Creating a Fixed-Sized Box from Components

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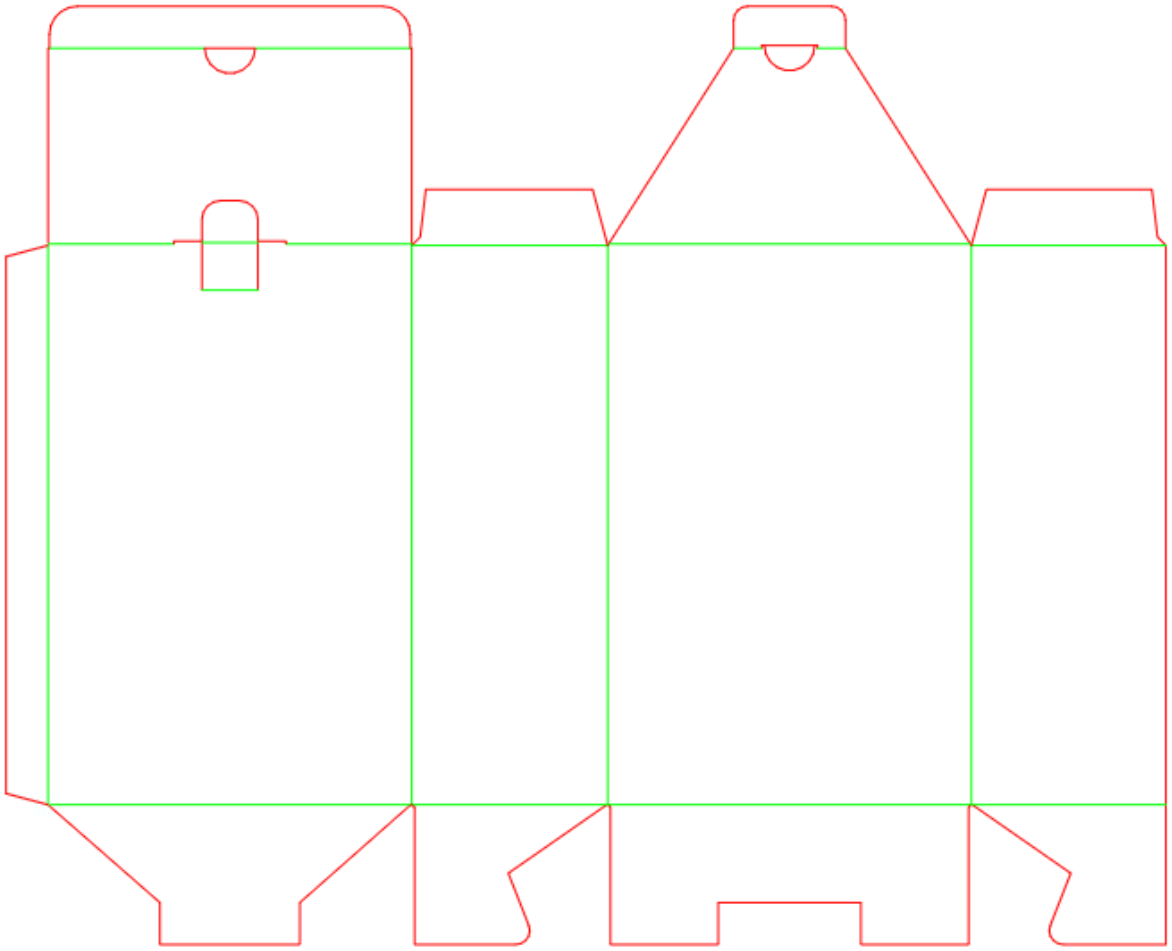
Task

In this exercise you will learn how to make a new design from components.

Length	130 mm
Width	60 mm
Height	155 mm

Complete folding box



Exercise Description

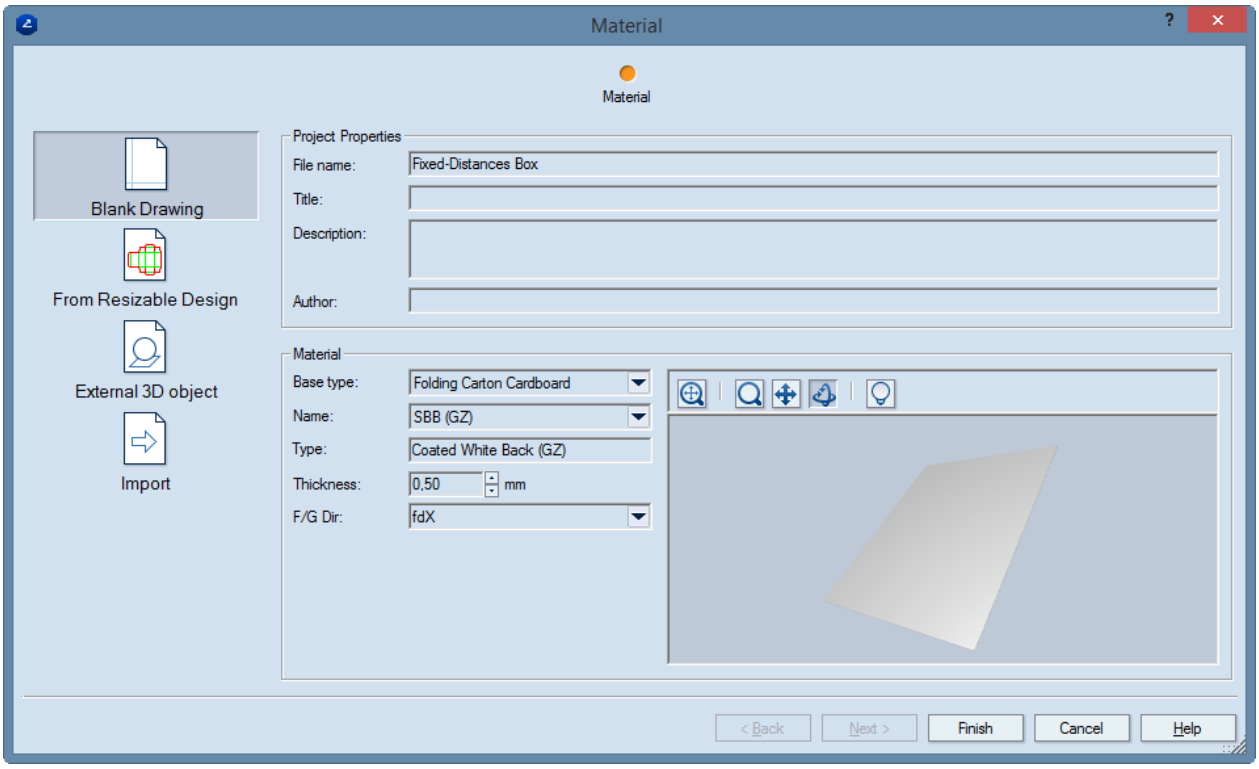
Prerequisites

1. On the **Tools** menu, click **Options**, and then click the **Synergy** tab.
2. In the Show area, leave empty the **Advanced parameters matching** check box.

Preparation

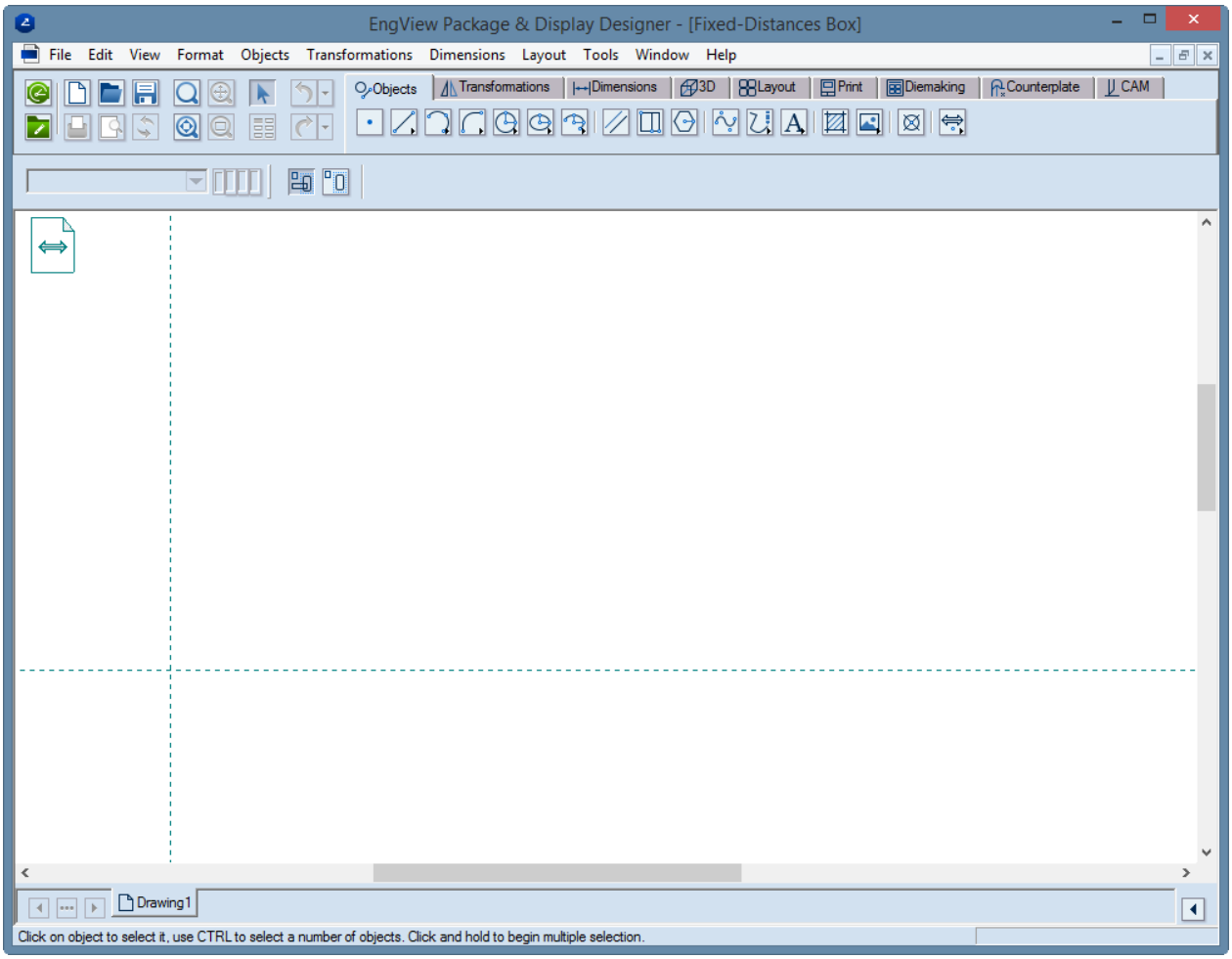
1. To create a new file, do any of the following:
   - On the **File** menu, click **New**.
   - In the toolbar, click the **New Project**  .

     The **Material** dialog box appears.
2. In **Base type**, select Folding Carton Cardboard.



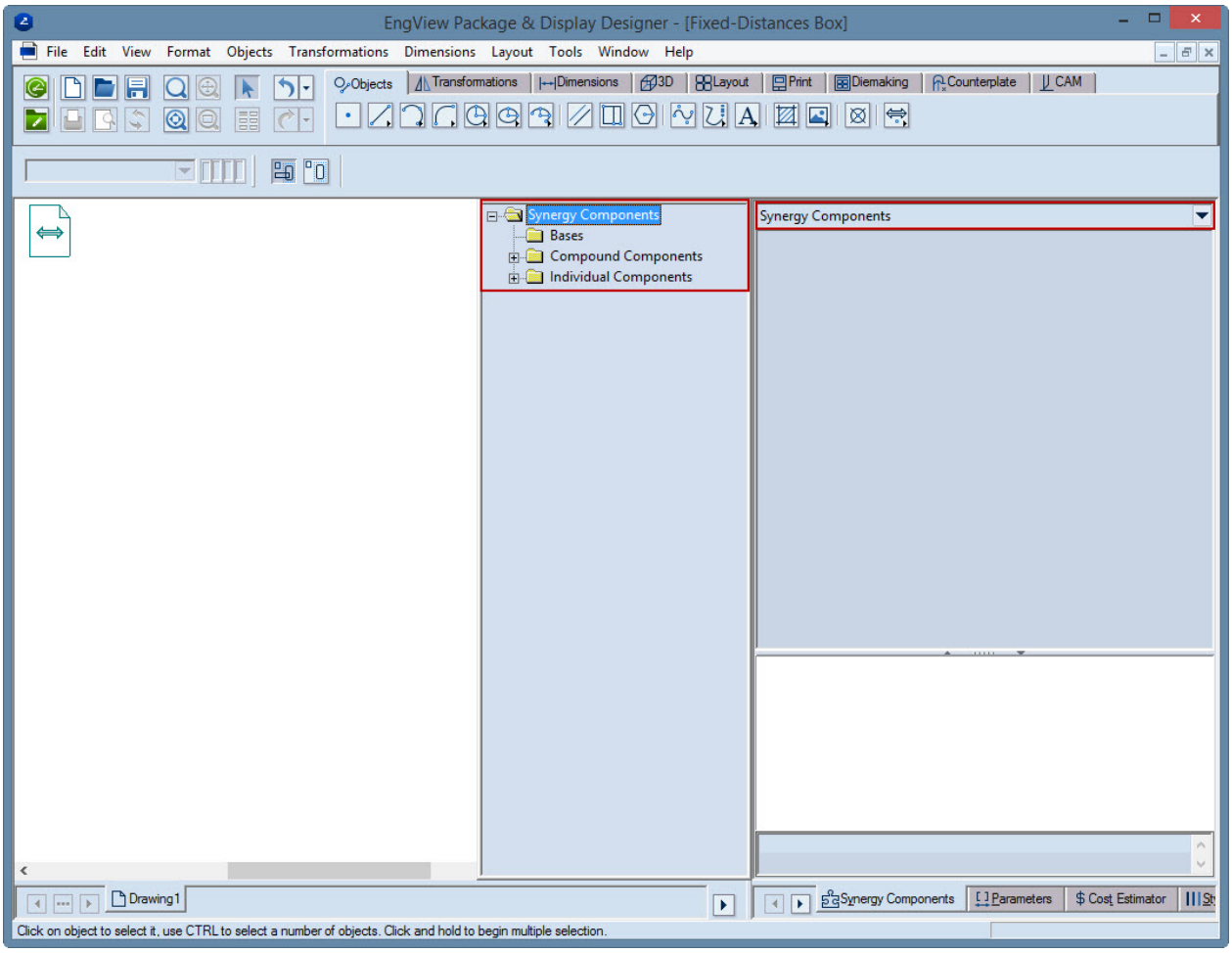
3. Create a new blank drawing, click **Blank Drawing**, and then click **Finish.**
4. Double-click the title bar of the new project to fit the window to the size of the program.
5. To show the tabular area, do any of the following:
   - On the **View** menu, click **Tables**.

- In the lower right corner, click the Show/Hide button  .



6. In the tabular area, click the **Synergy Components** tab, and then click the **Synergy Components** folder.

   We see the subfolders.


EngView Package & Display Designer - [Fixed-Distances Box]
File Edit View Format Objects Transformations Dimensions Layout Tools Window Help
Objects
Transformations
Dimensions
3D
Layout
Print
Diemaking
Counterplate
CAM
Synergy Components
Bases
Compound Components
Individual Components
Synergy Components
Drawing1
Synergy Components
Parameters
$ Cost Estimator
Click on object to select it, use CTRL to select a number of objects. Click and hold to begin multiple selection.

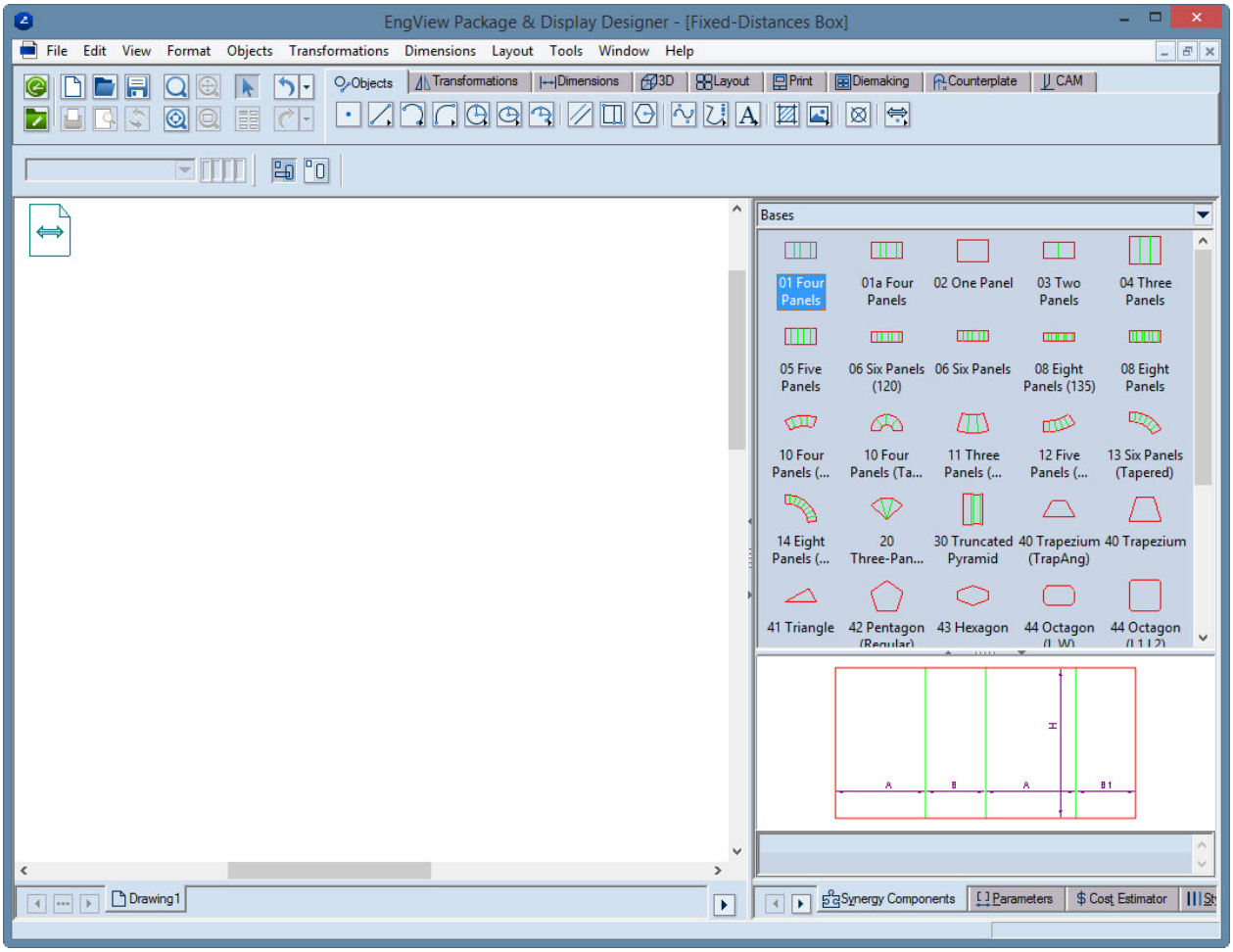
Positioning the Base

1. To position the base element, click the **Bases** folder.

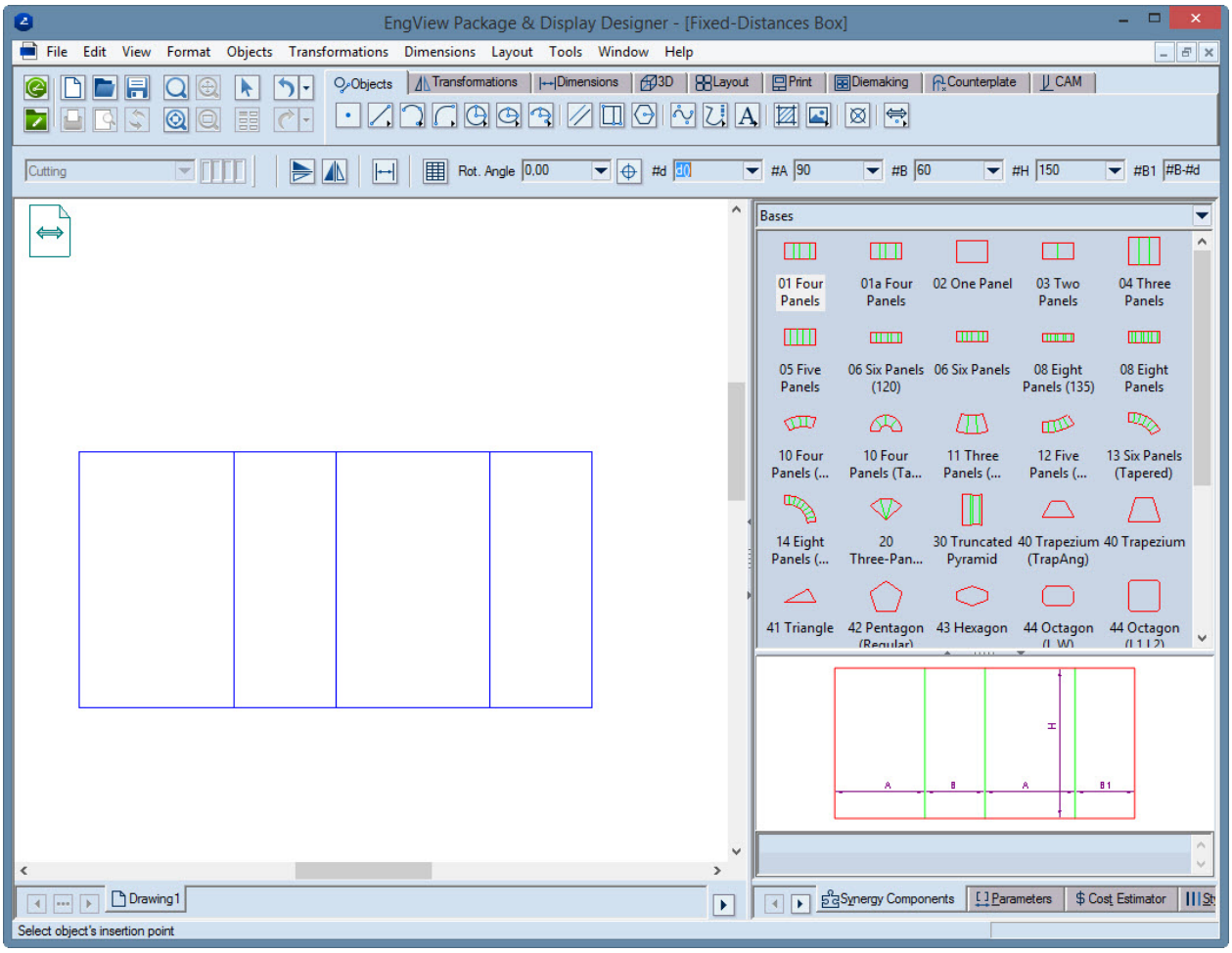
A list preview of all available bases appears.

2. Select the component 01 Four Panels.

A preview of the base appears in the tabular area below the component list.

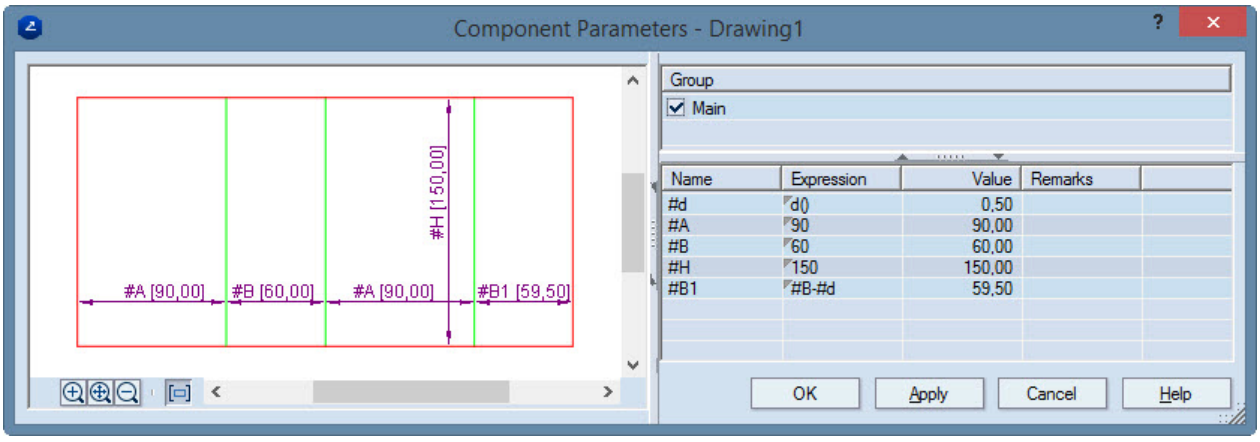


3. Drag the component into the graphical area.

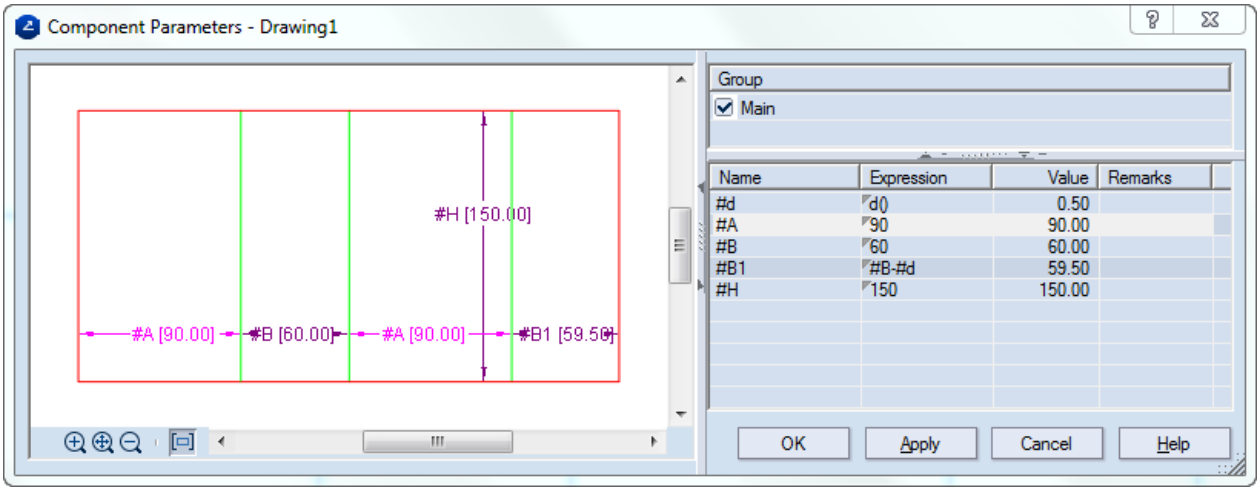


4. When you decide where to place the component, click.

The **Component Parameters** dialog box opens. In it, you can specify the values of distances of the base – #A, #B, #H.

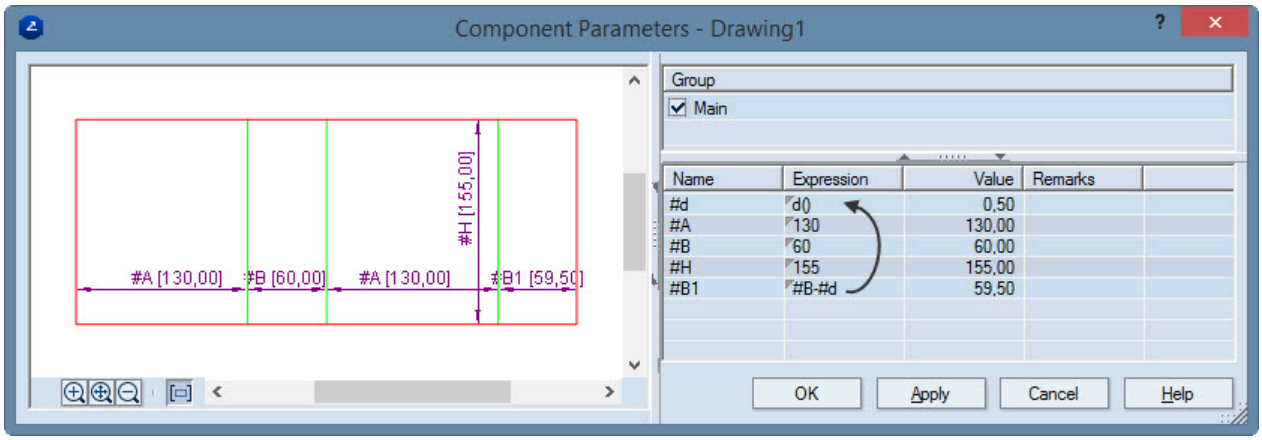


5. Edit the values of the parameters #A, #B, and #H: click their respective fields in the **Expression** column. Make #A=130; #B=60; and #H=155.



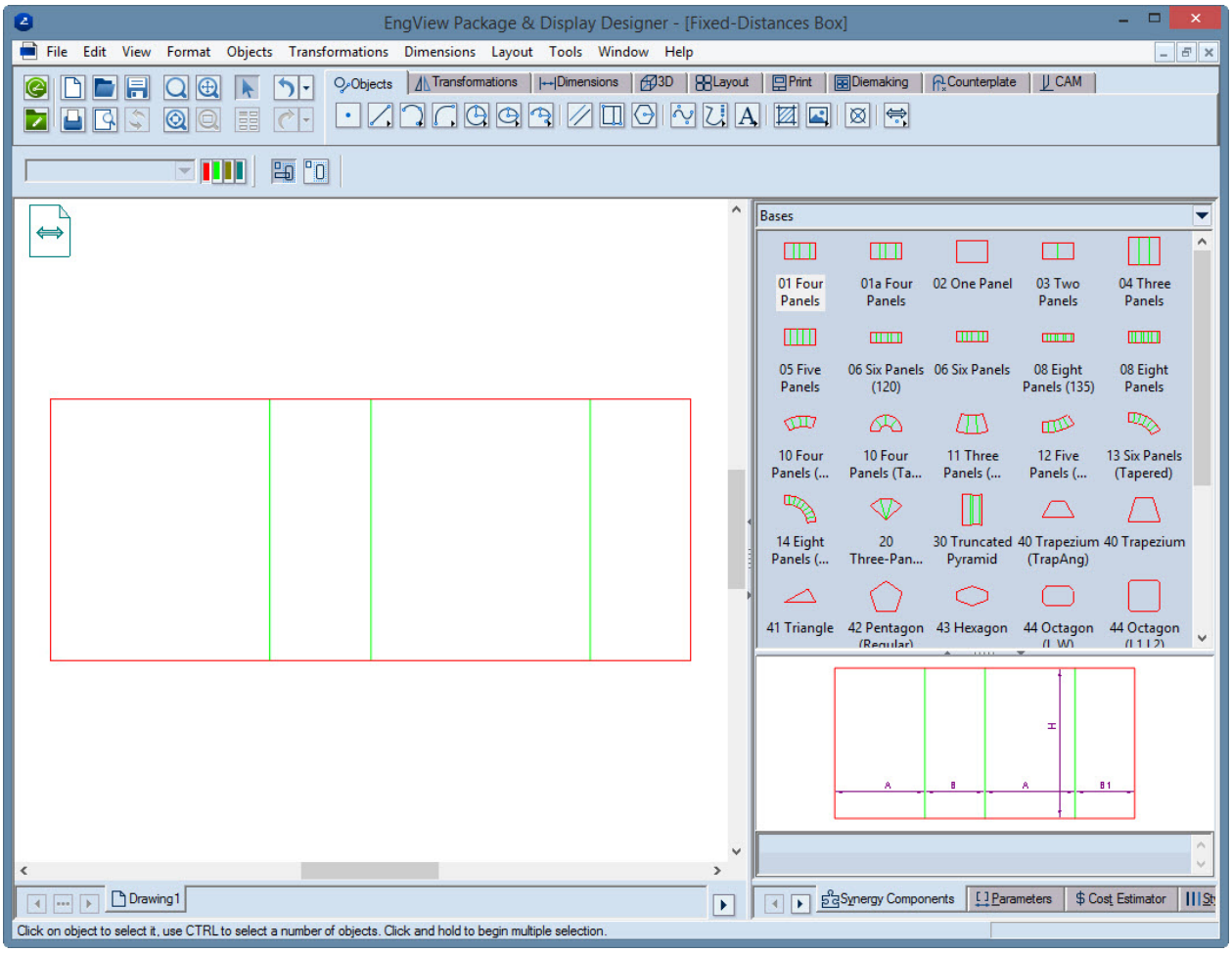
TIP: During editing, we can use the **Apply** button to see how the editing affects the drawing.

NOTE: For the #B1, the #B-#d formula is set. The reason is that the glue flap is supposed to be on the long side's left. Through this formula the right-hand panel is automatically shortened by the value #d. on the other hand, #d (the first row in the table) has been substituted automatically with the function d(), which extracts the thickness of the used material.



6. To apply the changed values from the table to the drawing, click **OK.**
7. To exit the mode for inserting components, press ESC.

The base is now positioned.



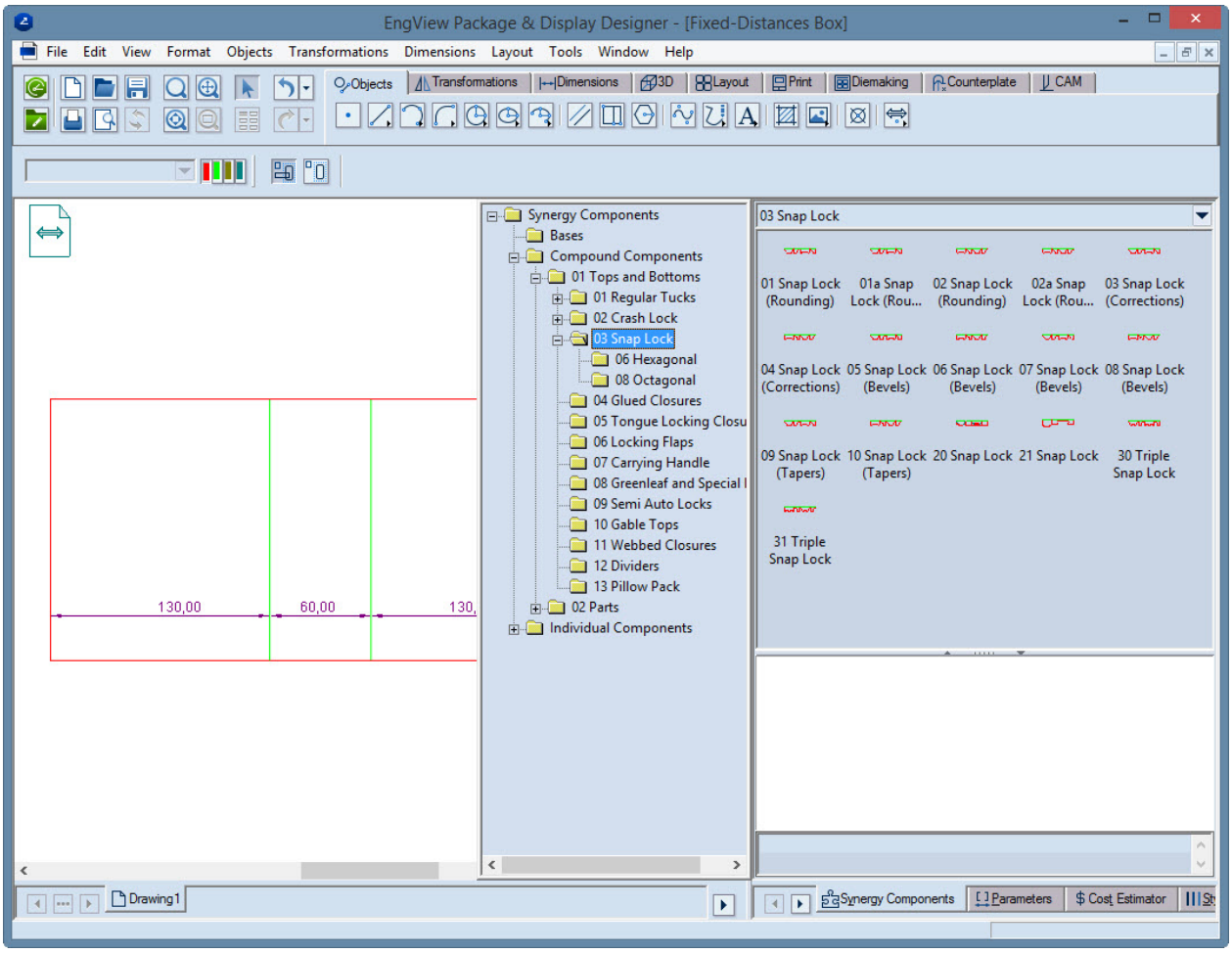
8. To make the dimension lines visible, do any of the following:

- In the graphical area, right-click the base, point to **View**, and then click **Dimensions**.
- Click the base to select it. Then on the contextual edit bar that appears above the graphical area, click **Show component dimensions**  .

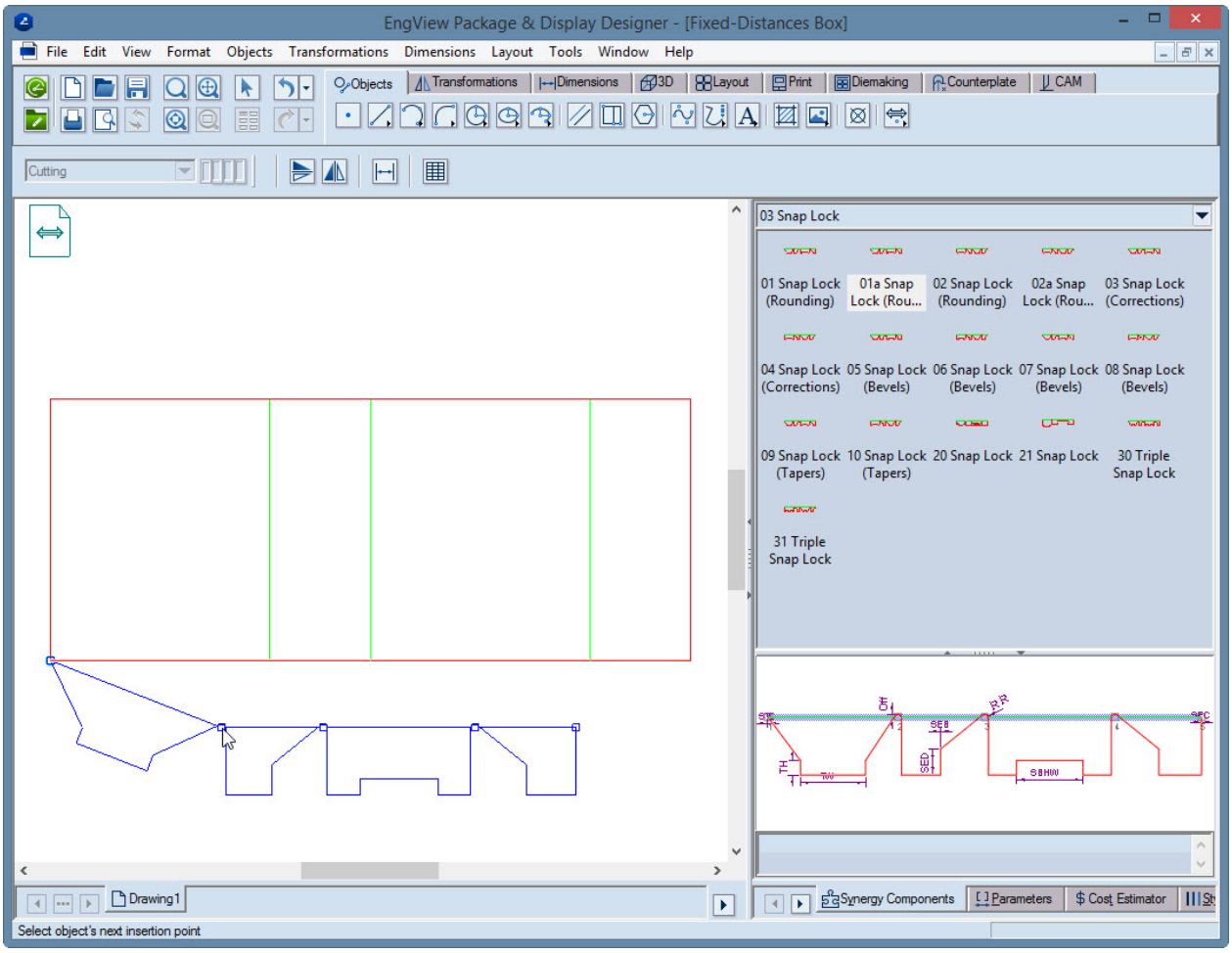
Attaching the Bottom

1. Browse the sequence: Compound Components | 01 Tops and Bottoms | 03 Snap Lock.

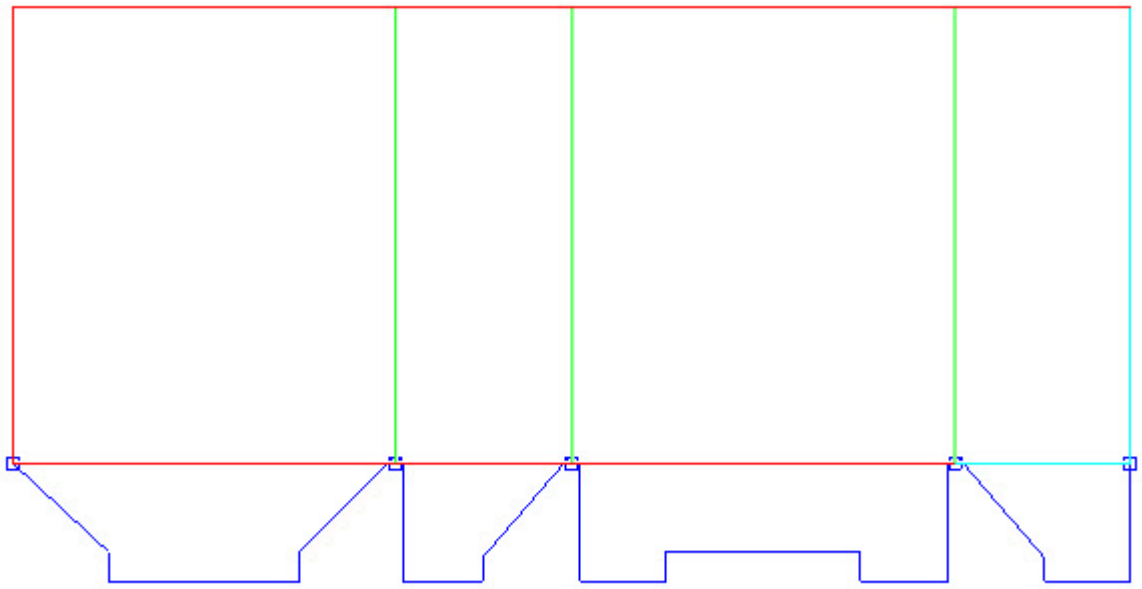
The program lists the components in the selected folder.



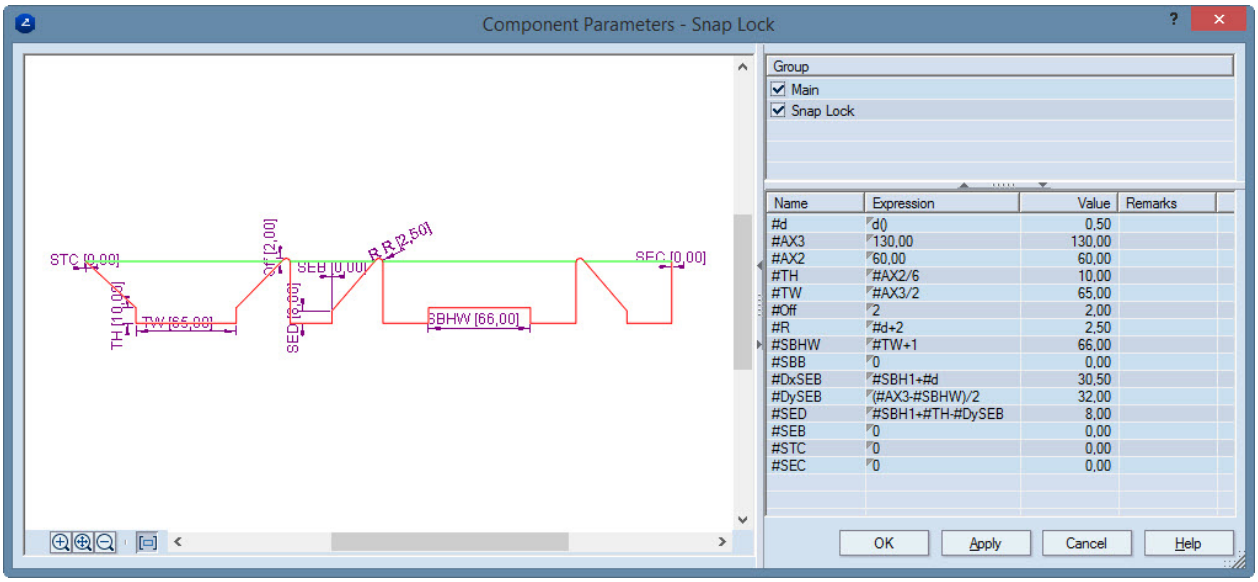
2. Select the component 01a Snap Lock (Rounding.STC.SEC), and then drag it into the graphical area.
3. Start attaching the snap lock to the base from left to right: Position the first active point of the compound component on the first point of the base, and then click to attach the first panel of the compound (pictured).



4. Position the second active point on the first folding line, and then click to attach the point.
5. Attach the rest of the active points in the same way.



After you have attached the last point of the component, the **Component Parameters** dialog box appears.



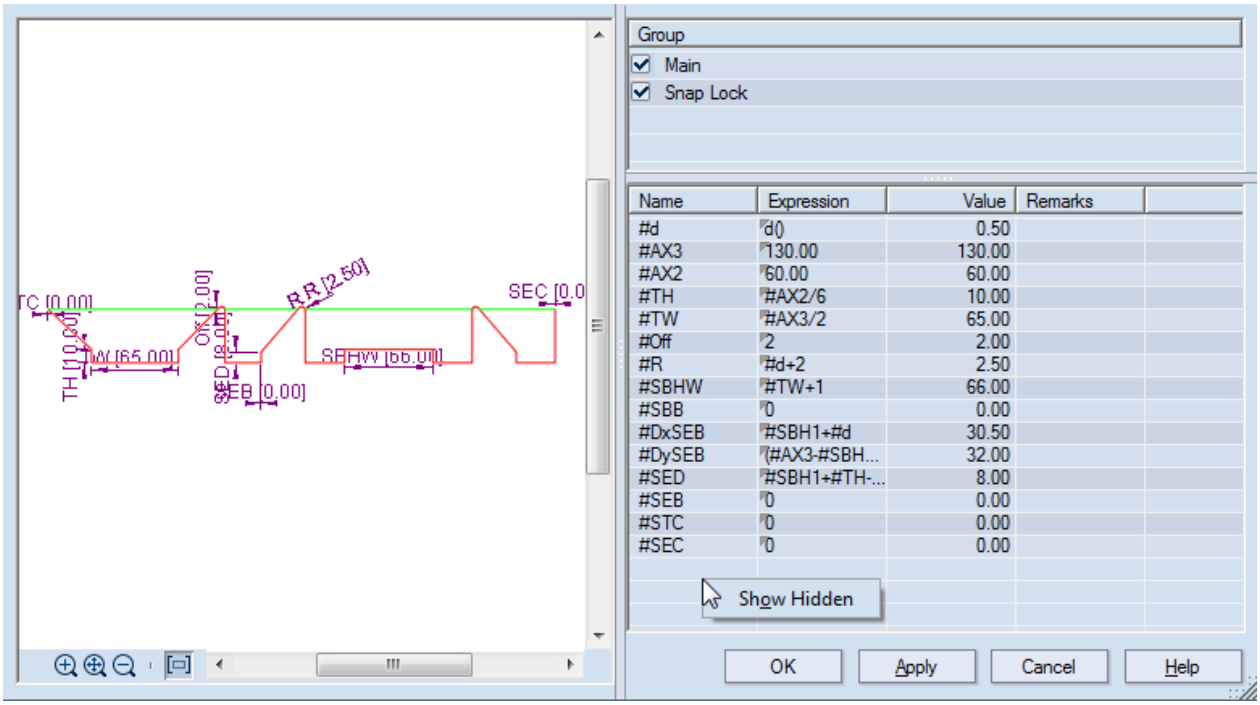
The bottom has been recomputed with regard to the base it was attached to. This was the result because the AX2 and AX3 values are automatically extracted from the values of the base.

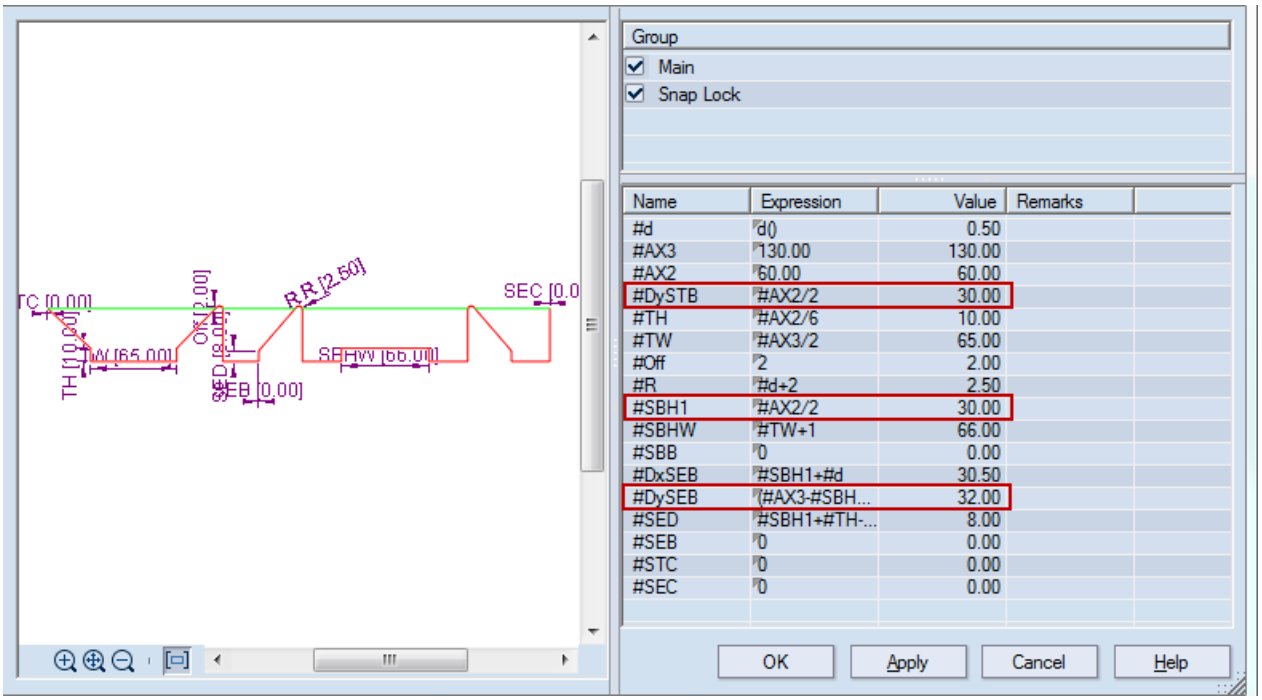
NOTE: During the assembly of a resizable design, compound components are attached to the base by their active control points. The distance between these control points are linked to the parameters AX1, AX2, AX3, and so on, depending on the number of control points in the compound component. During the attachment of the compound component, the distance between the first and the second control

points is entered as a value in AX1 if there is such a parameter in the compound component. The distance between the second and the third control points in AX2, and so on. In the current case, the compound that we use has two system parameters – AX2 and AX3. That is why, the values of AX2 and AX3 are automatically extracted from the size of the two middle panels of the base. (AX2 and AX3 are the distances between the second and the third clicks and between the third and the fourth clicks, respectively.)

In the current case, because the distance #DySTB depends on AX2, it will be computed correctly.

NOTE: To see #DySTB, in the tabular area, right-click, and then click **Show Hidden**.



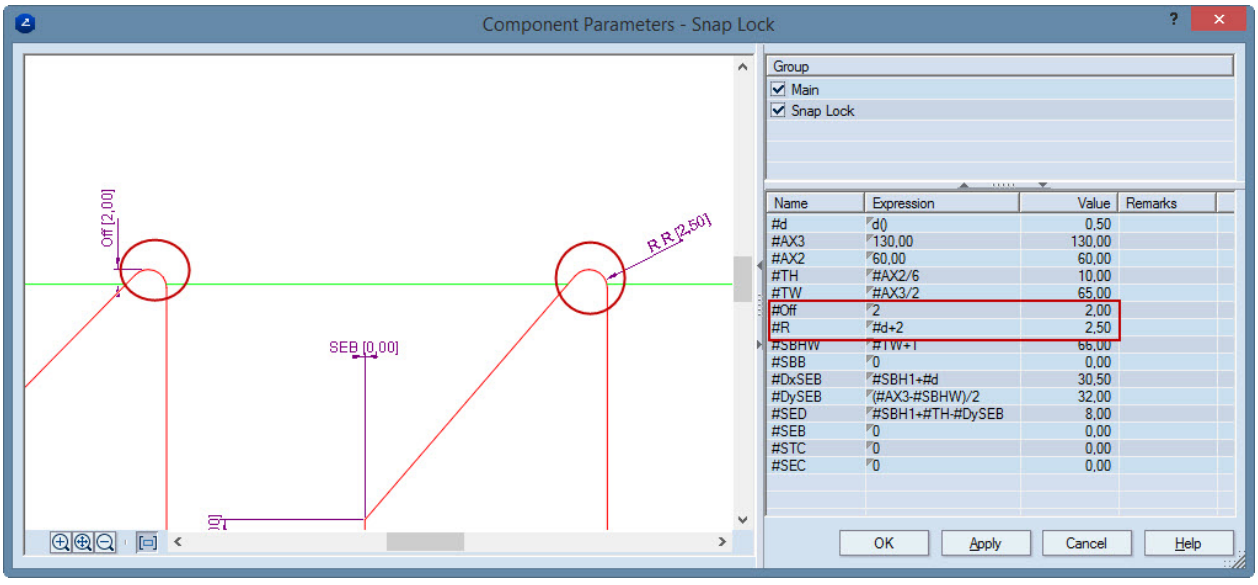


The same applies for #SBH1 and #DySEB. The formulas set for these distances are better left as they are.

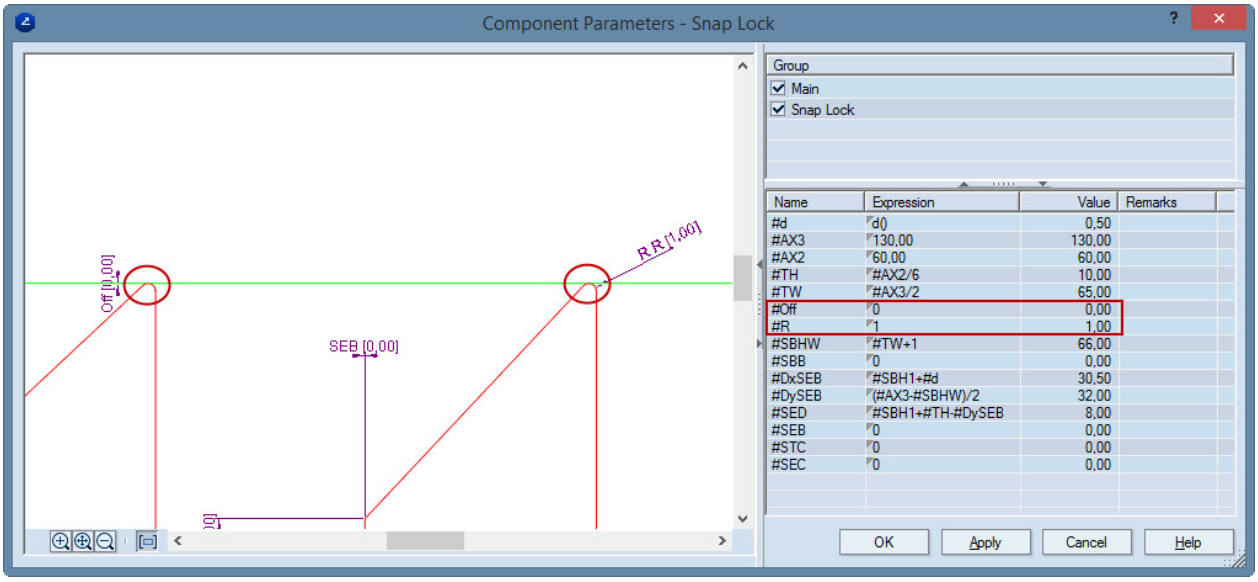
Parameters are set also for another group of distances. These however are not mandatory and can be edited. They ensure that the distances are proportional to the base to which the component is being attached. For example, one such distance is #TH.

A third group of distances have fixed values – for example, #Off and #SBB. These, too, can be edited.

Before confirming the attachment of the bottom, we can change the values of certain distances. Let us reduce the radius of the rounding. We will do this because we are working with carton and the set rounding is applied for corrugated board.



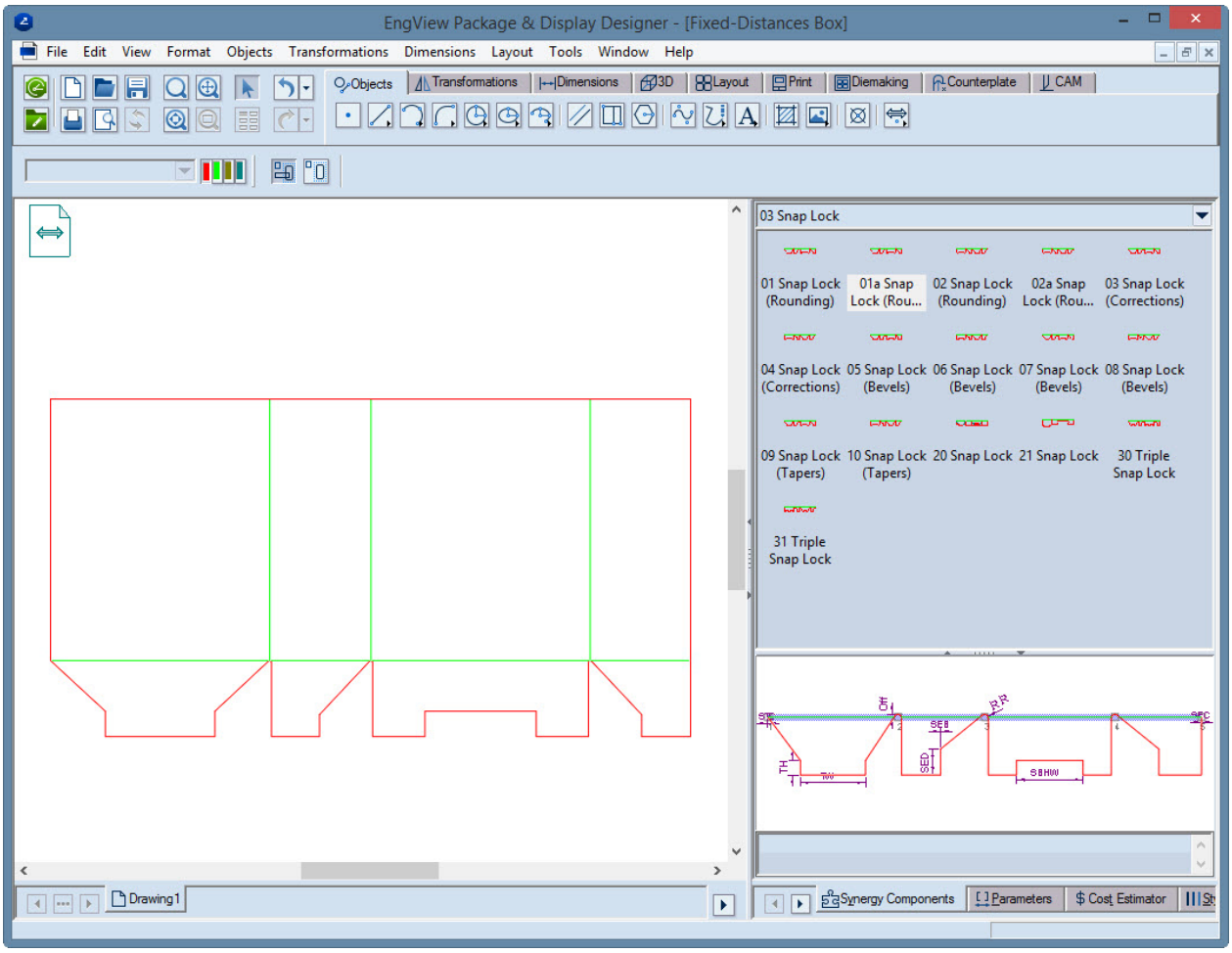
6. Make #Off=0; make #R=1.



Let's now pay attention to #TH. Due to the set formula #AX2/6, the value for this distance is 10. We will now change it.

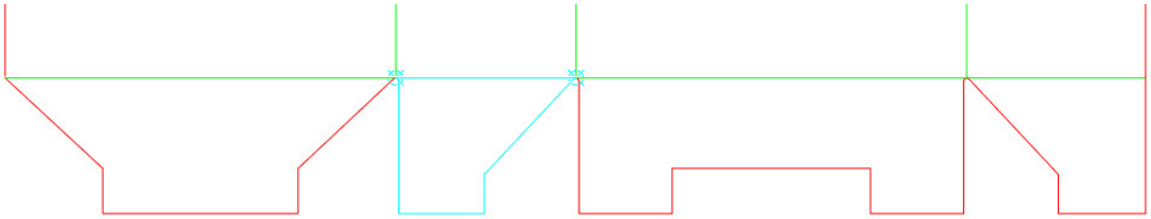
7. Make #TH=15.
8. To adopt the new values, click **OK.**

The snap lock is now part of the design:

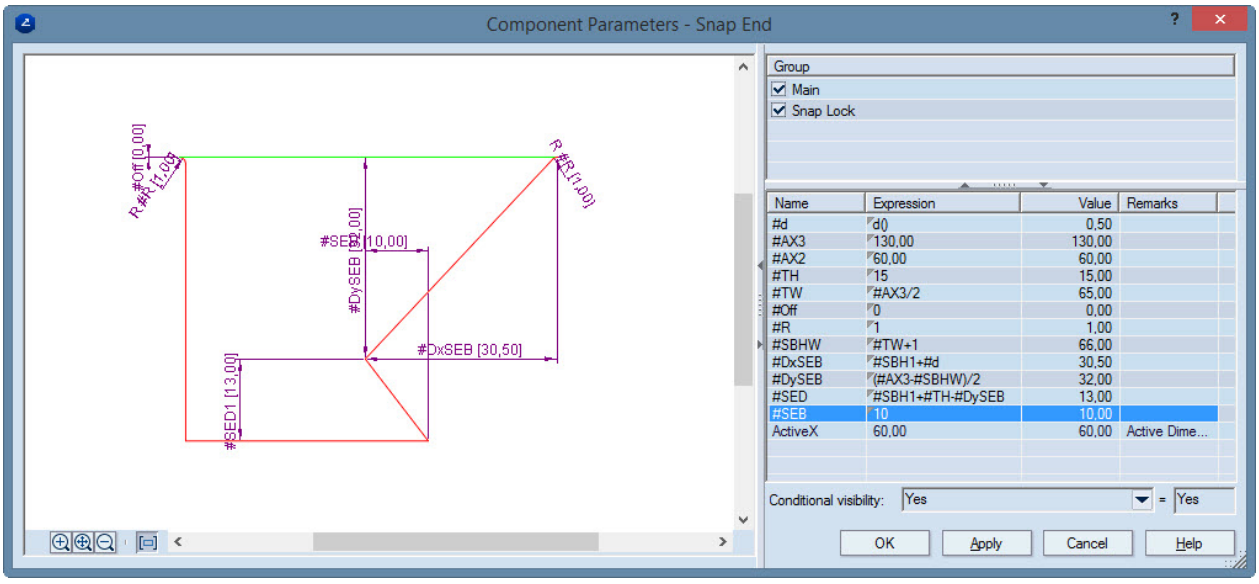


Editing can be done also after the bottom has been attached.

9. Double-click the panel as shown here.

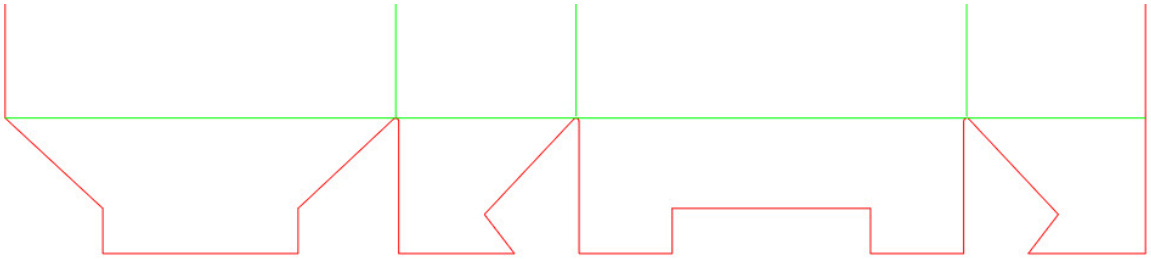


10. Make #SEB=10.



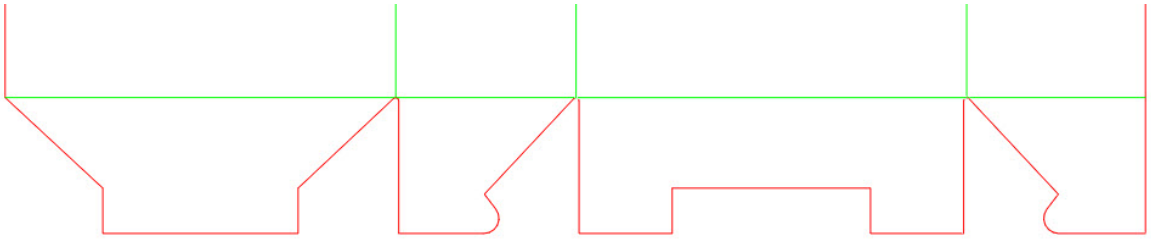
IMPORTANT: Because we are making this change after the bottom has been attached, the editing of the distance will apply only to this component.

11. Repeat Steps 9 and 10 also to the other panel.



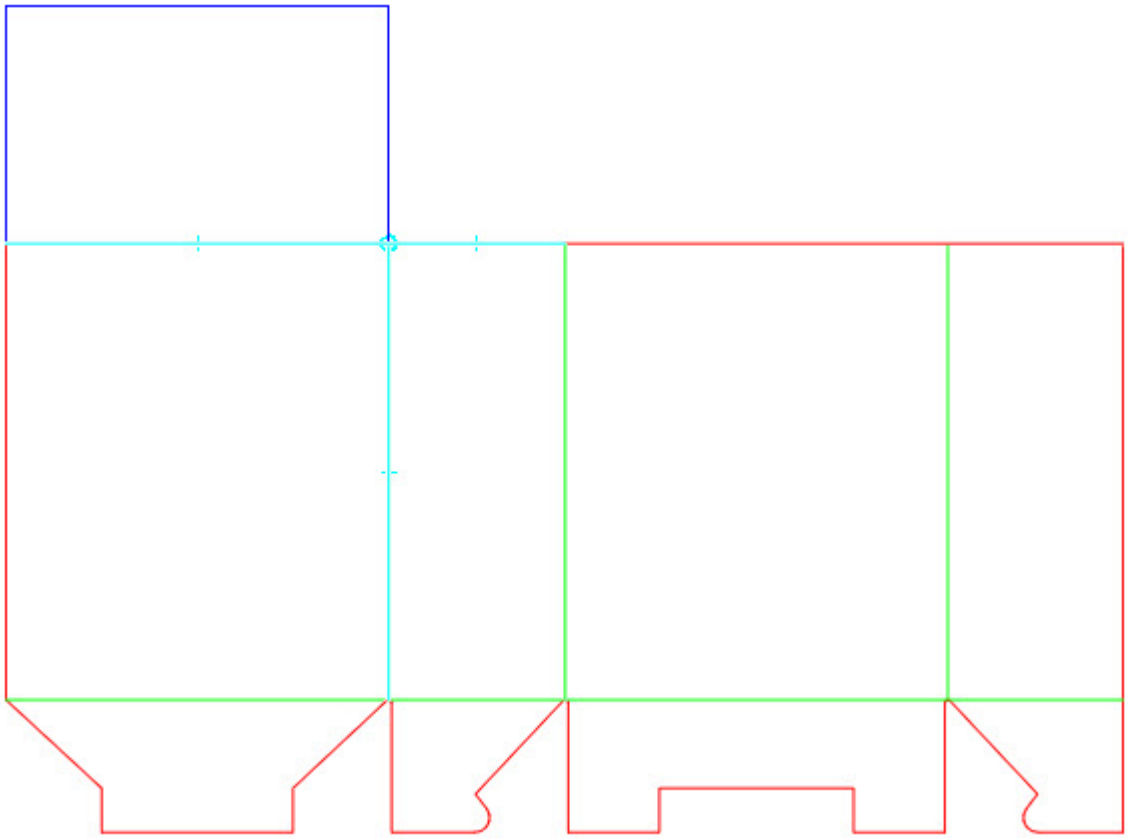
Now we will round the resultant edges.

12. On the **Objects** toolbar, click **Fillet**, and then, in **Radius**, enter 5.
13. Apply the fillet to the corners of the two panels.



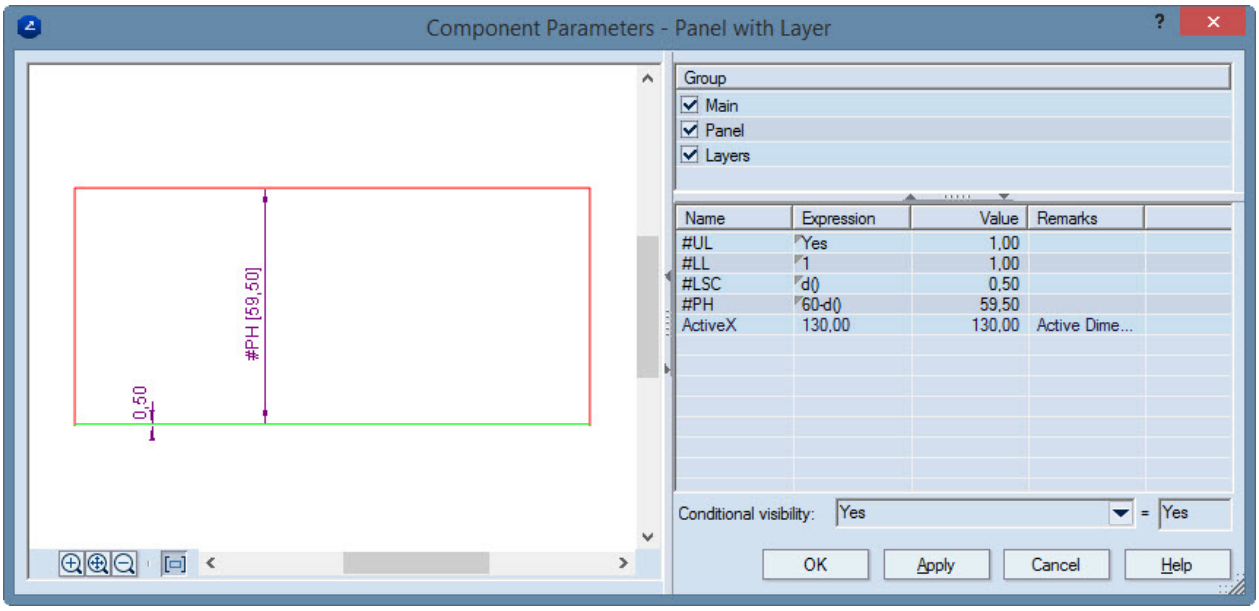
Assembling the Top of the Box

1. Browse the sequence: Individual Components | 01 Geometrical Shapes | 01 Rectangles, 01 Rectangle (Layer).
2. Drag the component into the graphical area, and then attach it (pictured).



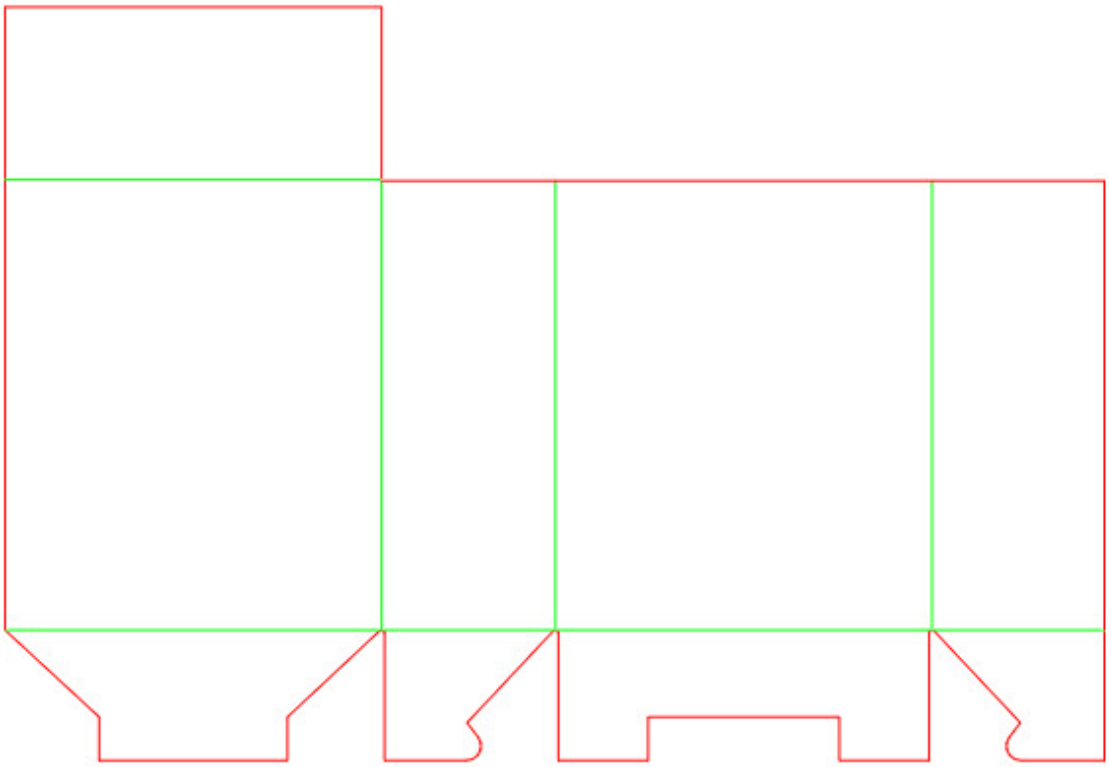
The component's parameters table appears.

3. In the table, make #PH=60-d(), and then make #LSC=d().

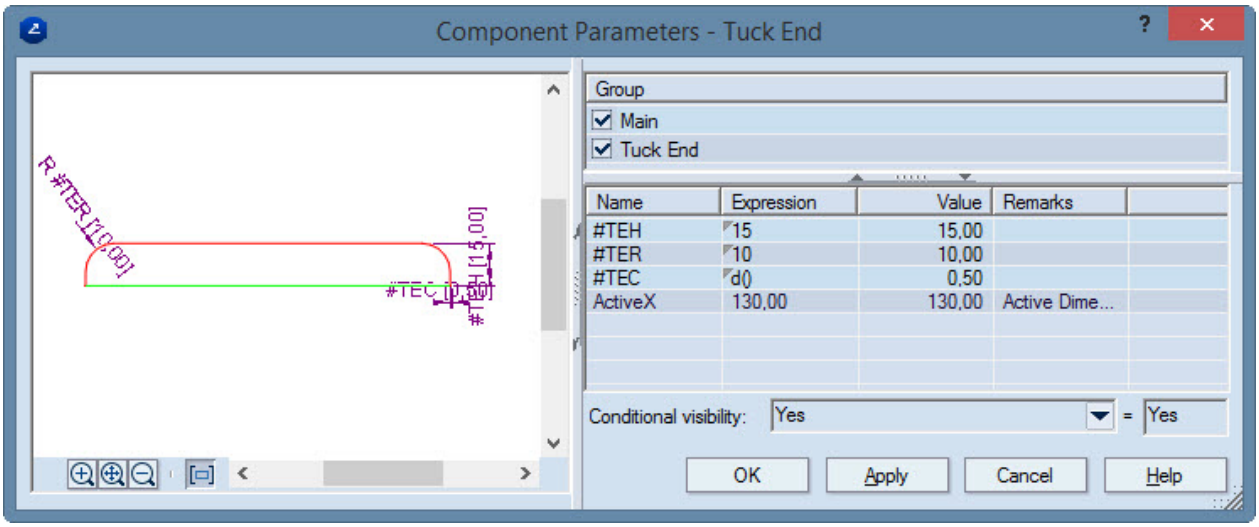


The #LSC distance moves up the crease. In this case we will use the d() function, which as we know already, extracts the material thickness. This means the crease will move by a value equal to that of the material thickness.

4. Click **OK**
5. To exit the mode for inserting components, press ESC.

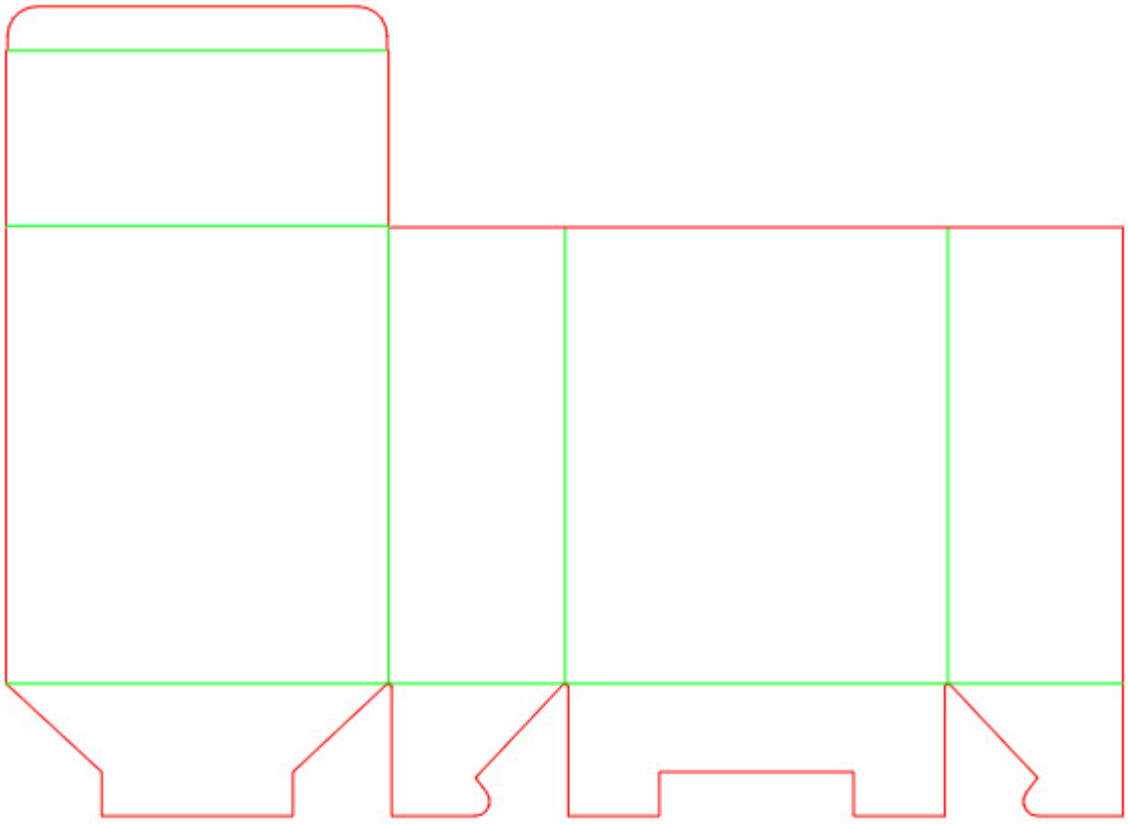


6. Browse the sequence: Individual Components | 12 Tongues | 06 Tuck Ends | 02 Tuck End.
7. On the contextual edit bar that appears above the graphical area, click **Show component dimensions**  . This will make the dimension lines of the component visible after it is attached.
8. Make #TEH=15; #TER=10; #TEC=d().

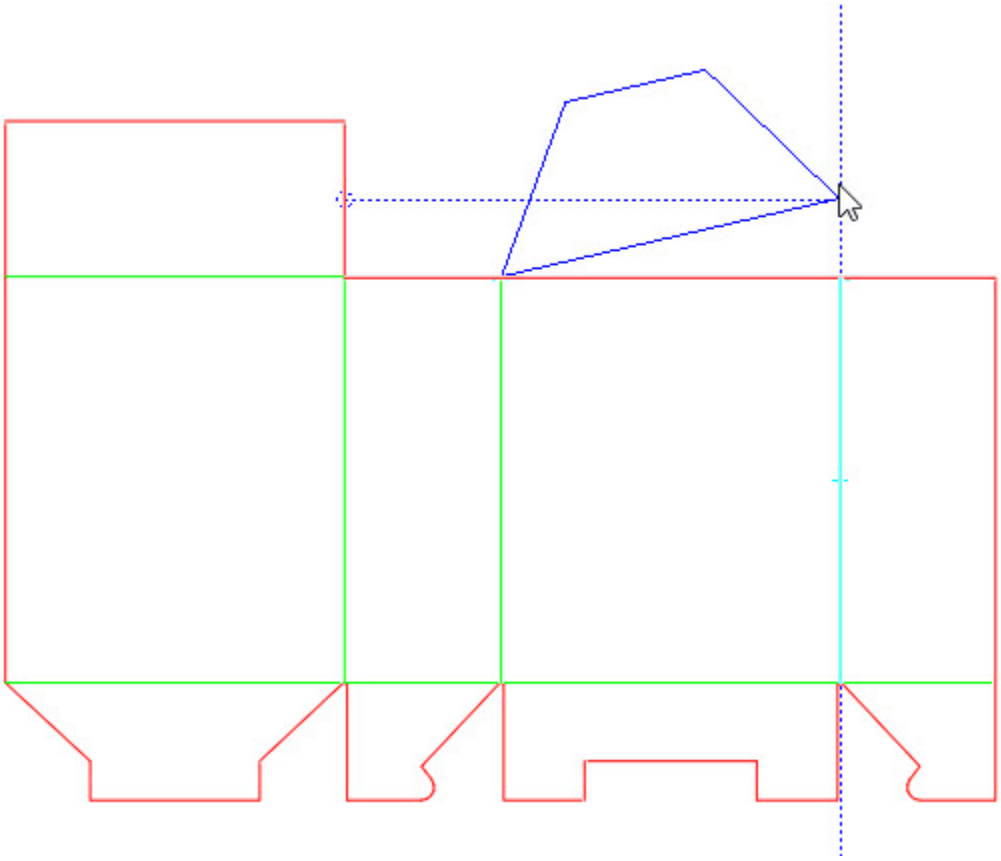


9. Click **OK**.

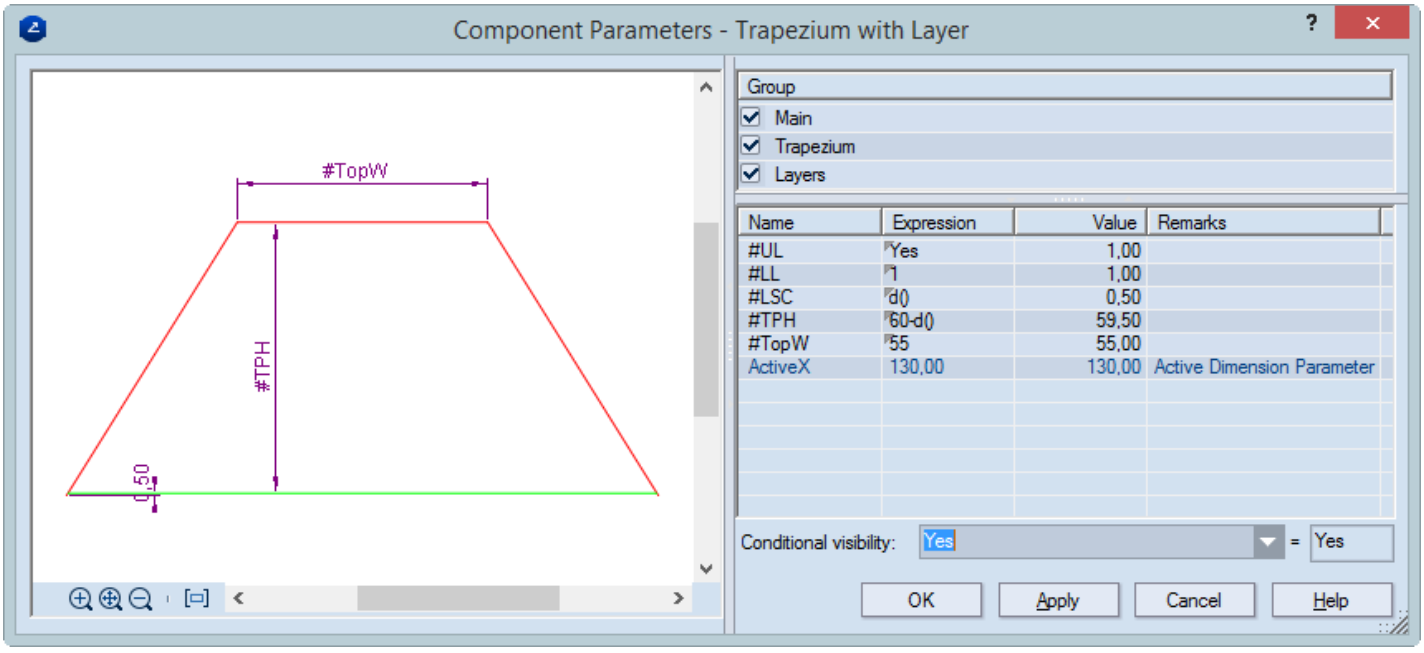
10. To exit the component-placement mode, press ESC.



11. Browse the sequence: Individual Components | 01 Geometrical Shapes | 02 Trapeziums | 01b Trapezium (TopW.Layer).
12. Drag the component into the graphical area, and attach it.

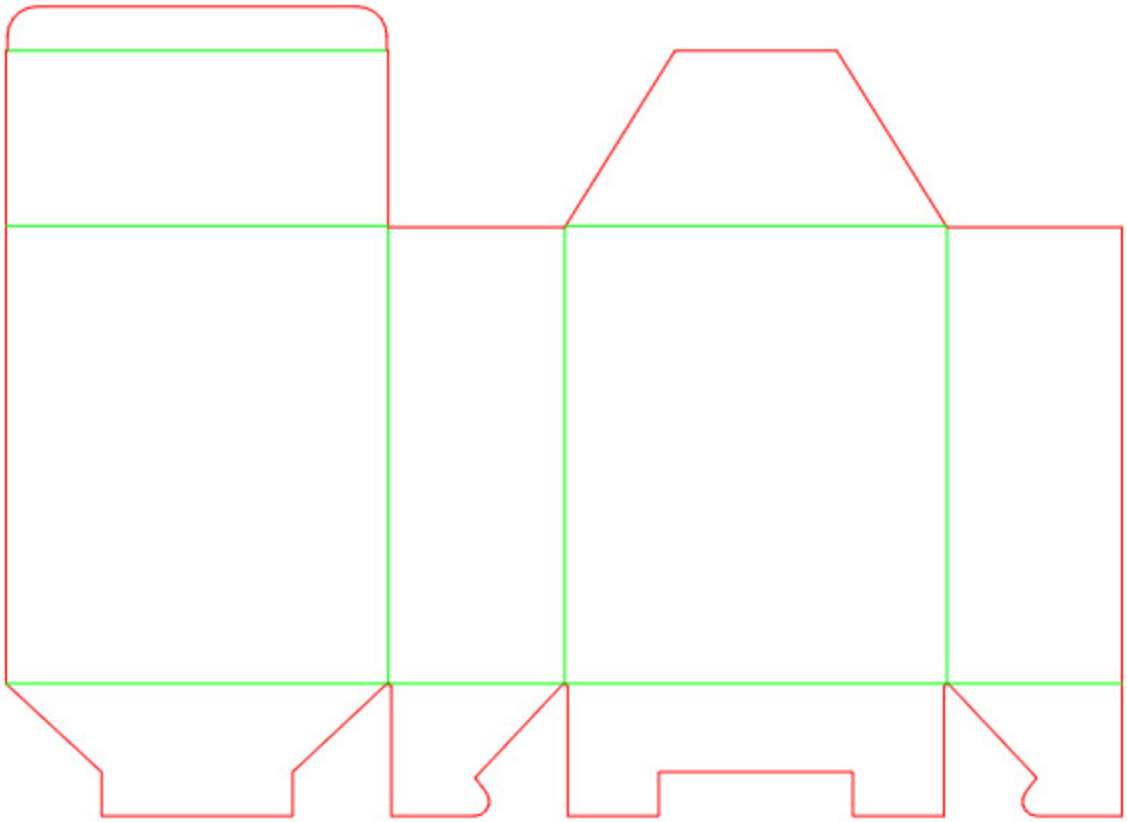


13. In the component's parameter table, make #TPH=60-d(), #LSC=d() and #TopW=55.

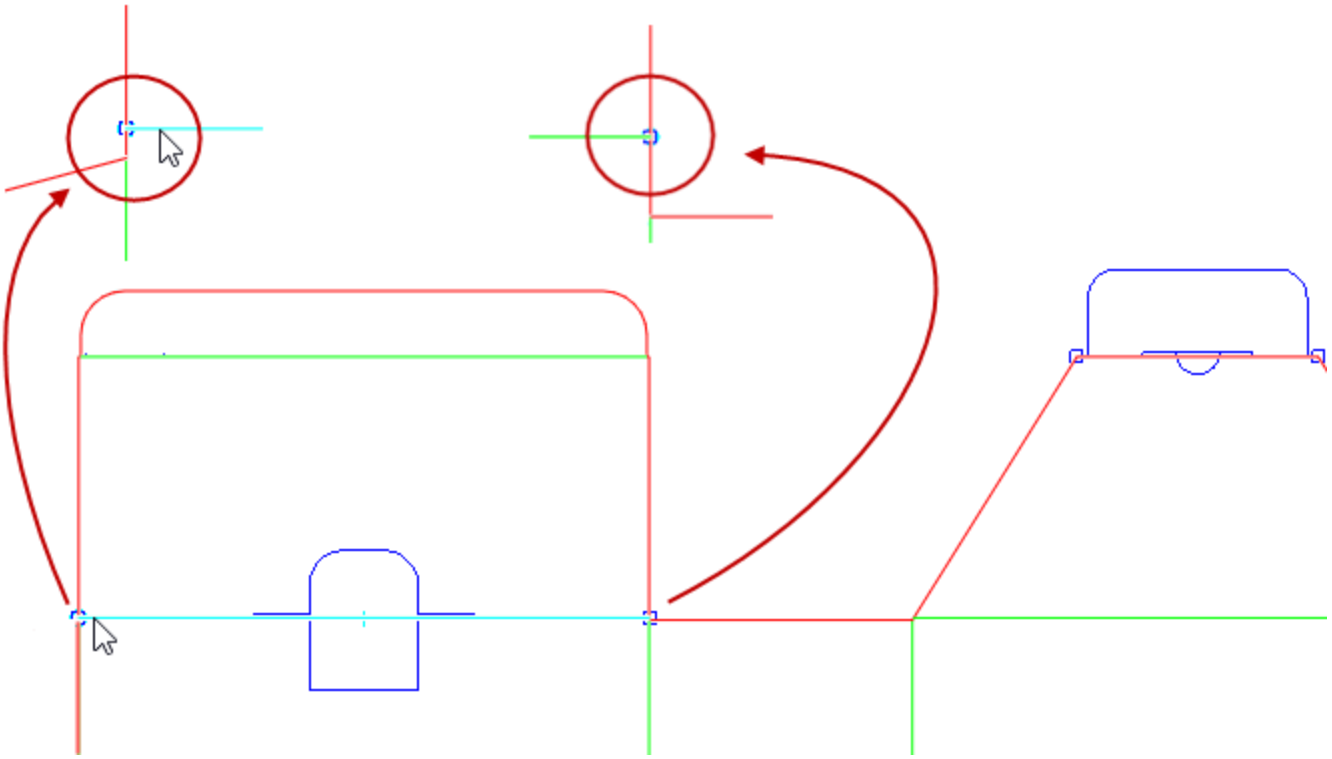


14. Click **OK**.

15. Press ESC.

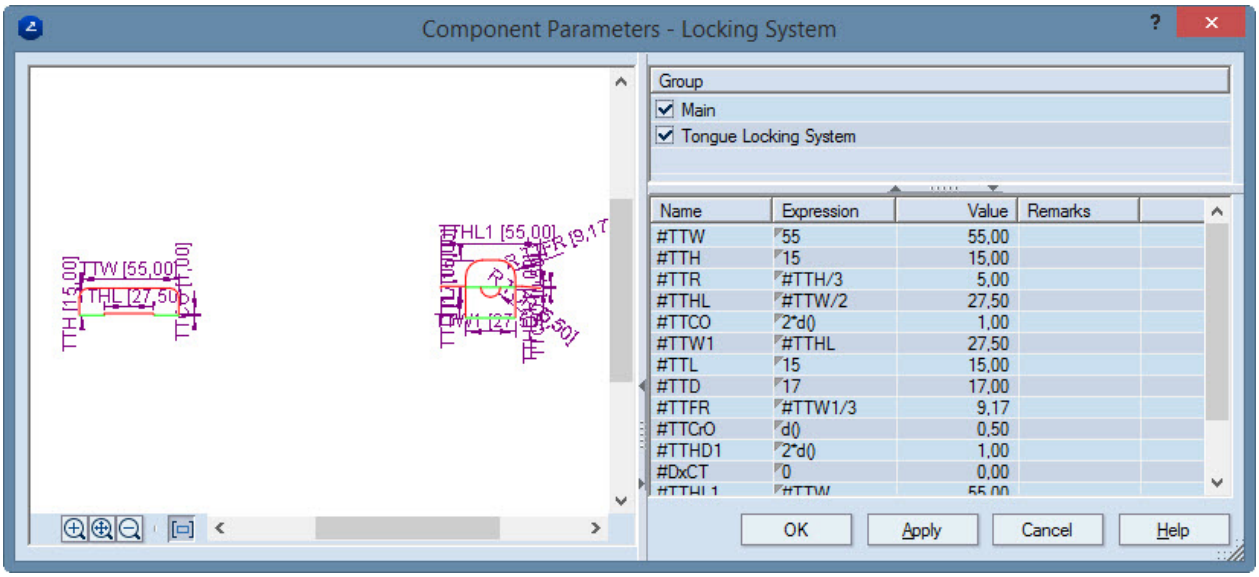


16. Browse the sequence: Compound Components | 02 Parts | 01 Tongue Locking Systems | 51 Tongue Locking System (TTCO.Centered).
17. To flip the component, on the contextual edit bar above the graphical area, click **Vertical Mirror**  .
18. Attach the component as shown in the picture below.



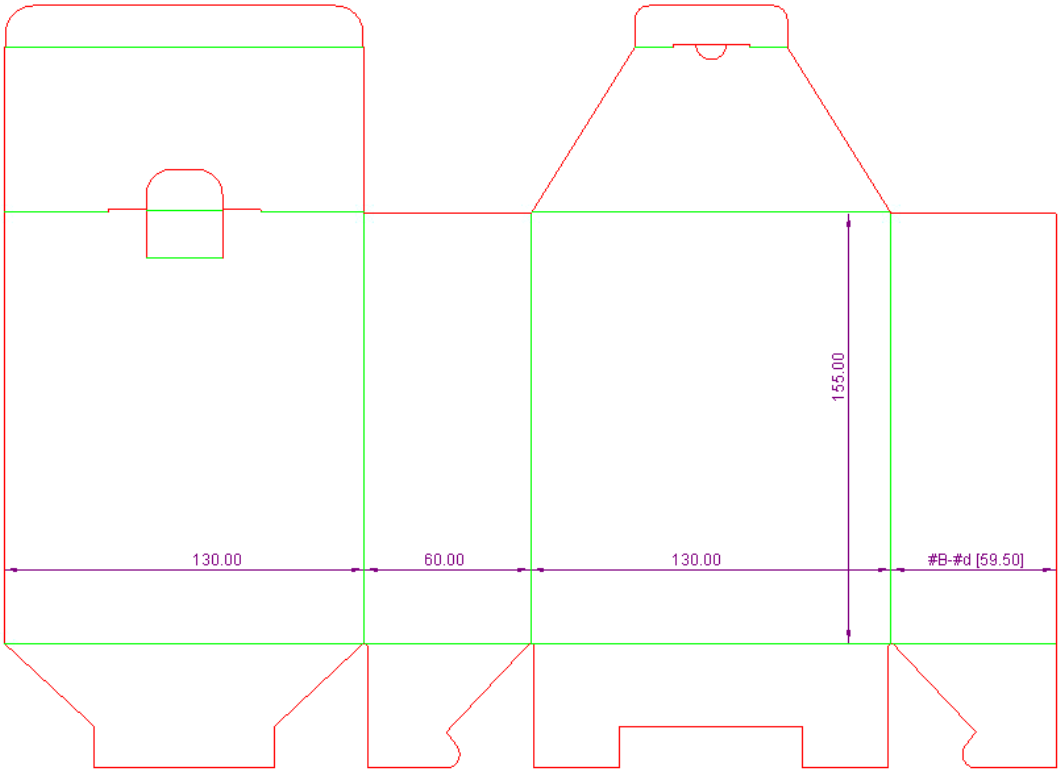
After the component has been attached, its parameters table appears.

19. In the table, make #TTW=55, and then make #TTH=15 (pictured).



NOTE: As we are using a compound component, when the tongue's width (#TTW) is changed, also the slit's width (#TTHL1) changes. This takes place because the link between the two was set when the component was created.

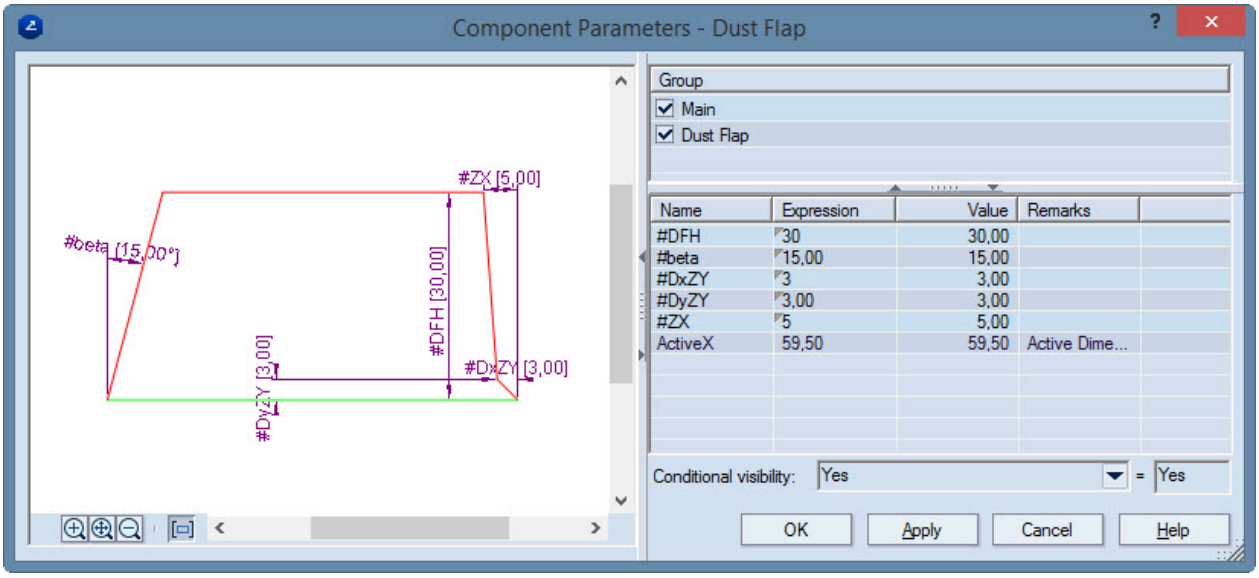
20. Click **OK**.



21. Browse the sequence: Individual Components | 02 Flaps | 02 Flaps | 30 Flap.

22. Drag the component into the graphical area, and attach it onto the last panel of the base.

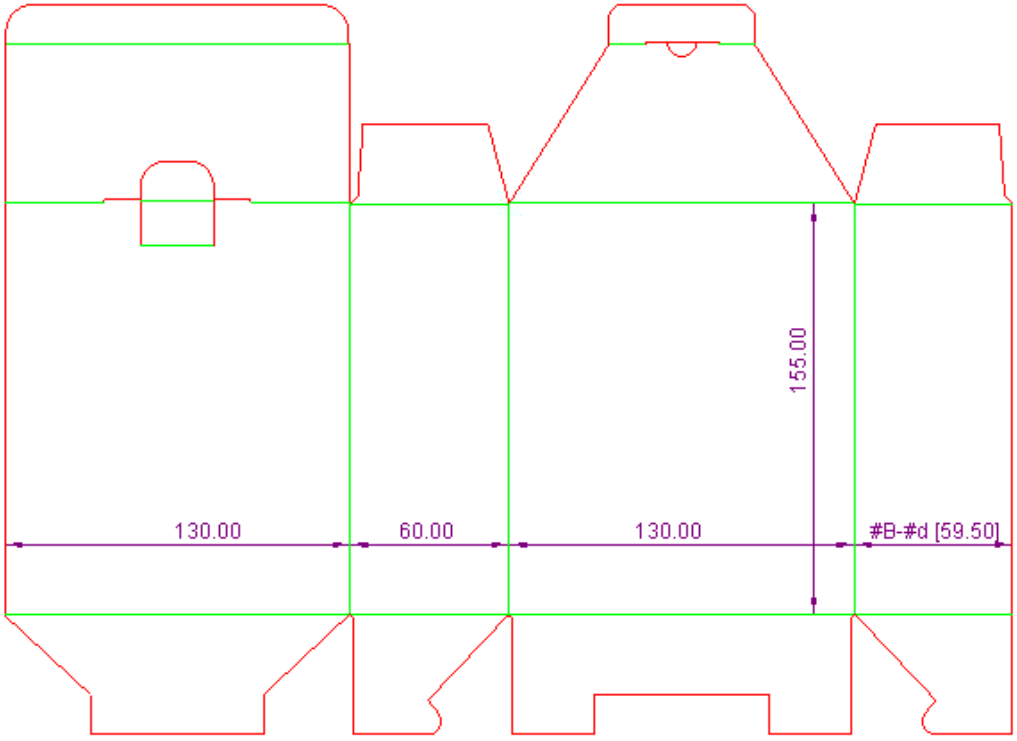
23. After the attachment, in the component's parameter table make #DFH=30.



24. Use the Vertical Mirror functionality to flip the component.

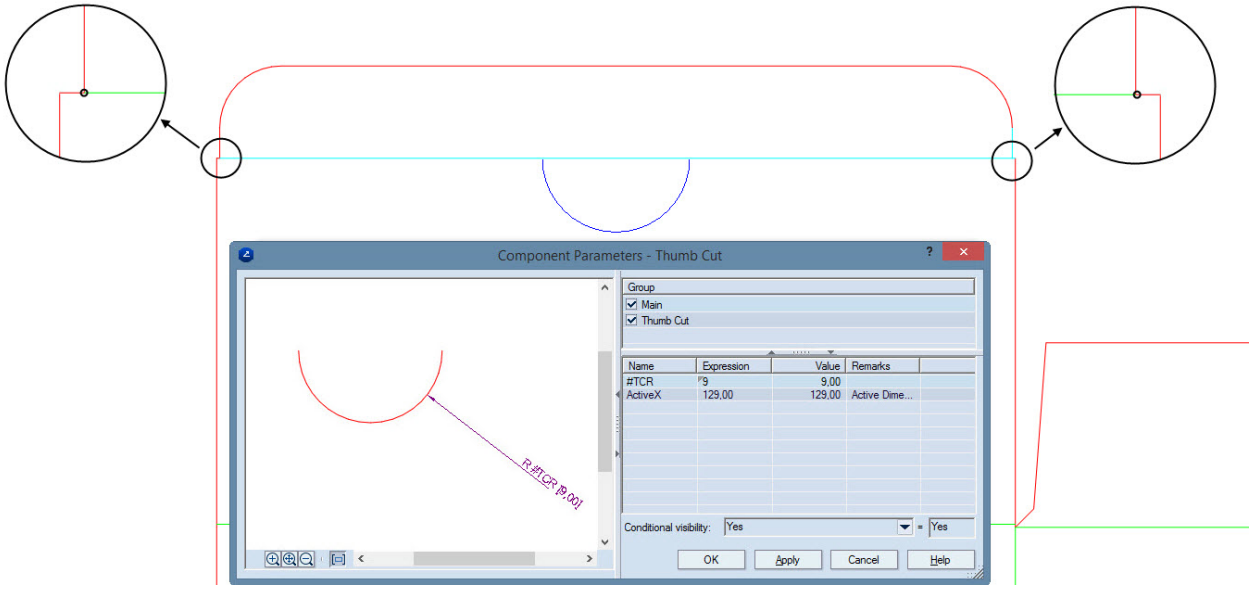
25. Re-attach the component to the opposite side.

26. Press ESC.

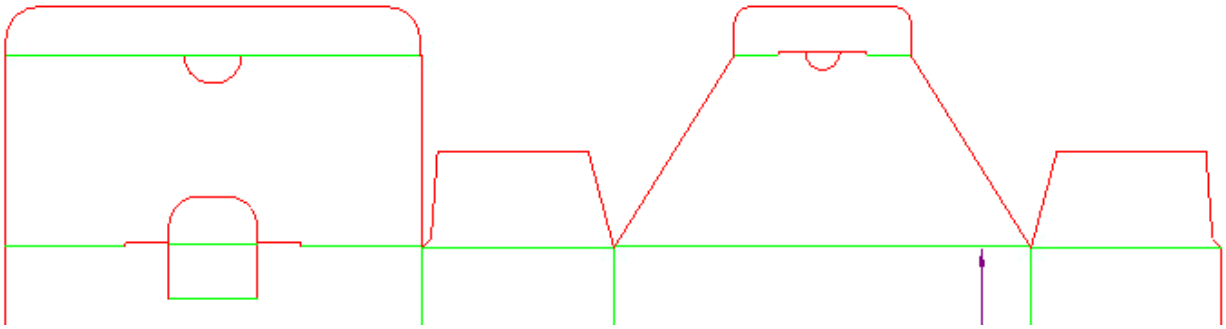


27. Browse the sequence: Individual Components | 10 Cuts | 02 Thumbs and Arcs | 01 Thumb Cut (Centered).

28. Drag the component into the graphical area, and attach it. NOTE: Pay attention where you attach the component (pictured):



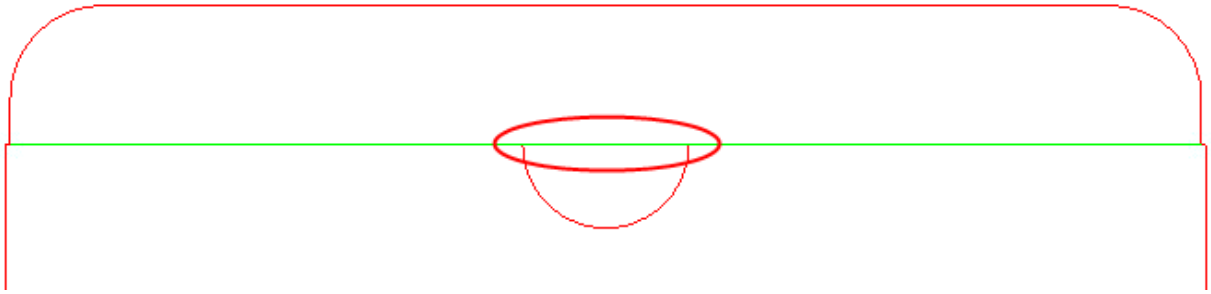
29. In the component's parameters table, make #TCR=9.



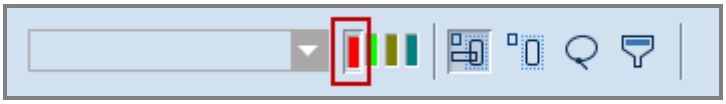
30. Press ESC.

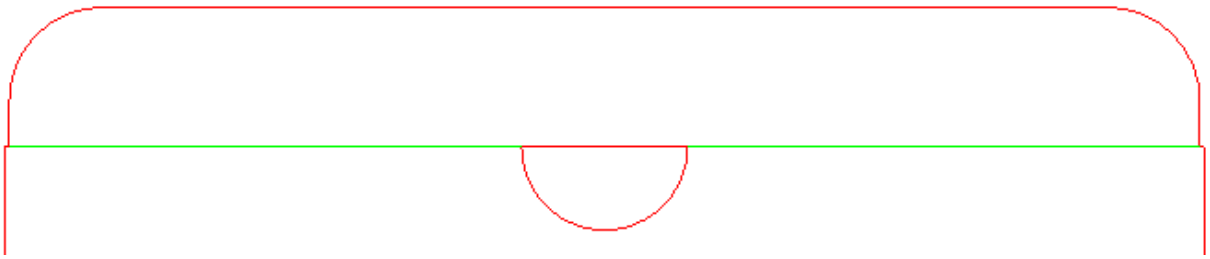
Making a creasing knife cutting

We now need to make a section of the creasing knife cutting (pictured).

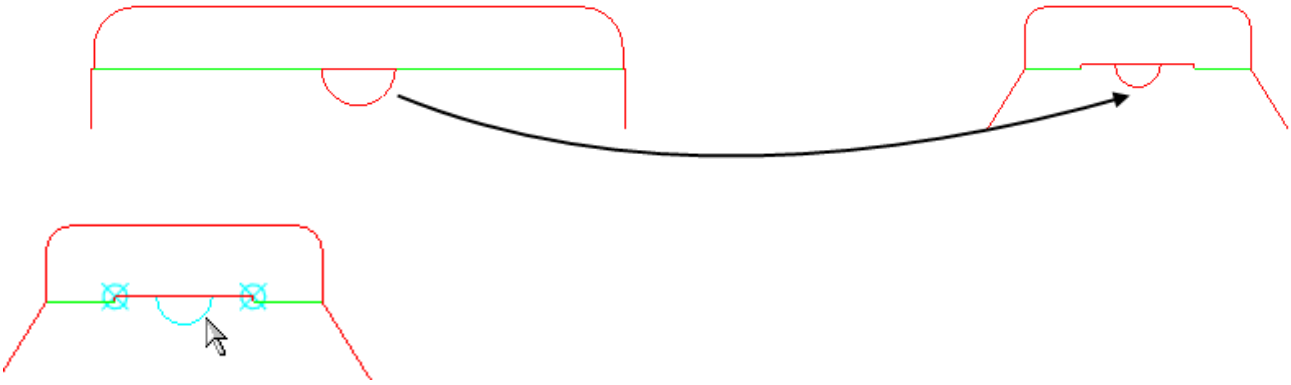


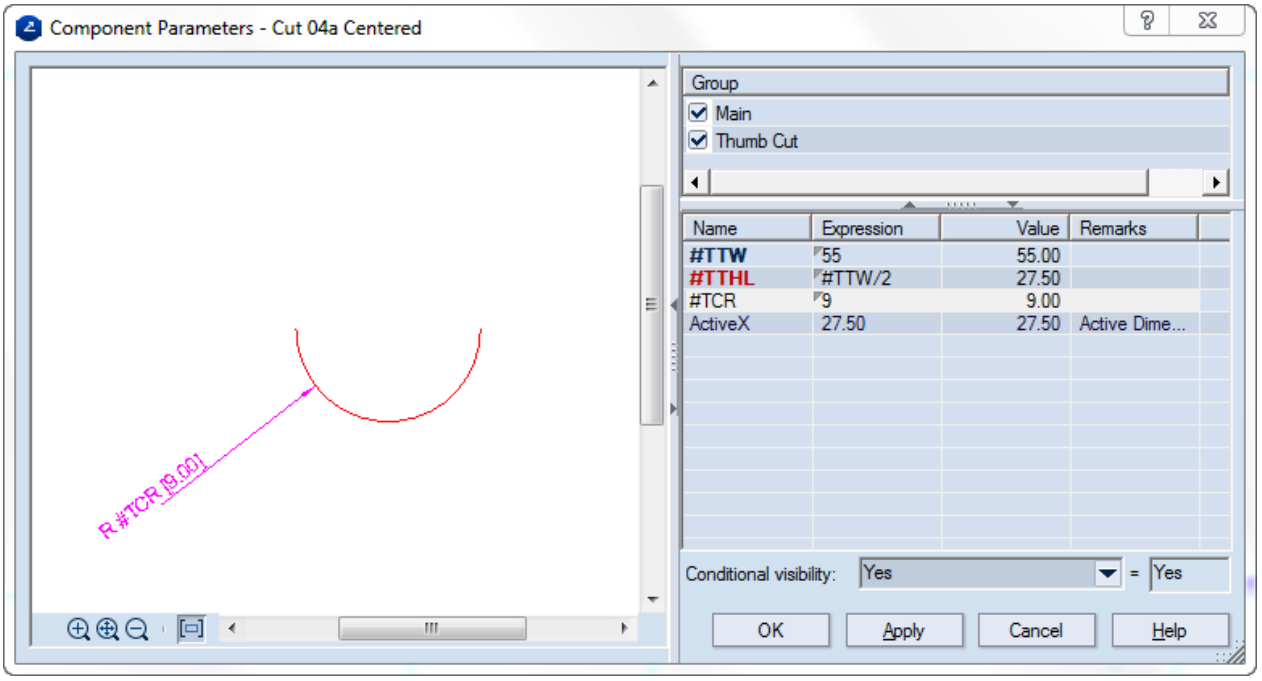
1. On the **Transformations** menu, click **Break**  .
2. Select the Cutting style, and then click the indicated section of the crease line (pictured above).





3. If you want to make the two thumbs identical (see the picture below), double-click the thumb cut, and then, in the table that appears, make #TCR=9.

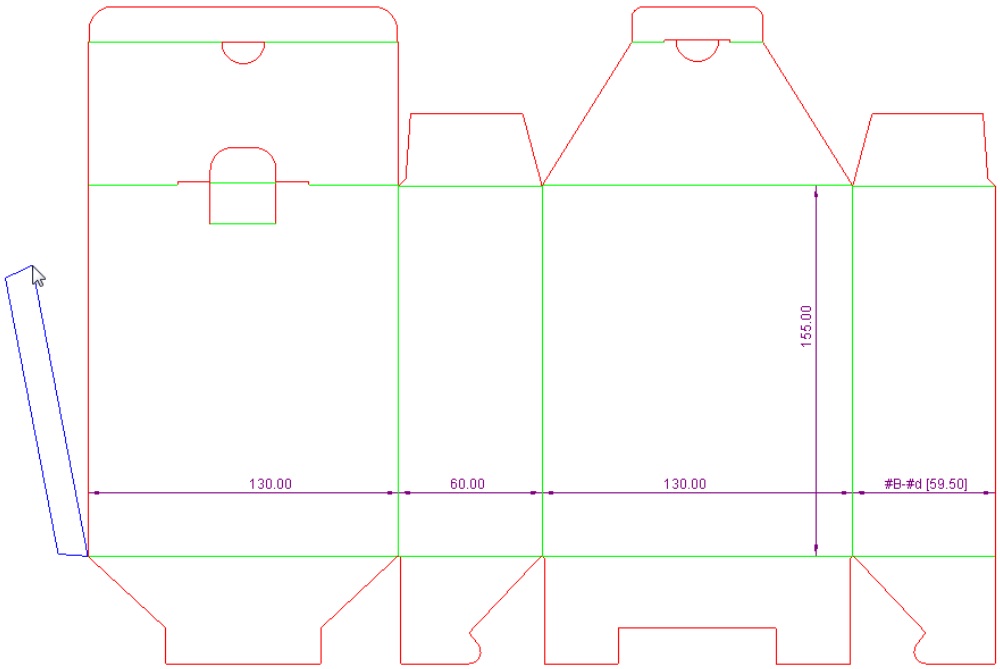




Attaching the glue panel

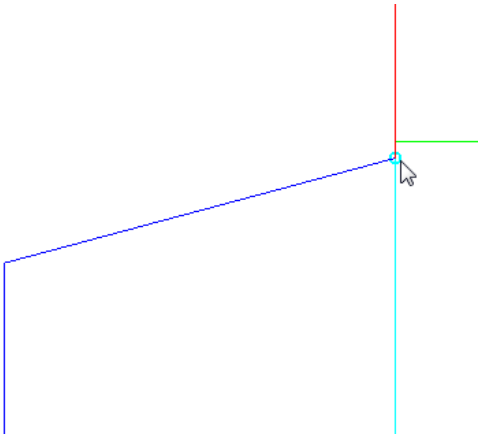
Now we are going to add the glue flap to the left side of the design.

1. Browse the sequence: Synergy Components | Individual Components | 02 Flaps | 01 Glue Flaps | 01 Glue Flap (GLA).
2. Drag the component into the graphical area. Then attach its first active point to the lower left control point of the base.

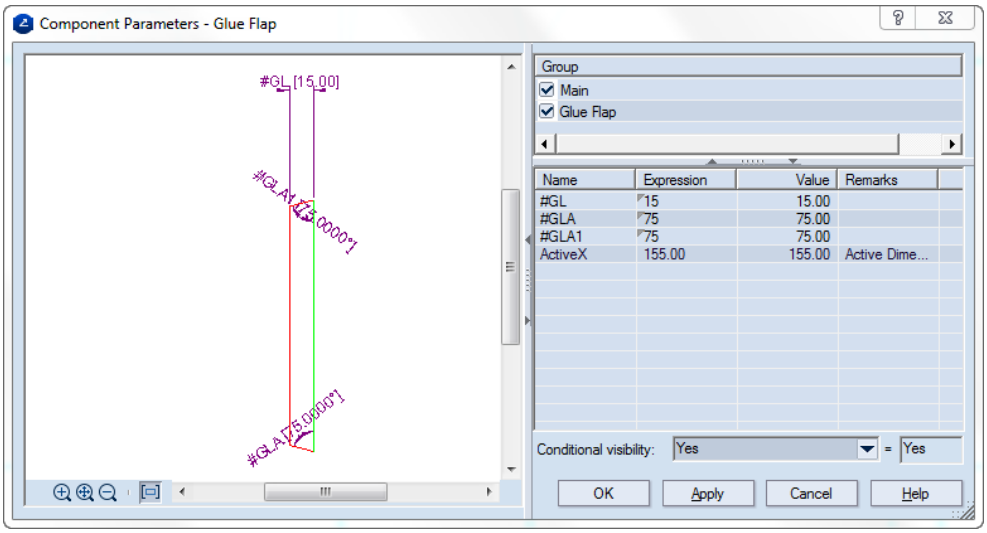


3. Attach the second active point of the glue flap.

NOTE: Pay attention to the point of attachment (pictured).

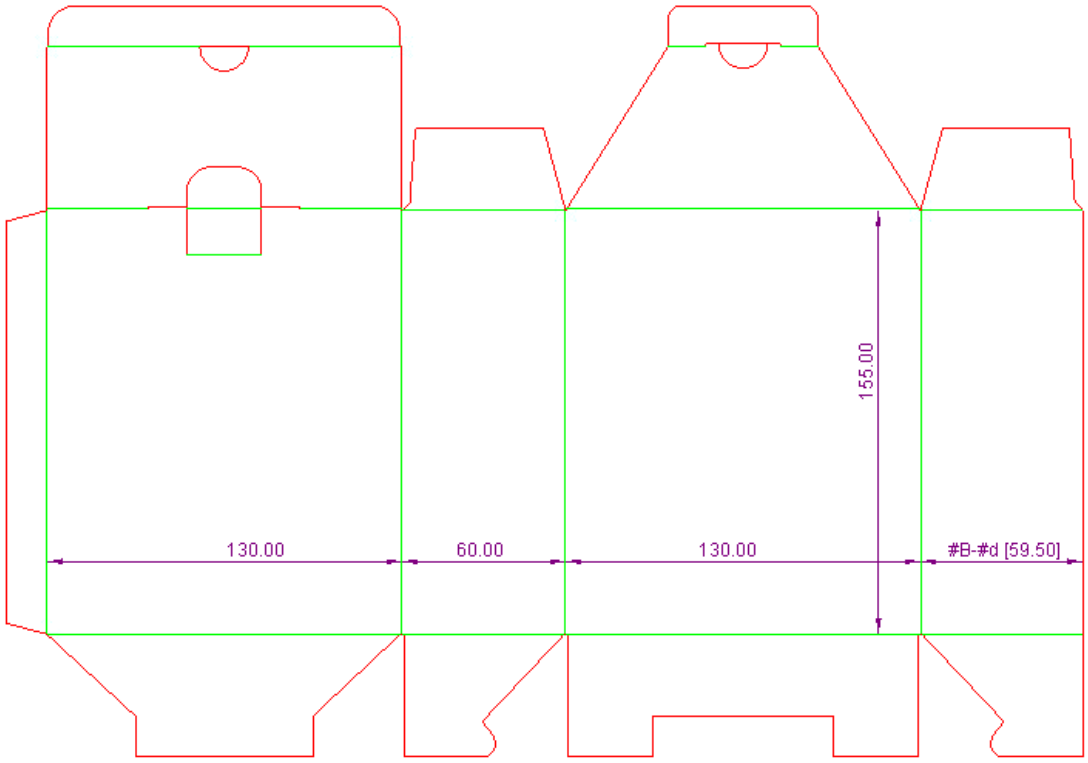


4. In the **Component Parameters** dialog box that opens, make #GL=15; #GLA= 75, and #GLA1= 75.



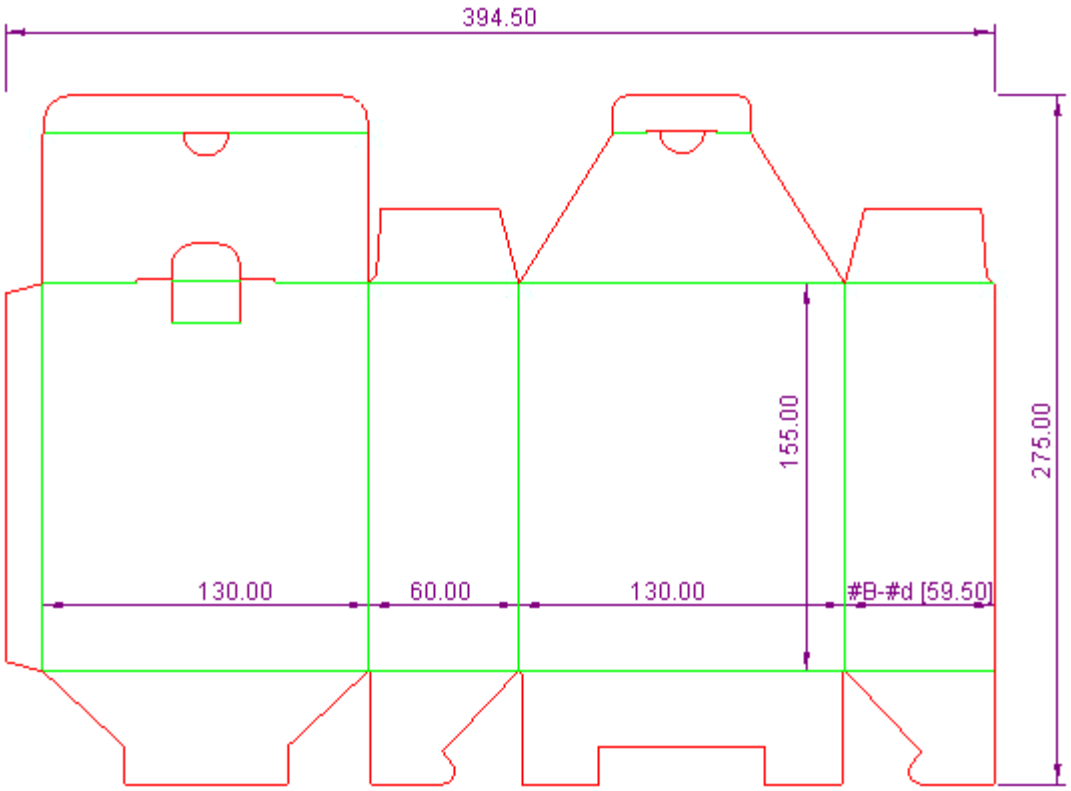
5. To close the dialog box, click **OK.**
6. To exit the mode, press ESC.

The glue flap is now part of the design.



7. To show the drawing's overall dimensions (width and height), click **Overall Dimensions** .

The dimensions are visualized beside the design's vertical and horizontal sides.



8. Save the design in the EVD folder.

Adding/showing dimensions

Each component has dimensions, which were set when it was created. In Package & Display Designer, dimensions can be made visible during the attachment of components – we did this while attaching Tuck End 02 – or afterward — for example, when we positioned the base.

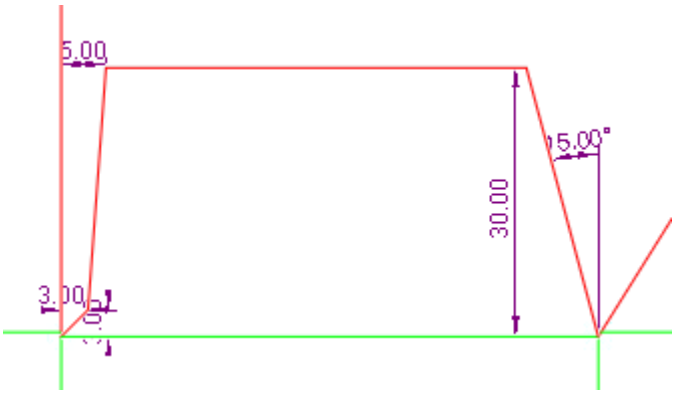
Visualizing the distances in the dust flap

1. Select the left-hand dust flap, and make visible its dimension lines.

There are two techniques of showing the dimensions of a component:

Technique 1: A. Click the component to select it. B. On the contextual edit bar that appears above the graphical area, click **Show component dimensions**  .

Technique 2: Right-click the component, point to **View**, and then click **Dimensions**.



We will hide the dimension 30.

1. Right-click the dimension line, and then click **Hide** on the context menu.
2. Select the right-hand dust flap, and make visible its dimension lines.
3. Hide the dimensions for 3, 3, 5 and 15 degrees.

Repositioning the dimension lines

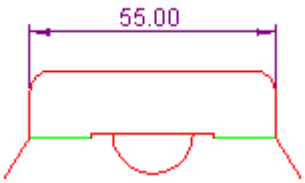
You can reposition a dimension line that gets in the way of other dimension lines or occludes the overall view.

1. Select the dimension.
2. Using the mouse, begin dragging to where you want the dimension line to be.

Adding associative dimension lines

You can add your own dimension lines by using the associative dimensioning functionality.

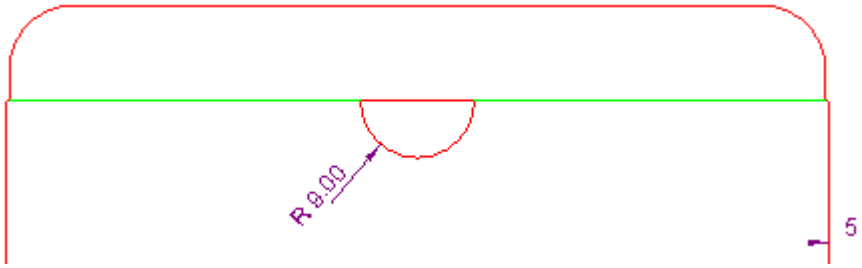
1. On the **Dimension** toolbar, click **Associative Dimension**  .
2. Consecutively click the two objects for which you want to dimension the distance.

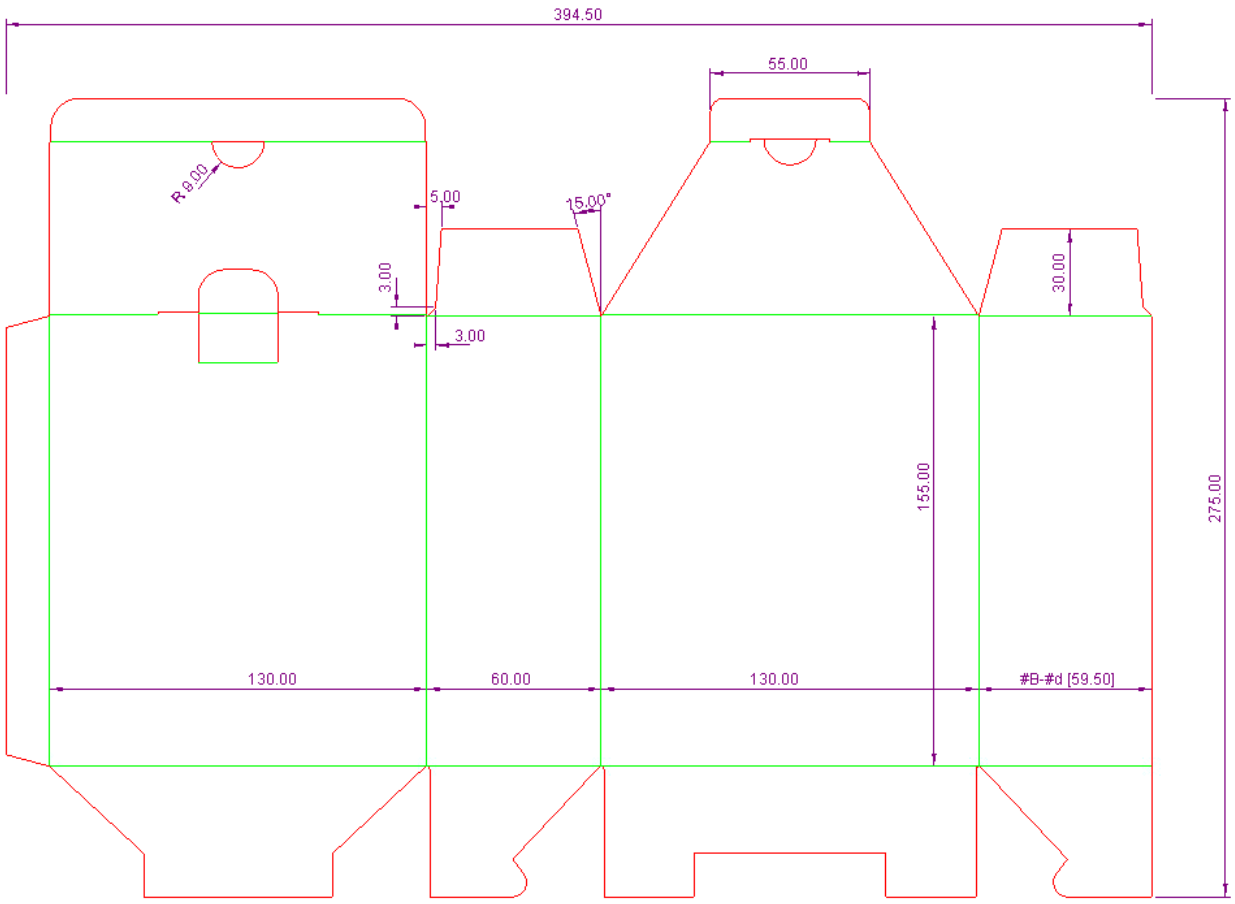


Adding single-object dimension lines

You can dimension a single object by simply pointing to it.

1. On the **Dimension** toolbar, click **Single Object Dimension** .
2. Click the thumb cut (pictured).



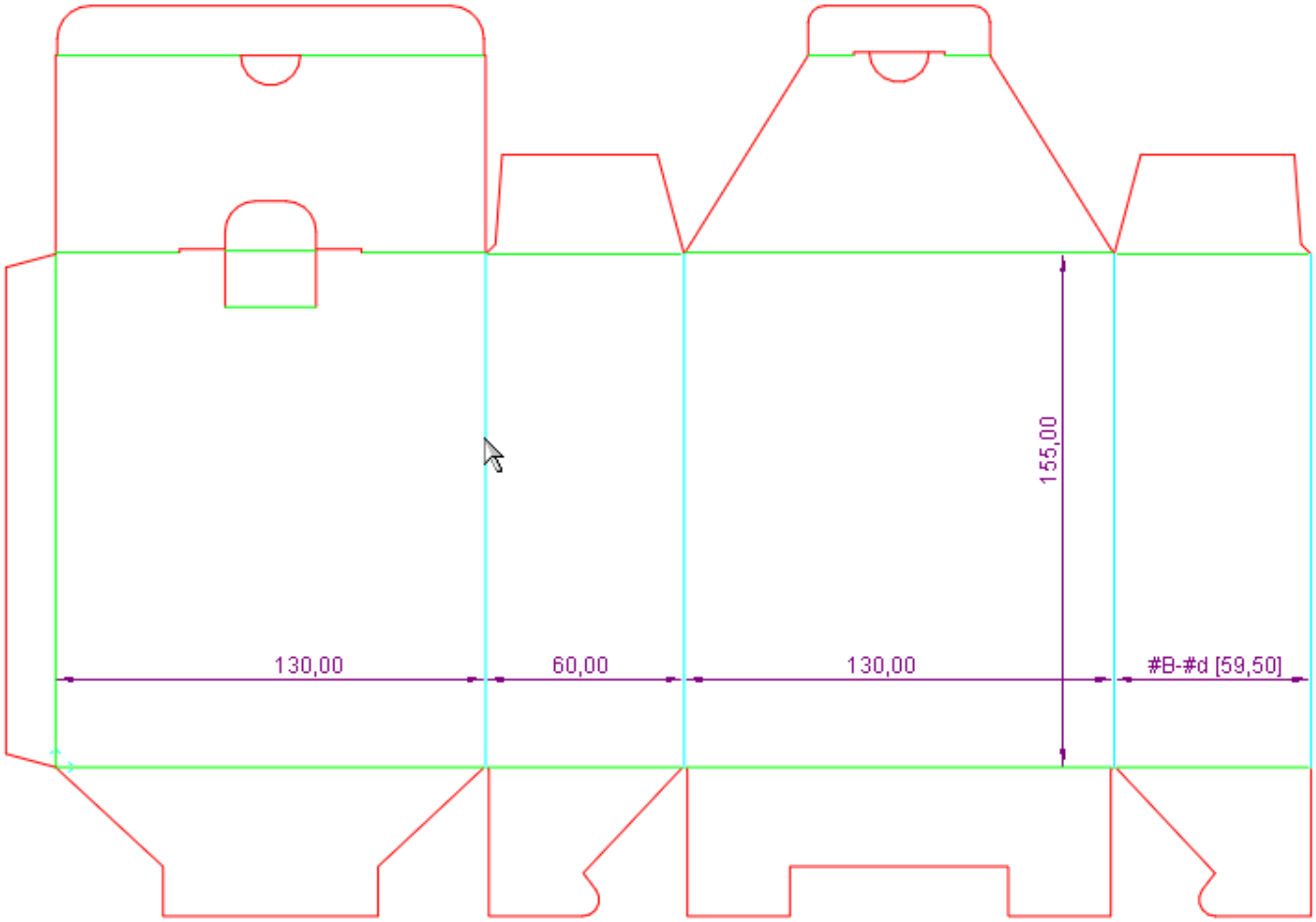


3. Save the EVD file in a folder of your choice.

Changing the box's main sizes

We proceed by changing the width of the box. This property is controlled by the distance #B.

1. Select some of the internal lines of the base (pictured).

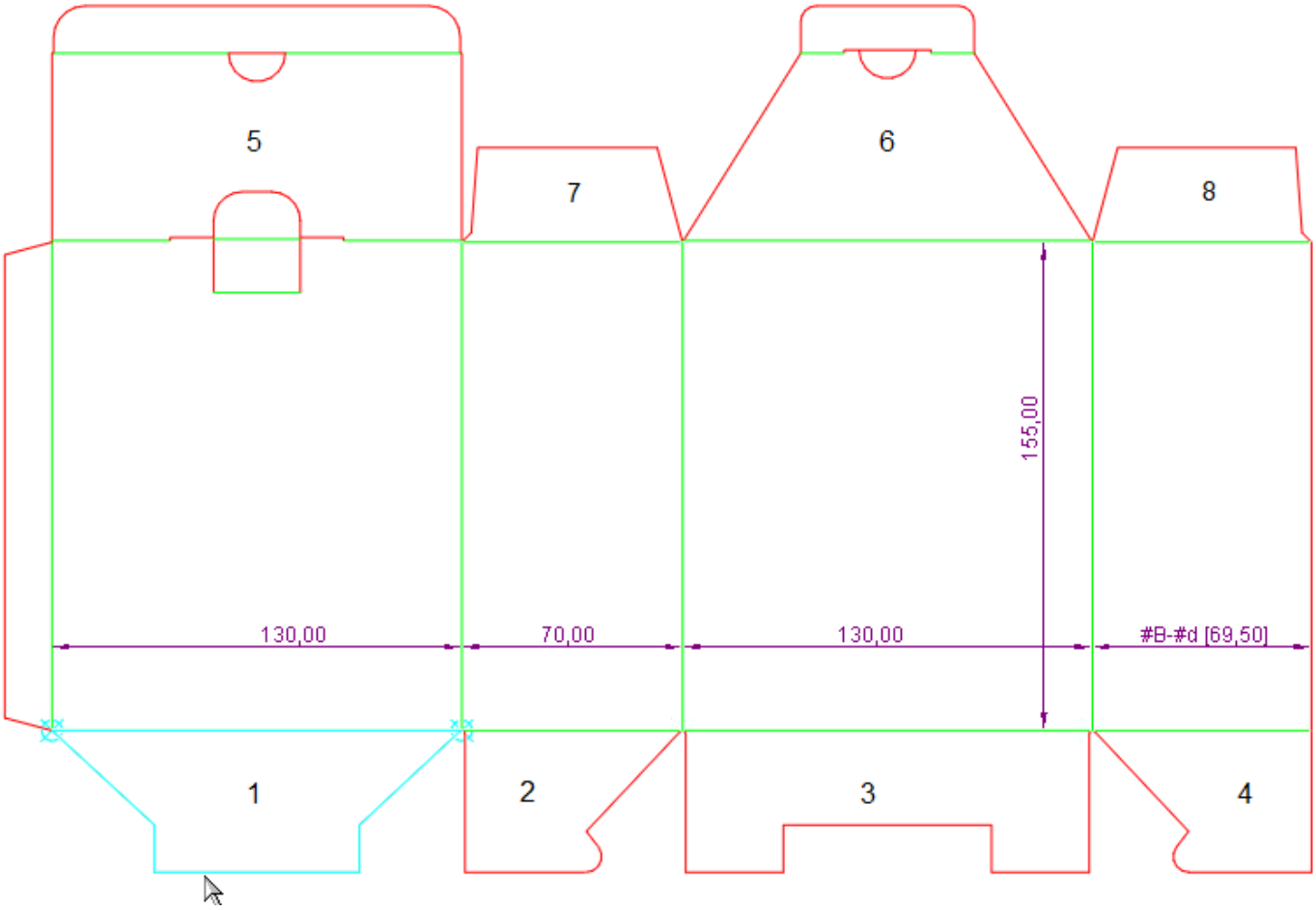


2. In the component parameters dialog box that appears, make #B=70.

   This requires manual editing of some of the box's components. These are all the components of the box's bottom — 1, 2, 3 and 4. For them we need to update the #AX2 value.

   We have to edit panels 5 and 6 also.

3. Select the component 1 (pictured).



4. In the dialog box that appears, in the **Expression** column make #AX2=70.
5. Sequentially repeat Step 4 also for the components 2, 3 and 4.

After the #AX2 distances have been changed, also the top has panels that need to be resized.

6. Select panel 5, and then in the **Expression** column make #PH=70.
7. Select panel 6, and then in the **Expression** column make #TPH=70.

NOTE: If later we choose to change the box's length, we again need to select the base and make #A=100. Then we again need to edit the components 1, 2, 3 and 4 by making their #AX3=100.

We now need to change also the height of the flaps. This is necessary as they must not interfere with the locking system.

8. Select consecutively the components 7 and 8. In their respective tables, make the parameter #DFH=20.

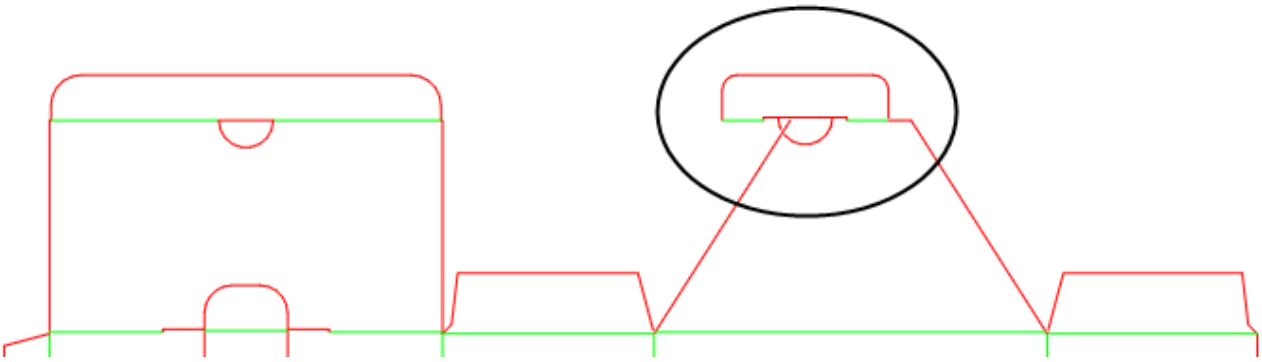
   We proceed by changing the height of the box.

9. Select the base, and then in its table: make #H=200.

   Since the height affects no other components, we do not need to edit any.

Apart from the box's main sizes, we can edit also other components:

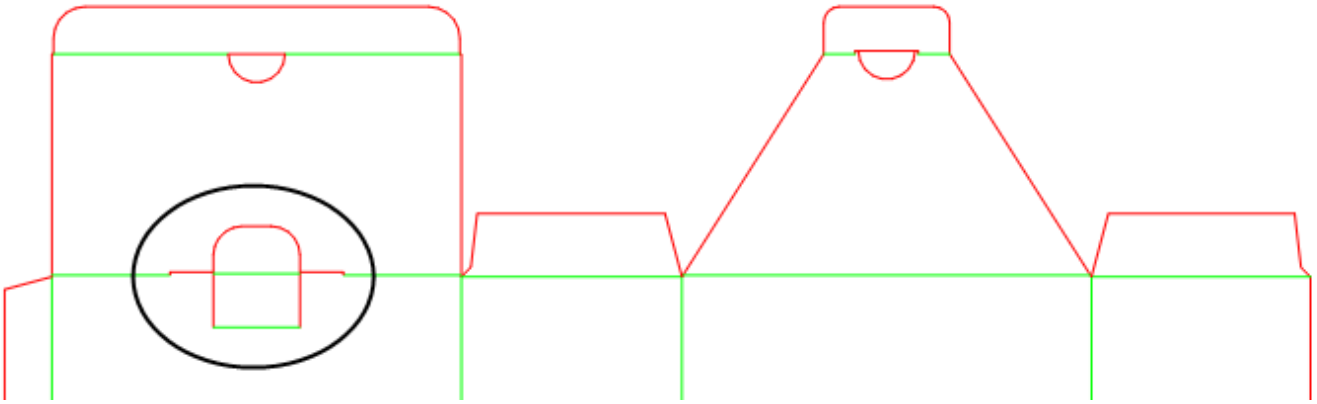
10. To edit the tongue's width, click the component 6, and in its table make #TopW=40.



We can see that the tuck tongue is not where it should be.

11. Select the tuck tongue (pictured above), and in its table make #TTW=40.

12. Select the cut, and then in its table make #TTW=40.



13. Save the file.