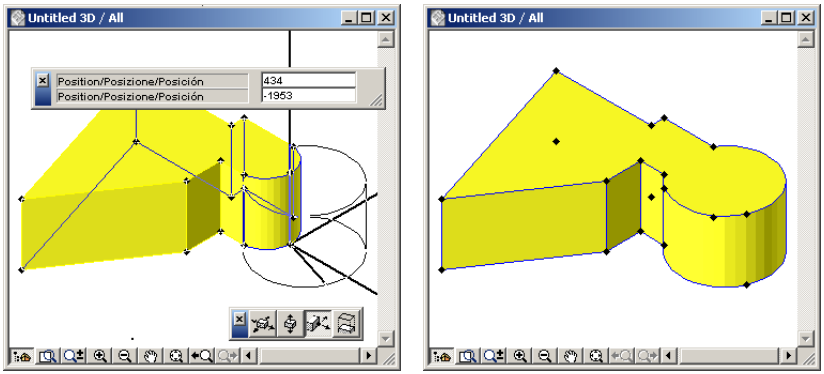
- Modification of the length of a side.



- Modification of the position of a node (in the 3D window):



- Modification of a curved side (in the 3D window):



Modification by using the "Edit mode" tool

Through the different working phases, it may occur that you perform several operations on the ArchiForma elements (rotations, holes, cuts) which could make their editing on the Plan very complex if you use the two previous techniques.

For example, if the element has been rotated in the space, modifying its nodes position using the graphic editing techniques of the intelligent editable hotspots could be almost complex, as the editing plane displayed by the ArchiCAD Plan window is obviously the horizontal one of the plane itself, while the hotspots to be edited lay on a plane which may have a different inclination.

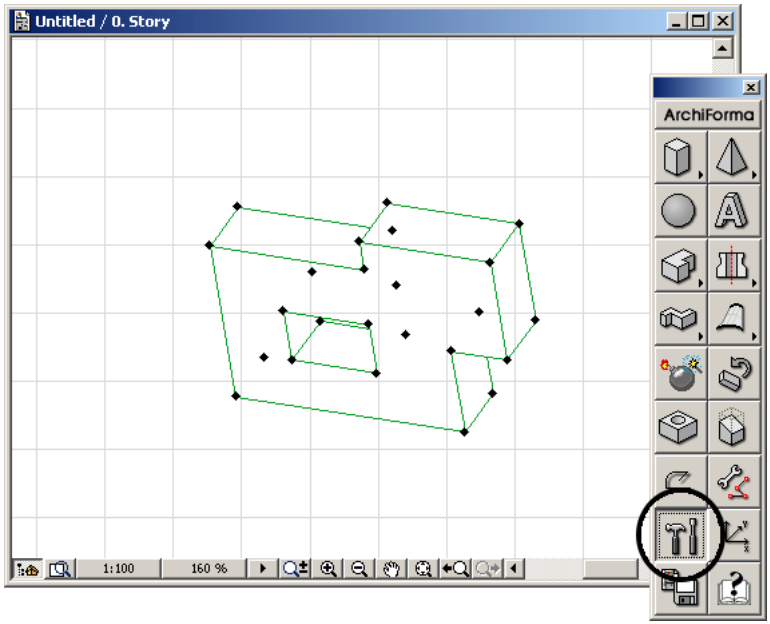
The "Edit mode" tool helps you in all these cases.

By selecting an ArchiForma element and then clicking on the "Edit mode" tool icon, you will always display a special view of the element, which includes either its Plan view (as if the element had not been rotated) or its front view.

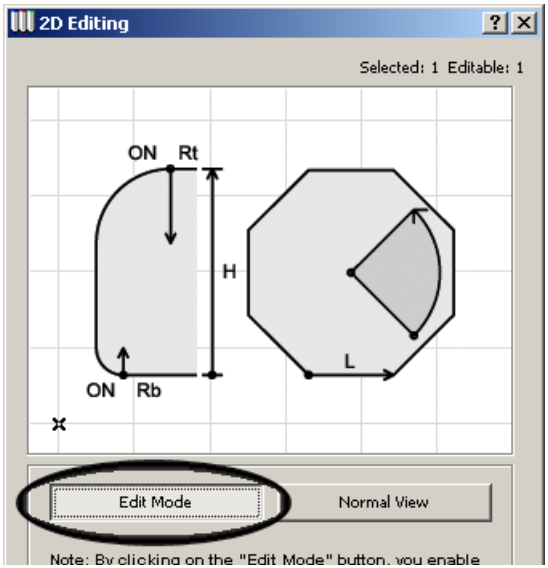
By using the editable hotspots available with this view, it will be easier to modify the parameters/geometry of the element (nodes positions, sides length, heights, development angle, rounding of the upper and bottom sides, etc.).

Once you completed the modification, click again on the "Edit mode" tool icon to restore the original view of the element.

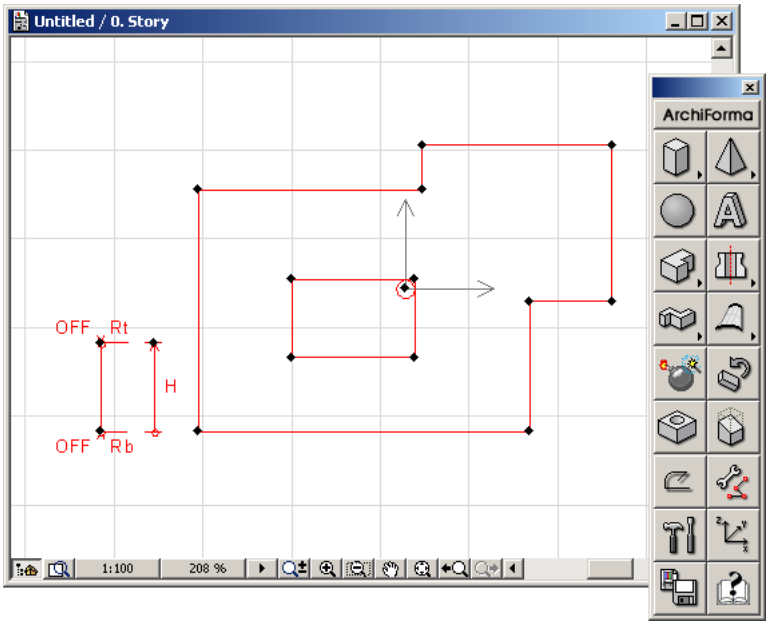
Let's see a simple example with a Simple Vertical Extrusion element which has been rotated in the space.



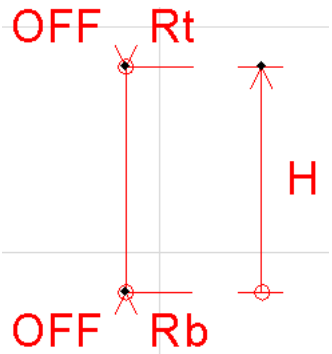
Once you have selected the element and clicked on the "Edit mode" tool, ArchiForma will display a dialog window where you can enable the "Edit mode" visualization.



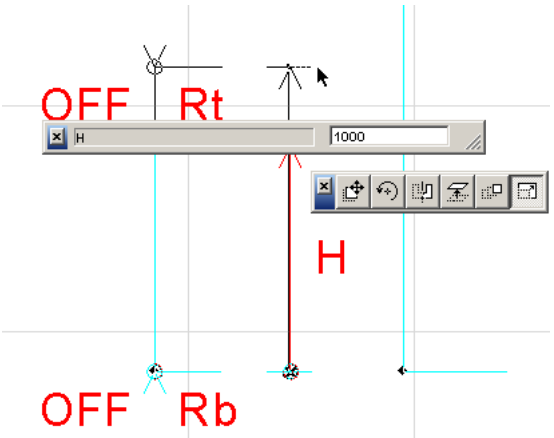
Click on the button Edit Mode and ArchiForma will enable this "special" visualization mode.



On the left, a diagram will be displayed, showing the front view of the element.



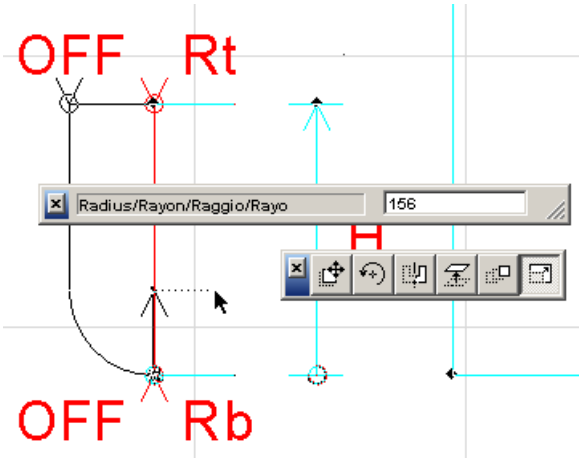
If you drag the editable hotspot to the end of the vector identified by the letter H, you can modify the height of the element (even numerically if you enter the required value in the corresponding parameter input field).

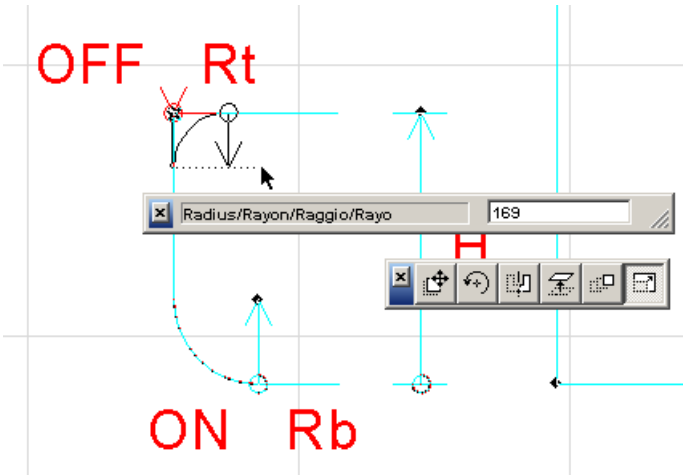


On the left of the height vector, with the other two editable hotspots (identified by "Rt" and "Rb") you can enter the rounding value of the two bases of the element.

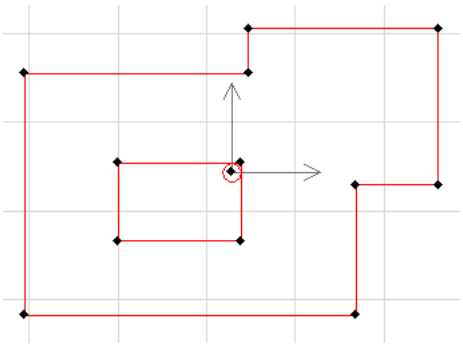
The intelligent hotspots "acknowledge" the geometrical limits of the element shape so that you will not be able to define graphically the inappropriate rounding values.

To cancel a rounding value, you simply have to drag the hotspot to the outside of the profile (upwards for rounding the top, downwards for rounding the bottom section) and the value will be automatically set to zero.

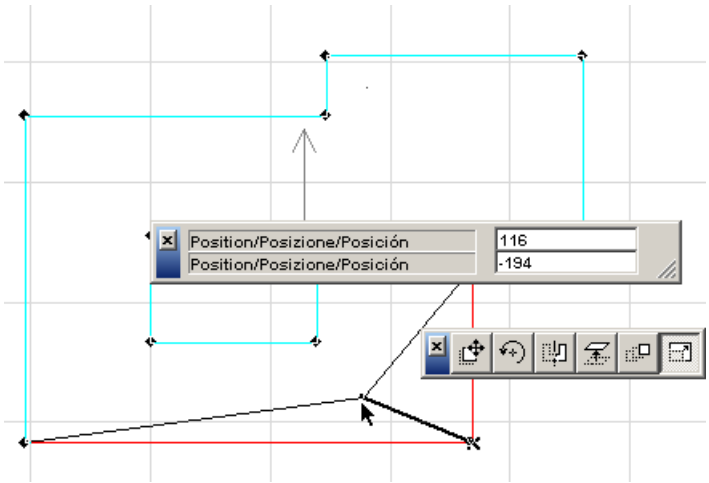


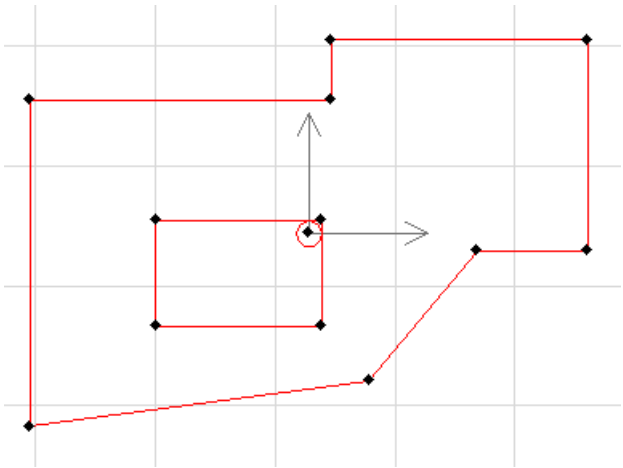


On the right side of the symbol, a diagram representing the plan of the element will be displayed.



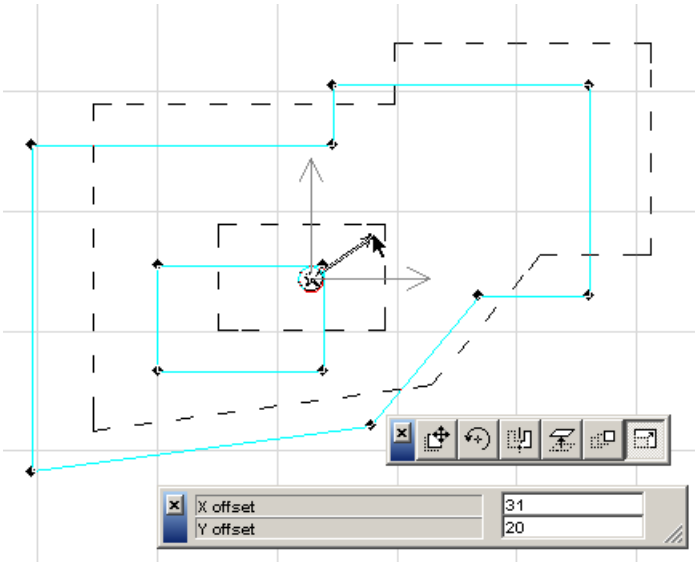
For each node of the element (both in the perimeter nodes and in the nodes inside the holes) there is an editable hotspot allowing you to set graphically or numerically (if you enter the desired value in the corresponding input field of the parameter) the position of the node or the side length.





In the center of the shape plan, another editable hotspot, surrounded by a two-axis circle, allows you to define the shift value between the two sides (upper and lower) of the shape.

Even in this case, drag the hotspot to the desired position (or enter the desired value in the corresponding input field of the parameter) in order to define the value of this translation.



As soon as you have completed the modifications to your element, select it and click again on the ArchiForma “Edit mode” tool.

Click on the button “Normal view” and ArchiForma will restore the “standard” visualization mode of the element on the Plan.