Fixing Drafting Errors in Imported Files

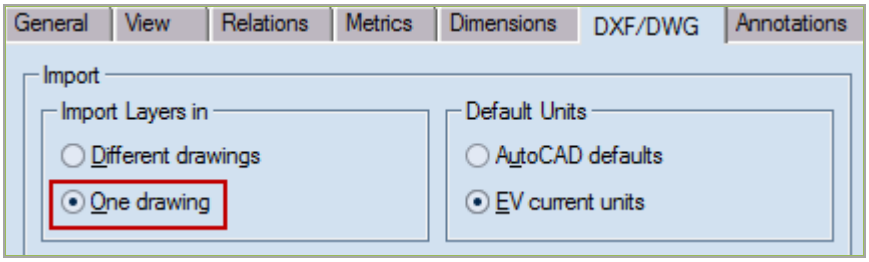
Table of Contents

Task

Imported files often contain incomplete or bad drafting markers that prevent the correct work with a design. To use the imported design as the basis of an actual packaging item, we need to inspect and correct the bad drafting in the 2D structure. This is best done with the Fix Assistant functionality, a tool that detects drafting errors according to preset criteria. Based on the criteria, the tool produces a list of the detected errors, from which we decide which errors are critical and need fixing and which are irrelevant and can stay as they are.

Prerequisites

Before starting work, ensure that external files are imported as one drawing: On the **Tools** menu, click **Options**, and then, in the **DXF/DWG** tab, select the **In one drawing** check box.



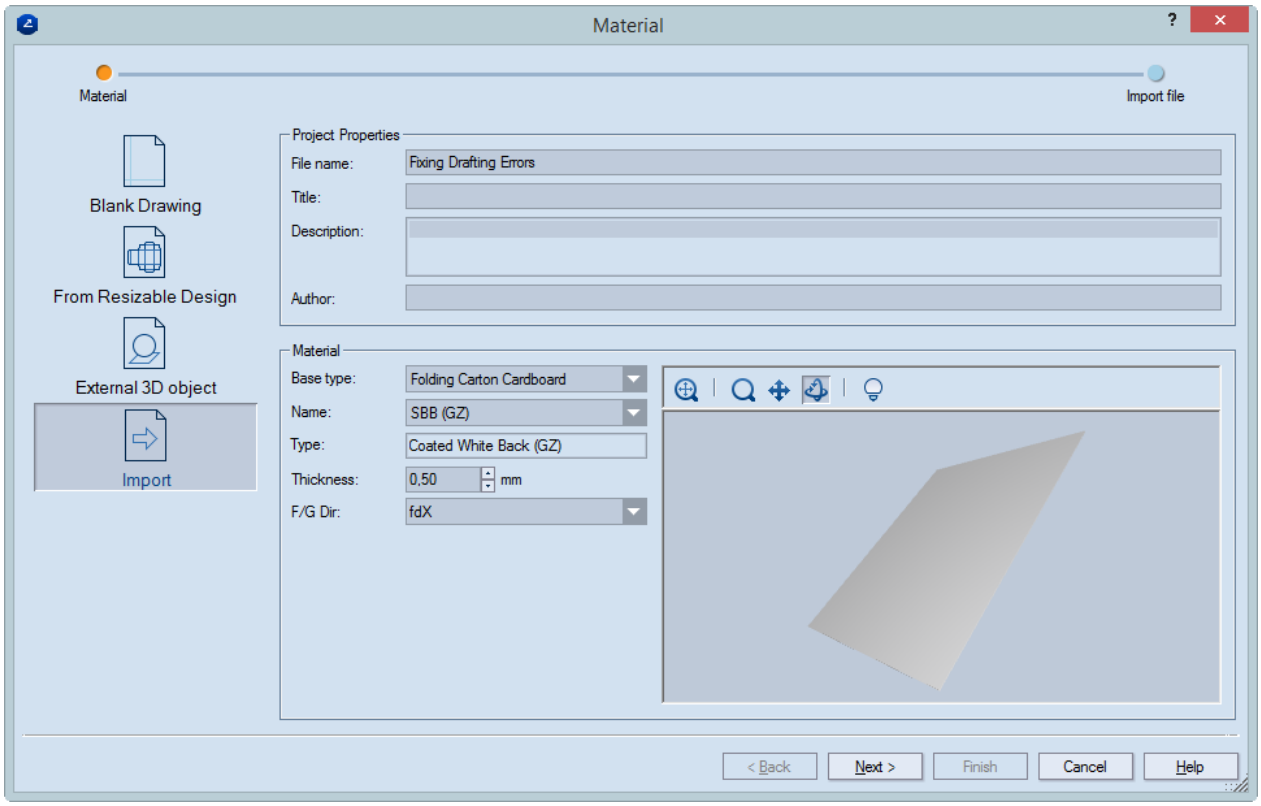
Exercise Description

We begin by importing a file. Then, using Fix Assistant, we will correct the drafting errors. We take the file Fix Assistant Sample.dxf from the folder C:\EngViewWork6\EngView Samples.

NOTE: The structure in this file is for folding carton.

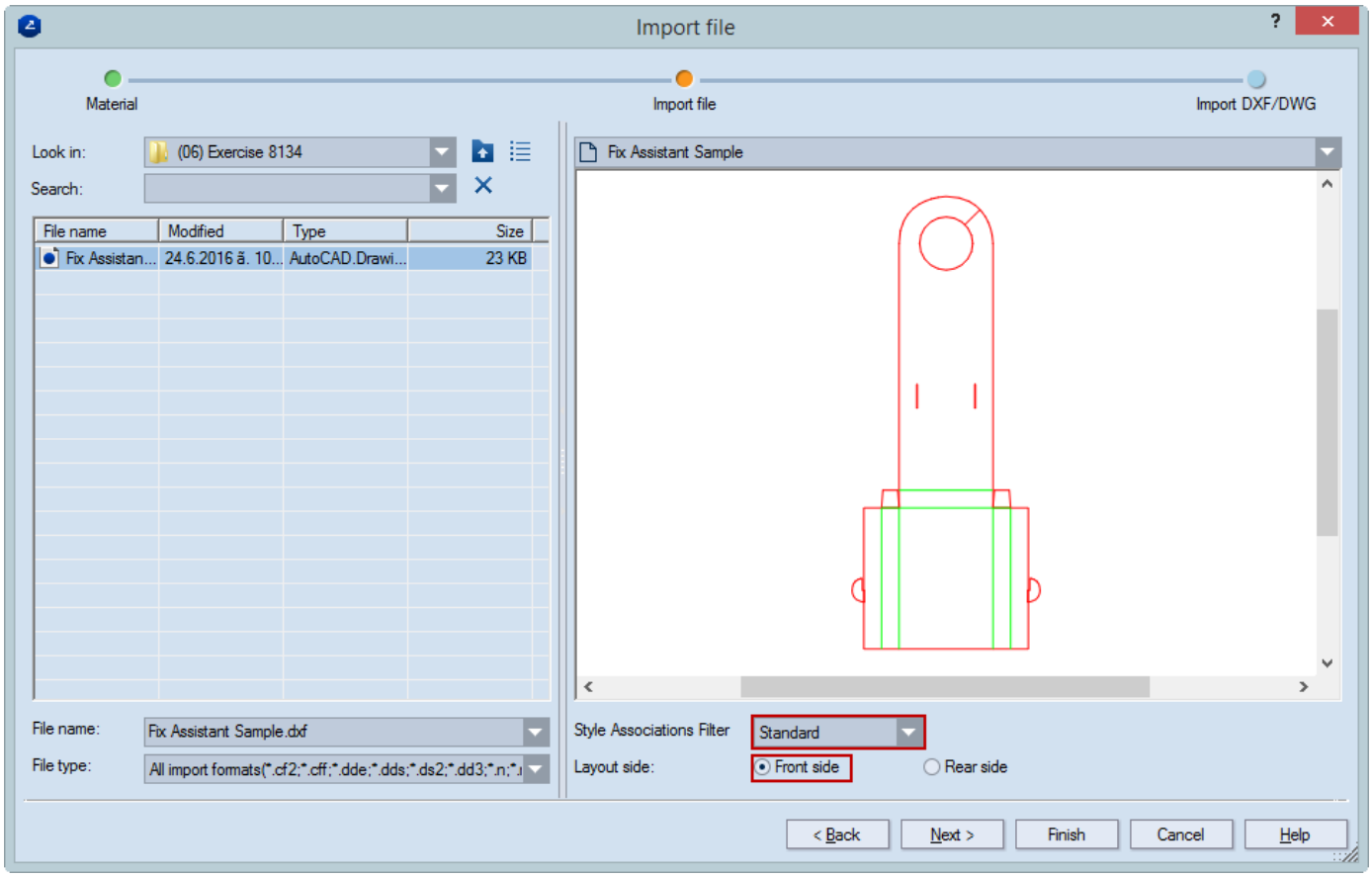
Importing the External File

1. On the **File** menu, click **Import as New Project**.
2. In the Material area, in **Base type**, select Folding Carton Cardboard, and then click **Next**.



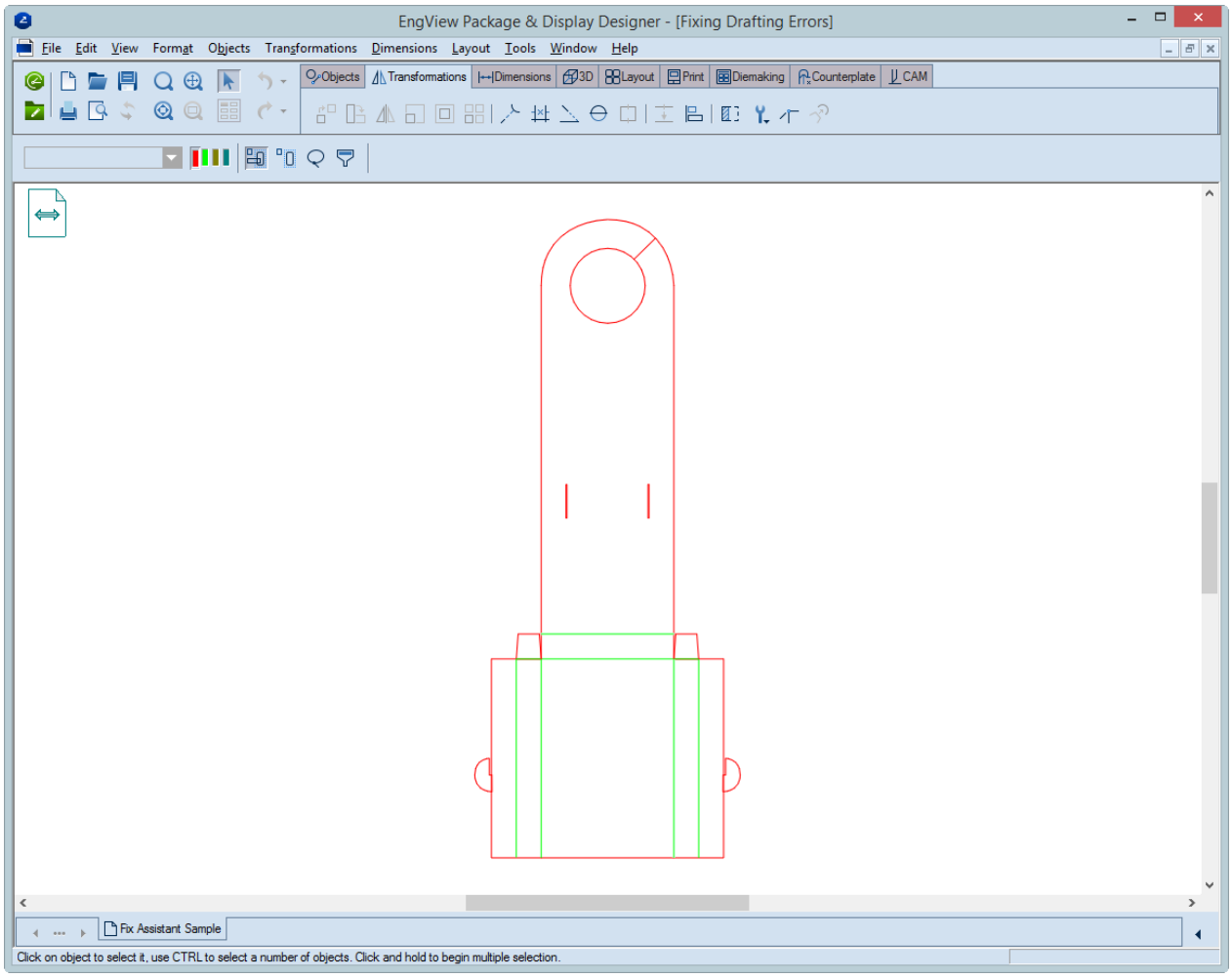
Pic 1: Selecting the correct material (folding carton) in Base type

3. In **Style Association Filter**, select **Standard**; for **Layout side**, select **Front side**.



Pic 2: Selecting a style association filter and layout side

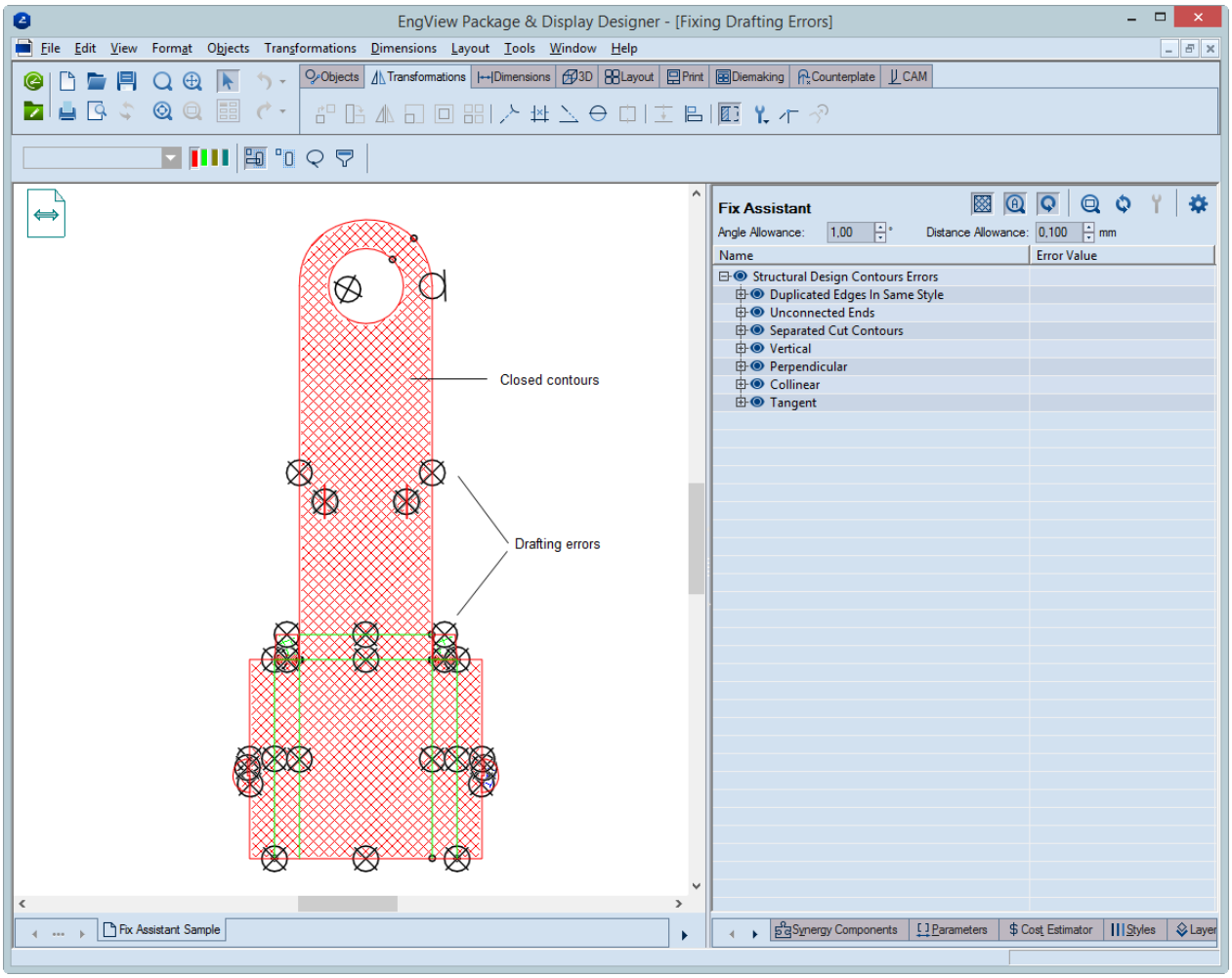
4. Click **Finish**.



Pic 3: The external file has been imported.

Detecting Drafting Errors

1. In the drawing, on the **Transformation** toolbar, click the **Fix Assistant** button  .



Pic 4: Using preset error-detection criteria, Fix Assistant groups the drafting errors.

At first, all detected errors are indicated in the drawing:

- The detected drafting errors are indicated by crossed circles.
- Closed contours are indicated by differently colored hatches.

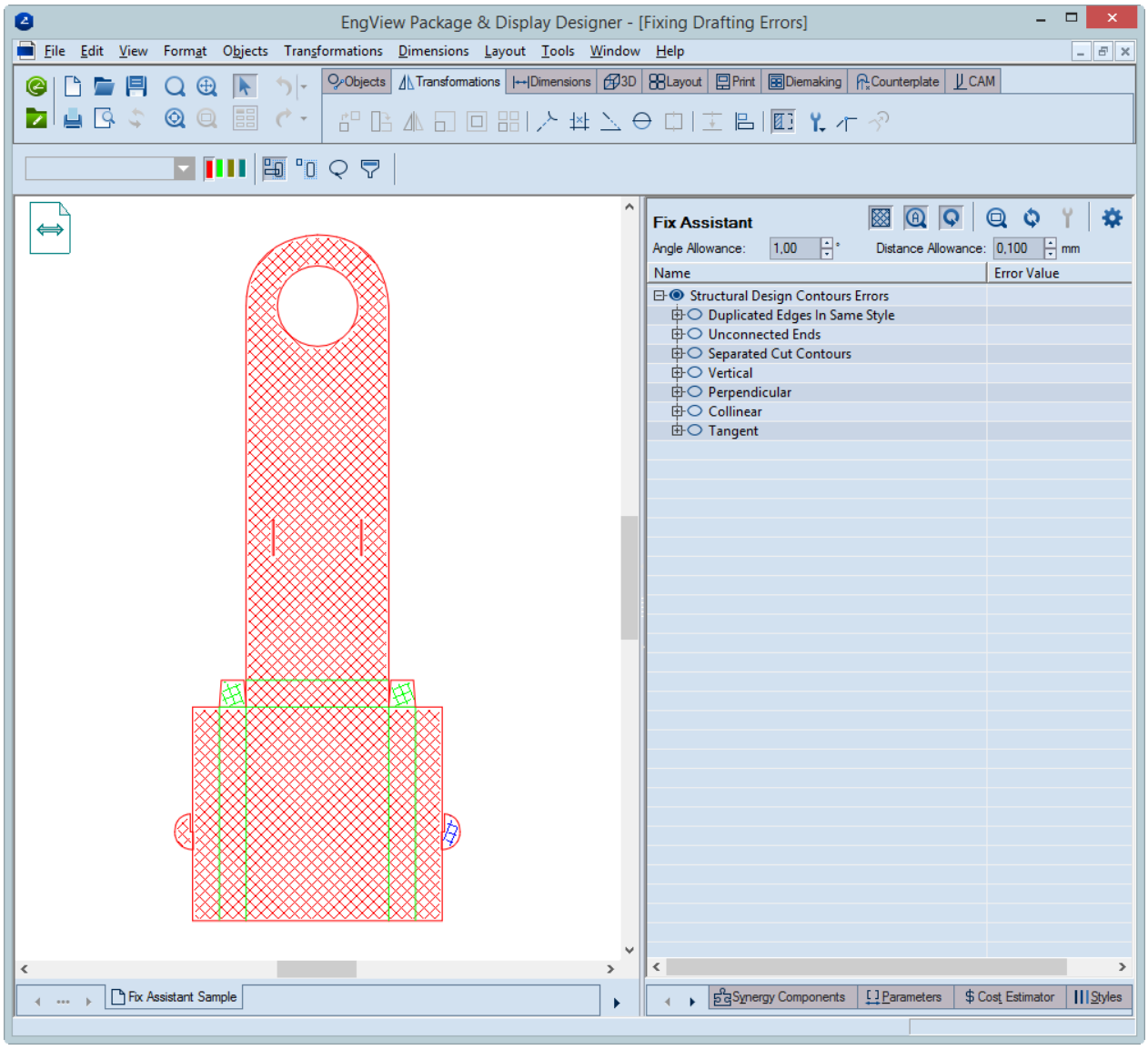
We beging correcting the errors by taking care of closed contours.

Ensuring Contours Are Closed

NOTE: Hatching the closed contours is done by clicking the Hatch Contours button  , (pressed in by default).

In our case, there is a number of panels hatched in the same color. The reason is that there are gaps between the panels, which makes the program treat the panels as a single closed contour. If we want to see the contours more clearly, we can hide the rest of the errors and leave only the **Structural Design Contours Errors** group.

2. To hide errors, in the tabular areas, click the eye icon in front of the respective groups.

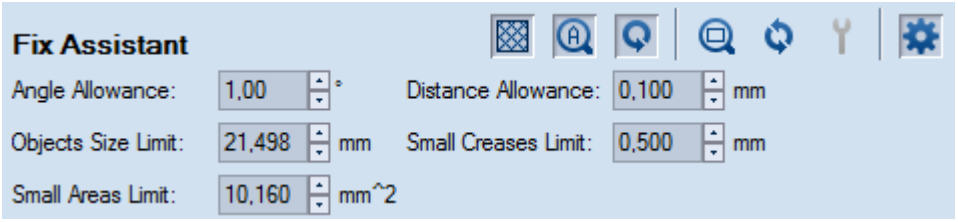


Pic 5: All errors unrelated to contour wholeness have been hidden.

Setting Error Detection Criteria

Now let's make a review of the error-detection criteria. To see all the five criteria,

3. click the **Show Advanced Options** button  .



Angle Allowance Sets the value *below* which angles are detected as constructional errors. The errors that would be detected under this criterion are Horizontal, Vertical, Parallel and Perpendicular.

Example 1: If the angle between two lines is smaller than the value set in **Angle Allowance**, an error for wrong parallelness is reported in the table in the **Parallel** group.

Example 2: If an object forms an angle with the x-axis that is smaller than the value set in **Angle Allowance**, an error for wrong horizontalness is reported in the table under the **Horizontal** group.

Distance Allowance Sets the value *below* which distances between objects of the same type are detected as constructional errors. The errors that would be detected under this criterion are Collinear, Tangent, Concentric and Near-overlapping circles.

Example 1 (lines): If the distance between two lines is shorter that the value set in **Distance Allowance**, an error for wrong collinearity is listed in the table under the **Collinear** group.

Example 2 (circles and arcs): If the distance between the centers of two circles is shorter than the value set in **Distance Allowance**, an error for wrong concentricity is reported in the table under the **Concentric** group. Also, if the radiuses of the same two circles are at a distance from each other that's shorter than the value set in **Distance Allowance**, a **Near-overlapping** error is reported.

Object Size Limit Objects whose lengths are shorter than the value set in **Object Size Limit** are excluded from the detection of geometric relation errors — for example, parallel, collinear and perpendicular. That is, only objects longer than the set limit are considered for error detection. This functionality is especially useful in imported drawings that contain a great number of very tiny objects. For example, drawings with floral-like shapes contain a great many tiny objects (lines, or arcs, or both). When these objects' lengths are shorter than the set limit, they are excluded from the detection of errors. This ensures that only meaningful size-related errors are listed.

Small Creases Limit The limit *below* which crease lines are detected as errors. This is especially useful when too short creases exist between two panels. Due to its shortness, a crease can easily break under the weight of the two panels.

Small Areas Limit The limit *below* which areas are detected as errors.

4. Since we know that the structure we are working with was drawn for folding carton, we can set the distance allowance to 0.4 mm.

5. To apply the criterion, click the **Refresh** button  .

6. To visualize all reported errors at once clear the eye icon in front of the **Structural Design Contours Errors** — this will hide all errors — and then click it again to visualize.

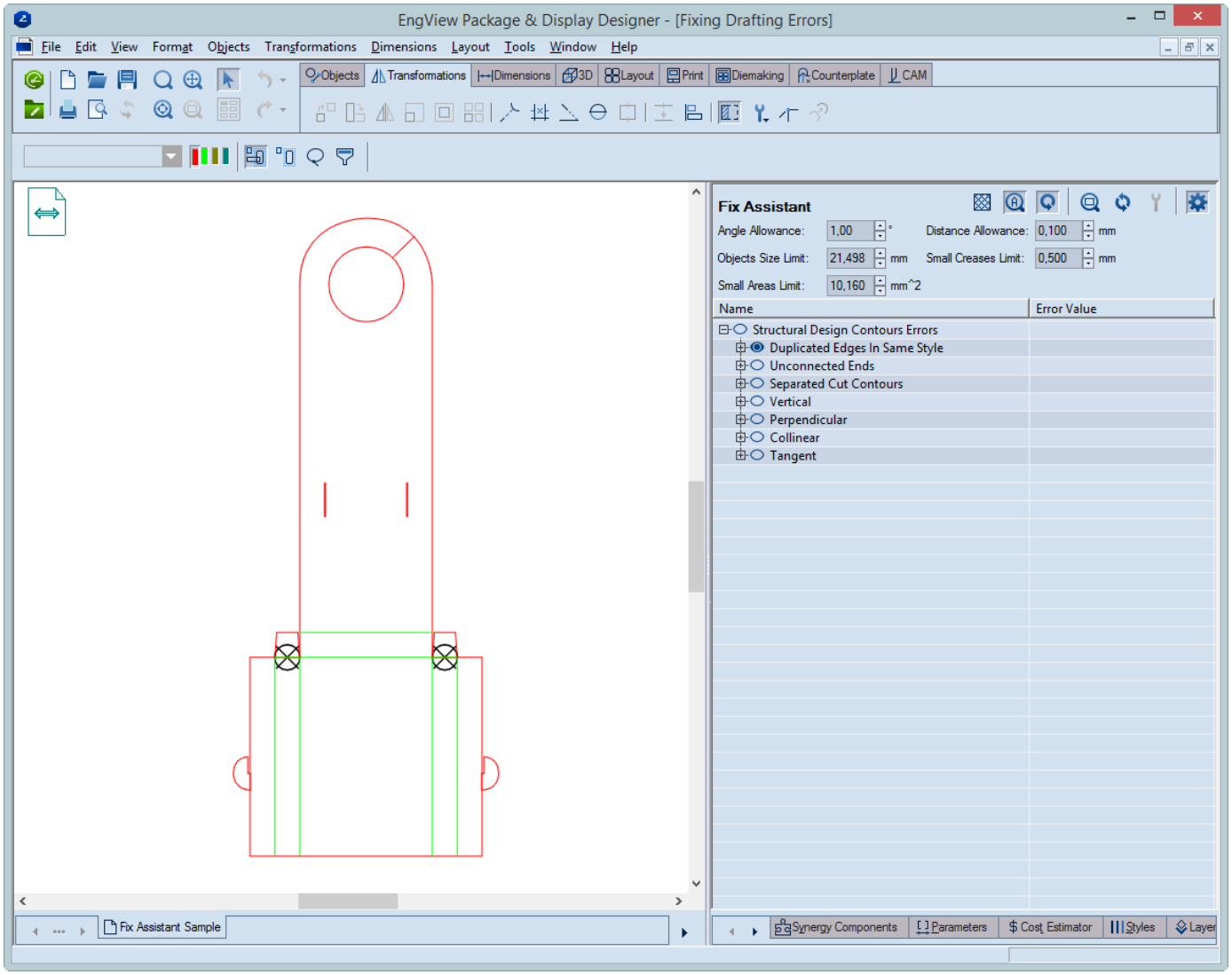
Reviewing the Reported Errors

Duplicated edges in same style

To focus on **Duplicated Edges** errors only, hide the others:

1. Clear the eye icon in front of the **Structural Design Contours Errors**
2. Click the the eye icon in front of the **Duplicated Edges In Same Style** group.

The errors are indicated in the graphical area:



Pic 6: Only the errors related to contour wholeness are highlighted in the graphical area.

We begin by opening the list of errors:

3. Click the Plus sign at the beginning of the row.
4. Click the first error: L3.

The Auto Zoom functionality is turned on by default, and in the graphical area the error is shown in a zoom.

NOTE: If in your case, the button is not pressed in, click it.

5. Click **Fix Selected Issue**  .

One of the duplicate objects is deleted, and the error has disappeared from the list. (This last action has taken place because also the Auto Refresh functionality is turned on.)

We are immediately directed to the next error of this type.

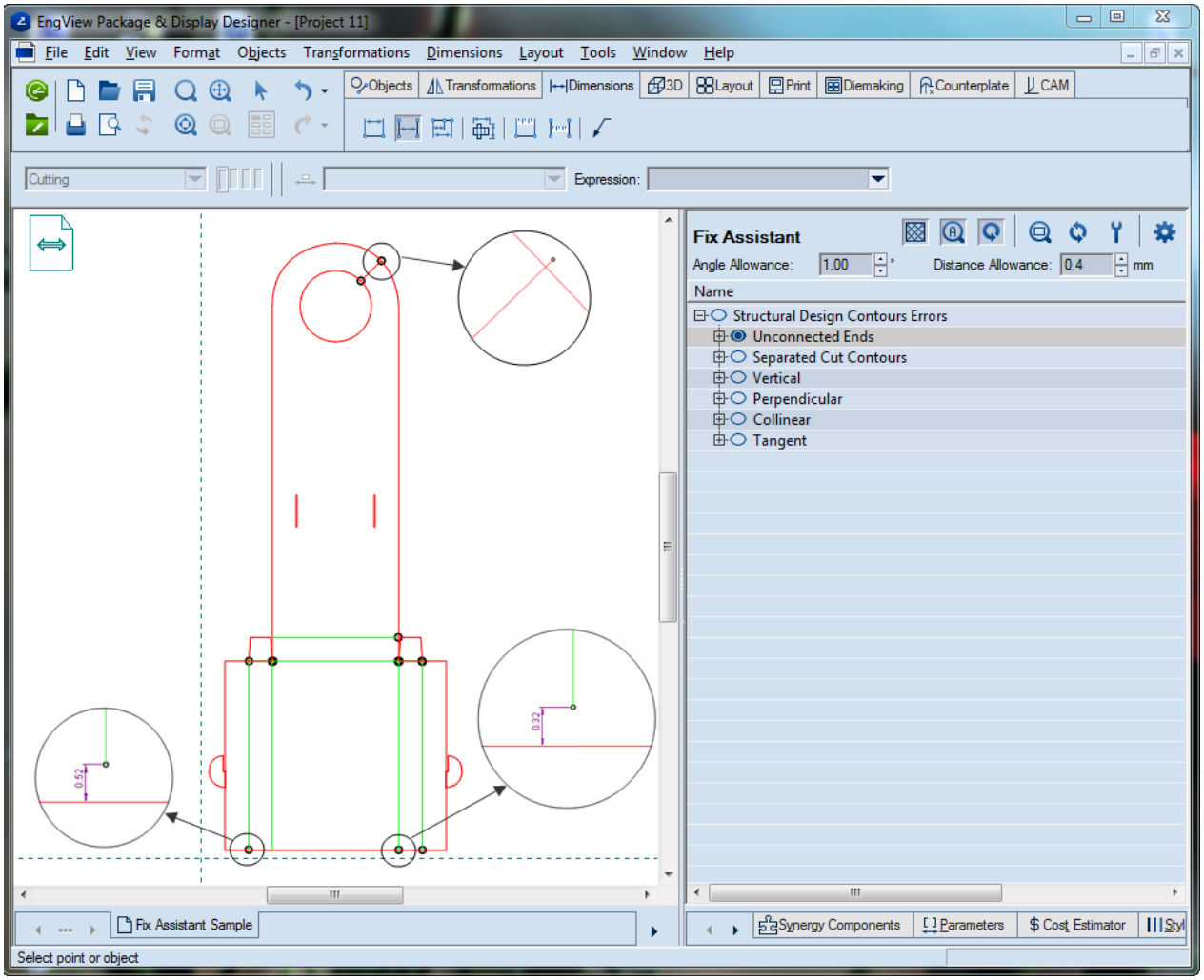
6. Click **Fix Selected Issue**  .

Also this error has disappeared. Because all the erros in the group have been corrected, the group has disappeared.

NOTE: The errors that permit automatic fixing — the **Fix Automatic Issue** button is enabled automatically — can be fixed simultaneously by selecting the group's name and then clicking the **Fix Selected Issue** button.

Inspecting unconnected ends

Make visible the next group of errors – Unconnected Ends. This type of errors do not fall under the Distance Allowance criterion. Here, all unconnected ends are reported regardless of their distance to other objects.

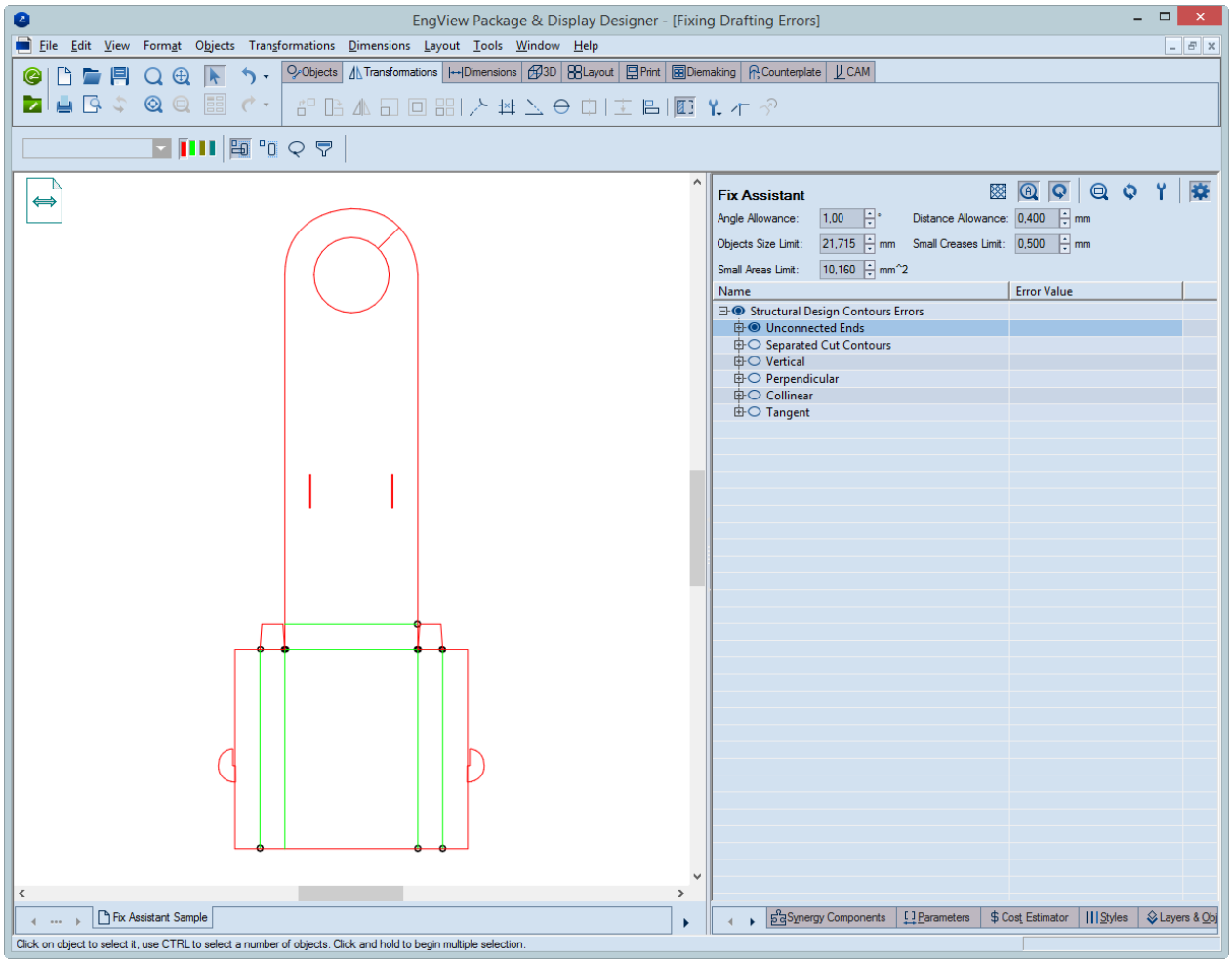


Pic 7: The errors indicating unconnected ends

This type of error allows automatic fixing. But in this automatic fixing the criterion Distance Allowance will be taken into account and only those unconnected ends will be fixed whose lengths are shorter than the set threshold.

NOTE: We can inspect the errors one by one and make decisions as to which ones to fix. In our case we will use the automatic fixing.

1. Click the Unconnected Ends row, and then click the **Fix Selected Issue** button  .

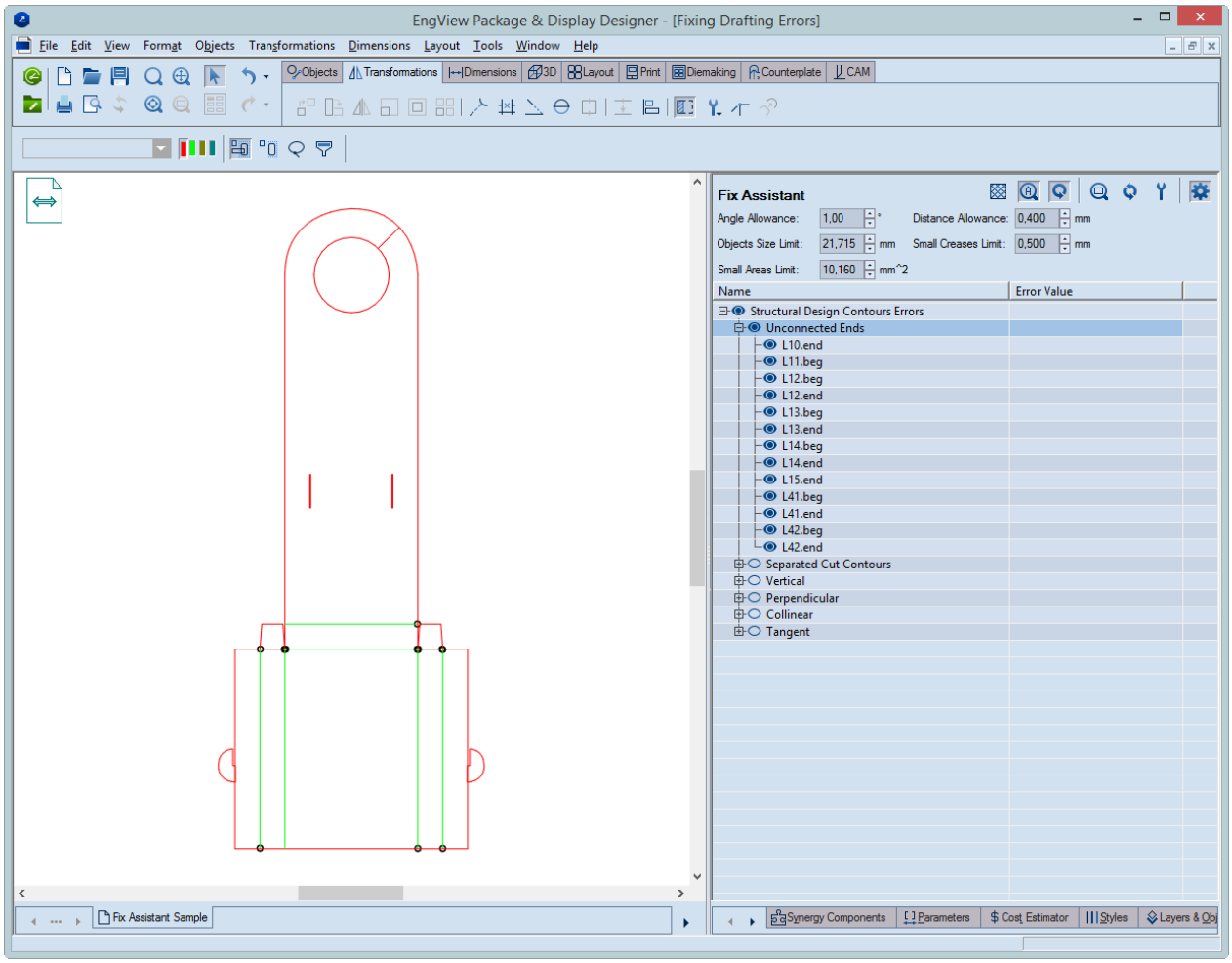


Pic 8: Unconnected ends with lengths less than 0.4 mm have been eliminated from detection.

Now unconnected ends greater than 0.4 mm remain.

Let us inspect them one by one.

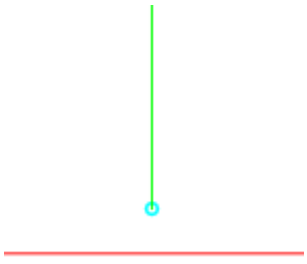
2. In the tabular area, open the group



Pic 9: Unconnected ends as indicated in the graphical and tabular areas.

3. Click the first error (L10.end).

As Autozoom is turned on, the error is immediately zoomed upon in the graphical area. Note that the end of Line 10 is highlighted in light blue.



Pic 10: The light blue-highlighted end needs to be extended to the cut line.

4. To close the gap, on the Transformation toolbar, click **Extend**  .

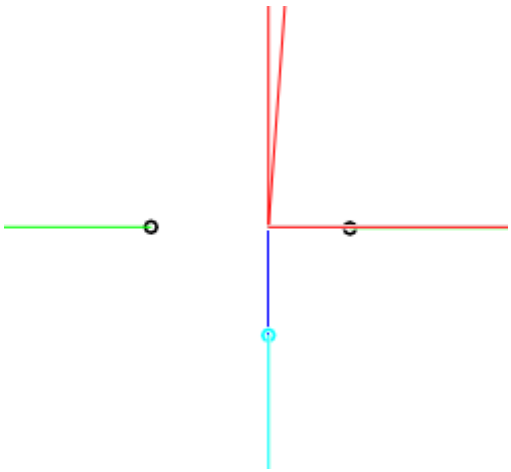
When the gap has been filled, the error disappears from the list (because of the Autorefresh functionality) and the program zooms to the next error in the list, highlighting the beginning of Line 11.

5. Repeat Step 4 also for L11.

The program zooms to the next error in the list, highlighting the beginning of Line 12.

Here let's zoom in a bit more to get a closer look.

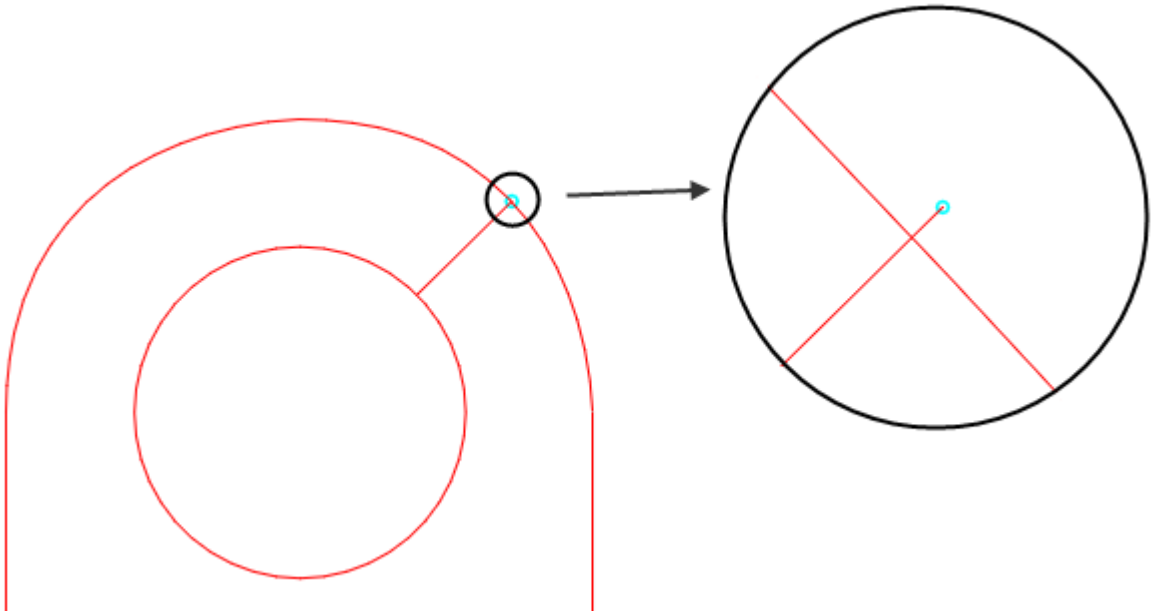
6. Click **Extend**  , and then extend L12.



Pic 11: Extending the line L12

7. Repeat Step 6 also for L12.end, L13, L14, L15 and L40.beg.

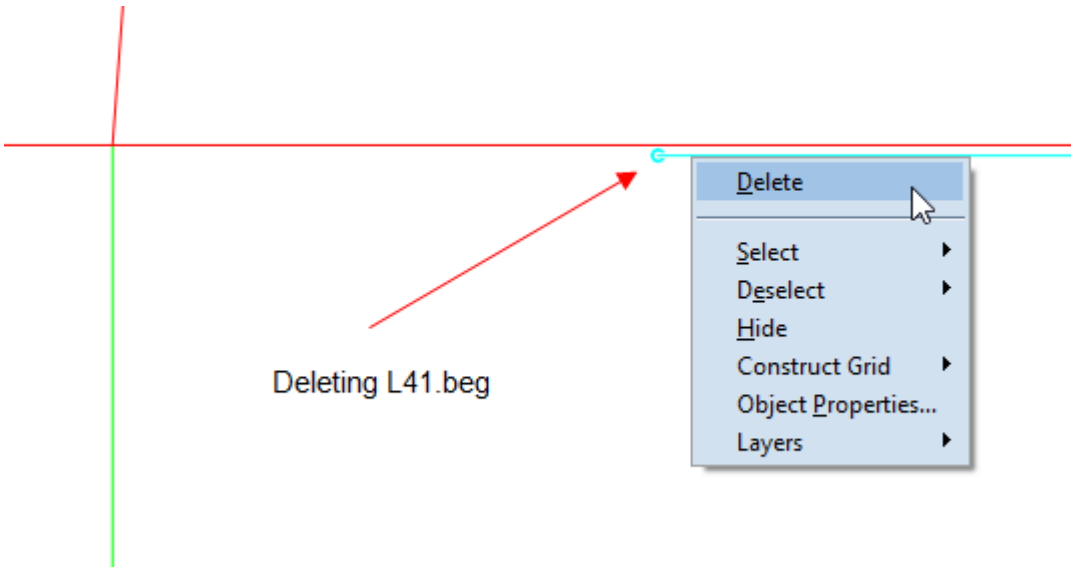
8. Error L40.end should be fixed by using the **Trim**  tool.



Pic 12: Error L40.end

Fix Assistant lets us decide what to do with the detected errors. In the case with error L41.beg, we will not extend the line but will delete it instead.

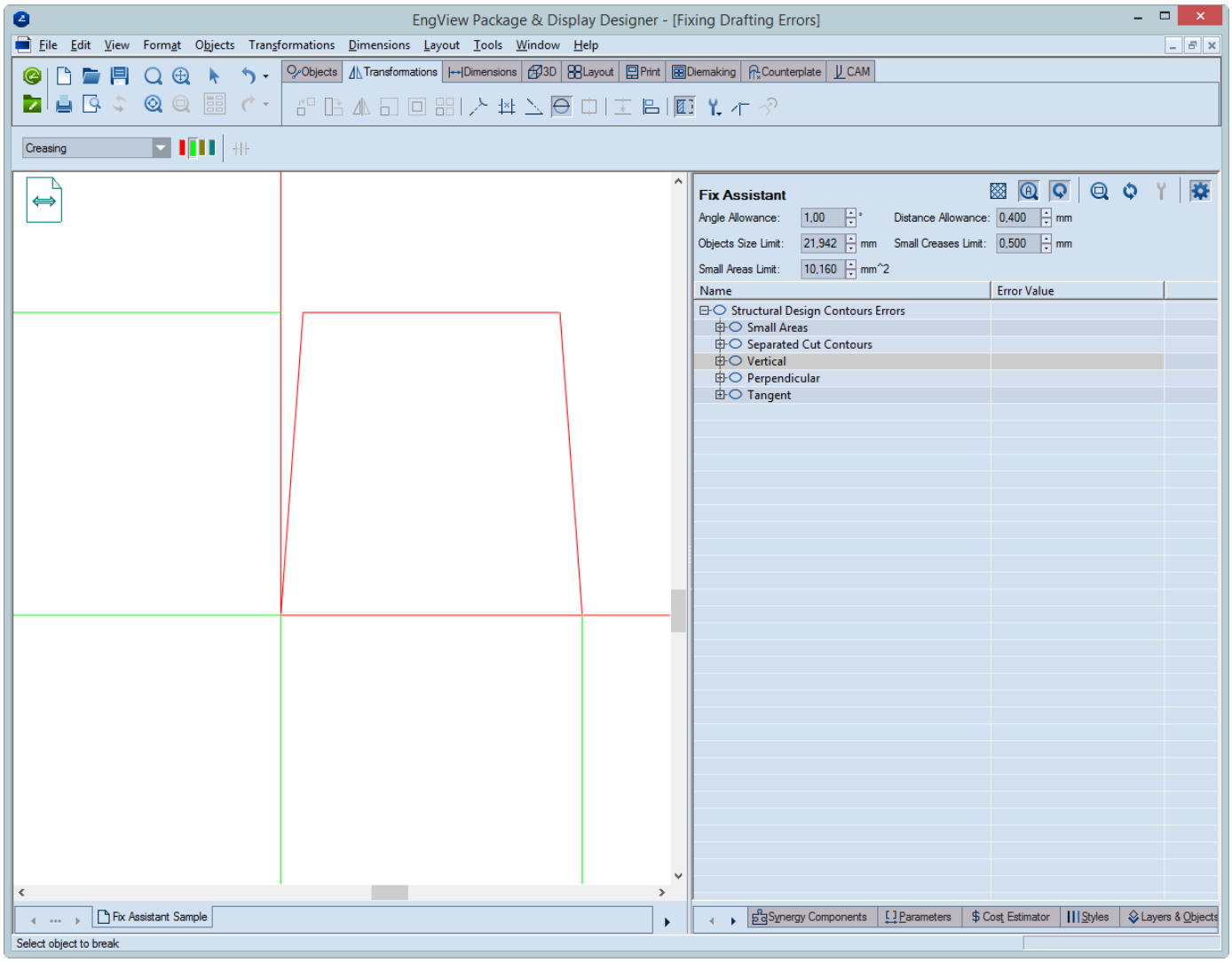
9. Right-click line 41, and then click **Delete** on the conext menu.



Pic 13: The line 41 will be deleted because it is not needed.

10. Repeat Step 9 also for line L42.

Note now that the group **Unconnected Ends** has disappeared.

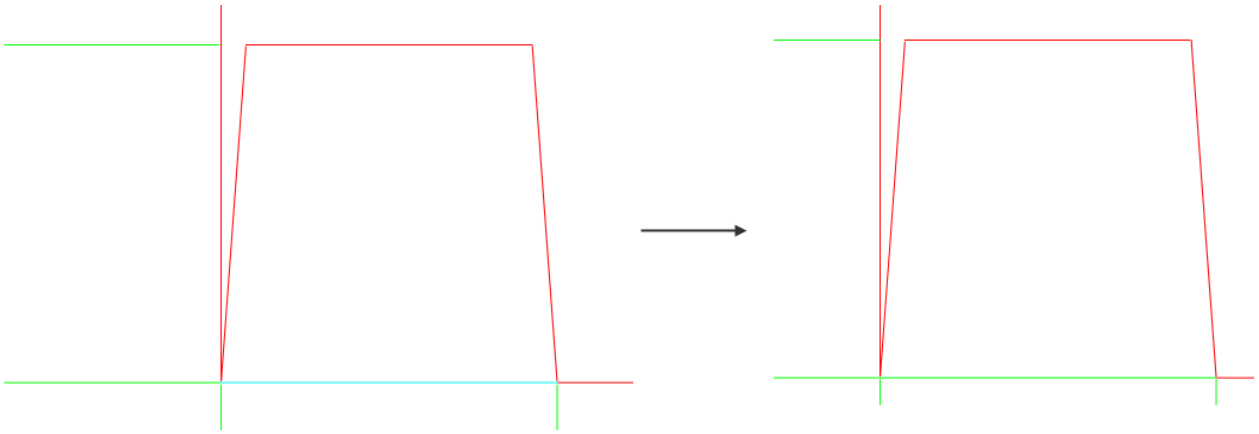


Pic 14: After the unconnected ends have been removed, the entire group disappears.

Let us use the fact that we are where there is one further error: a line in the Cutting style that needs to be in the Creasing style. This error has been detected and listed in the **Separated Cut Contours** group but we can fix it while we are in the same area. Note that the error will disappear from the **Separated Cut Contours** group.

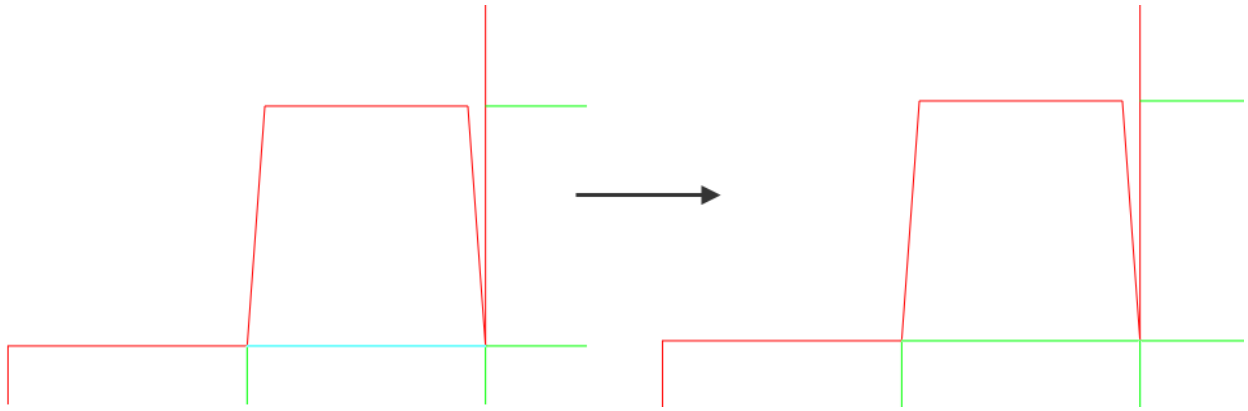
11. On the **Transformation** toolbar, click **Break** .

12. Select the Creasing style, and then click the part with the flap.



Pic 15: Breaking the line with a Creasing style.

13. Repeat step 12 for the other flap.

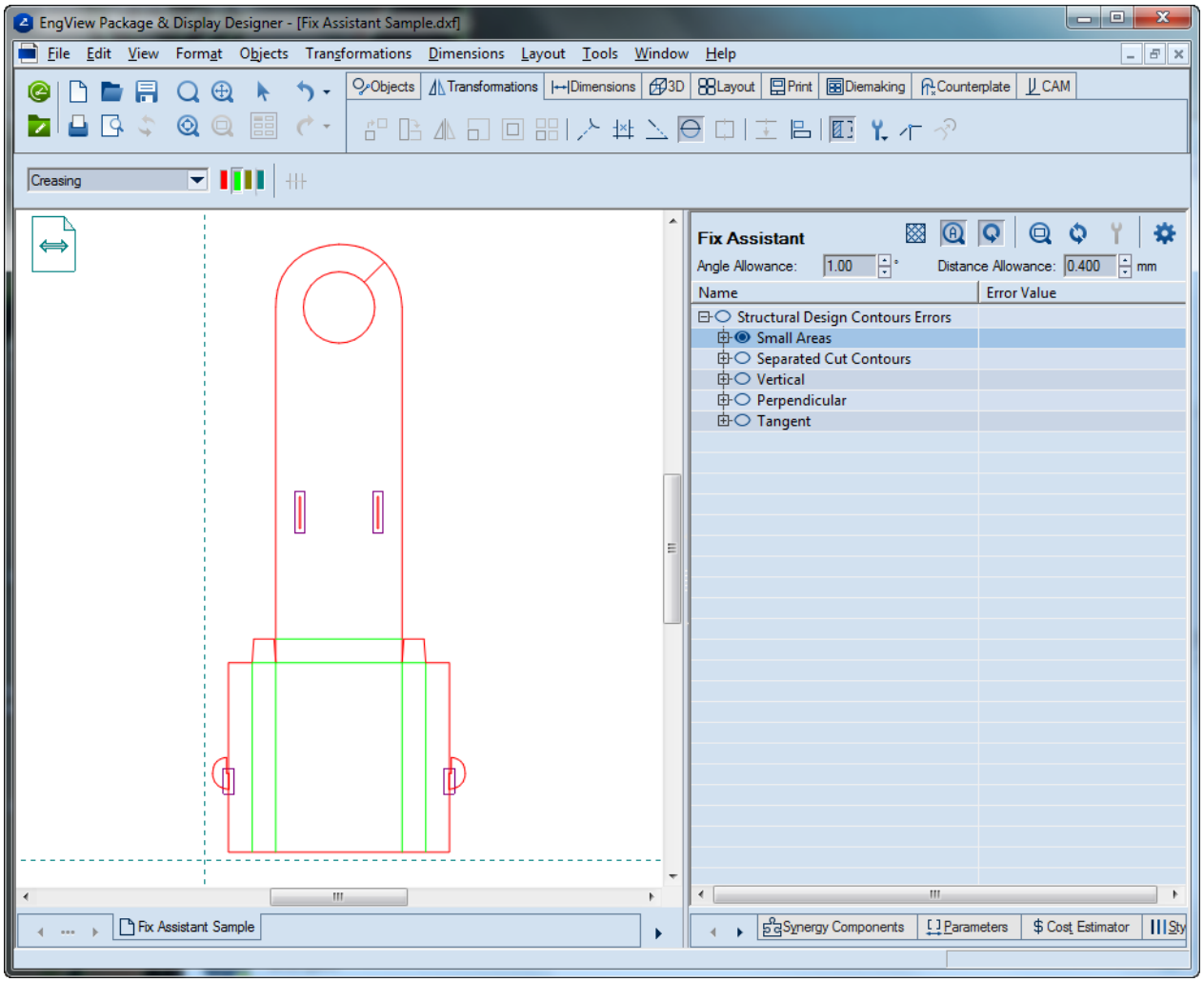


Pic 16: Breaking the line with a Creasing style.

Inspecting small-area errors

Next we turn to the small-area errors.

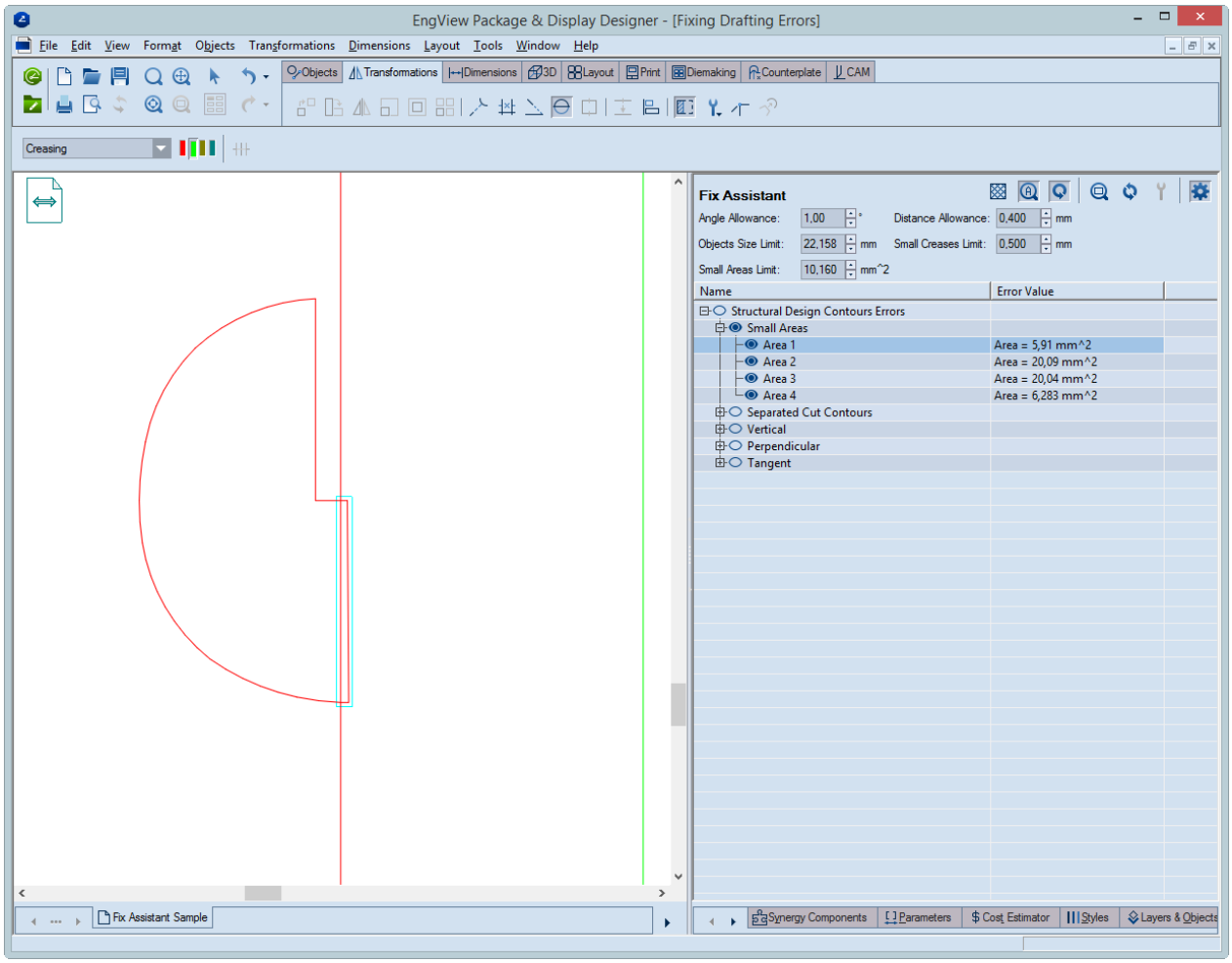
1. Click the eye in front of **Small Areas** group.



Pic 17: Small areas

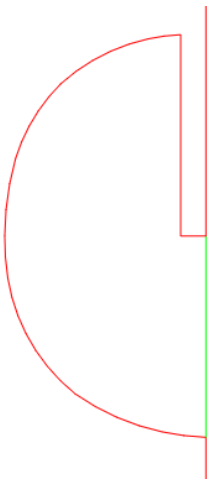
We will inspect the small areas one by one.

2. Open the group, and click Area 1.



Pic 18: We are about to remove the area (highlighted in light blue).

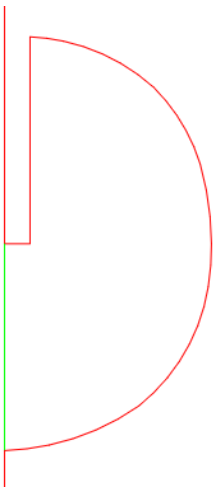
3. This type of errors cannot be fixed automatically. That is why we will do the correcting manually.



Pic 19: The unnecessary objects have been deleted.

There are three small areas left. We will focus on Area 3, ignoring areas 1 and 2.

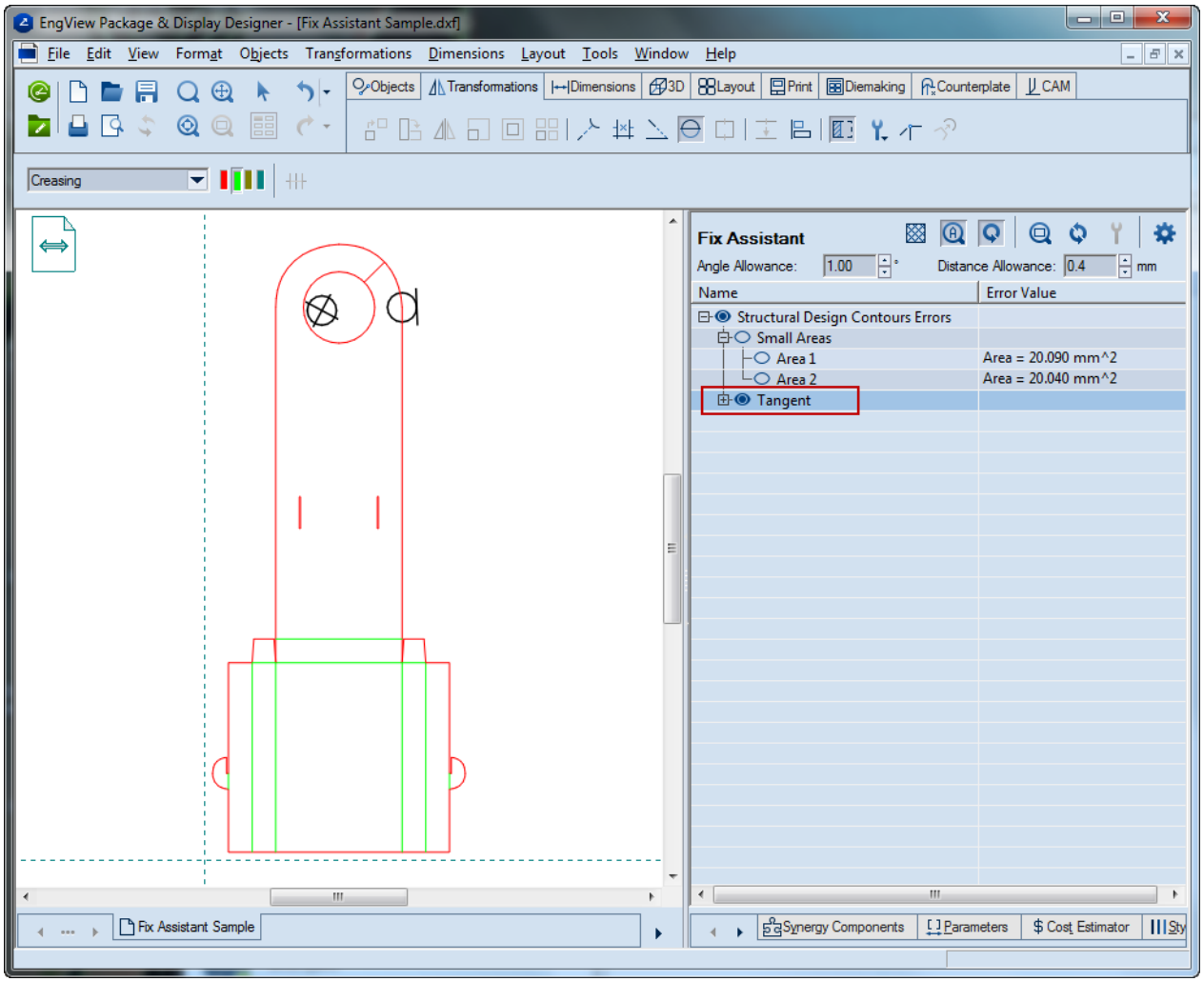
4. Click Area 3 and fix it like Area1.



Pic 20: The unnecessary objects have been deleted.

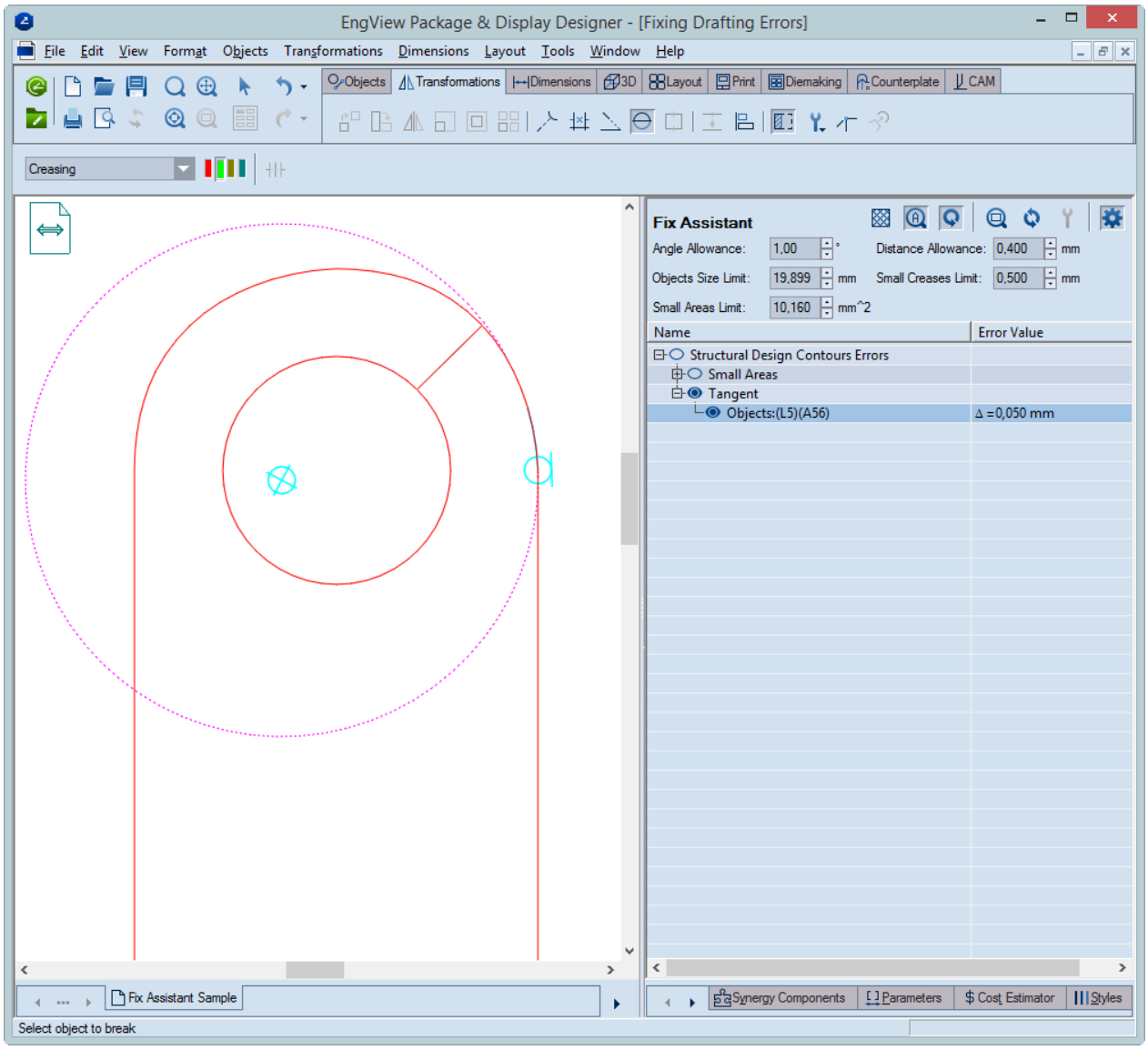
Detecting tangency-related errors

Now we turn to the last type of detected errors: those with incorrect tangency.



Pic 21: Indicating tangency-related errors

We see only one error here, and it shows that the objects L5 (line 5) and A56 (arc 56) are not tangetial.



Pic 22: The objects Line 5 and Arc 56 are meant to be tangential, but actually are not.

As you can see in the **Error Value** column, the value of this error is insignificant — 0.05mm — and we can leave the drawing as it is. If we choose to correct it, we need to re-draw Arc 56.

We have inspected all the detected drafting errors according to the set criteria, and we have corrected the ones we saw as critical.

5. To continue work, turn off the Fix Assistant functionality.