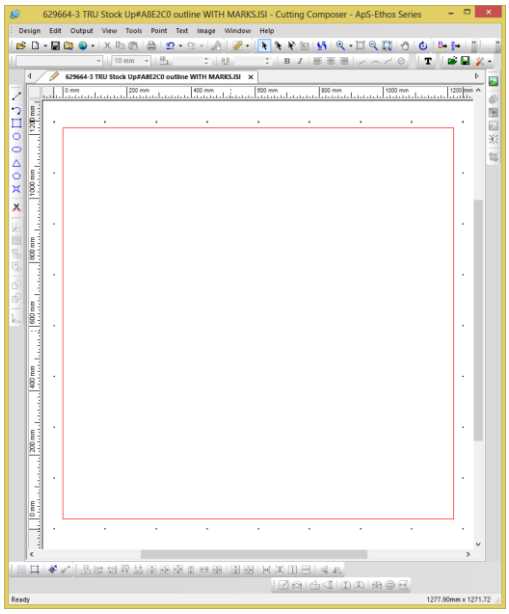
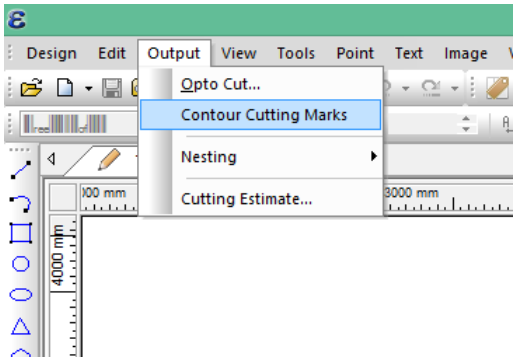
Contour Cut Optocut

The Contour Cut system is an extension of the normal optocut system, using a camera to pick up registration marks on the bed of the machine and modify the design so that the shape cuts correctly on the fabric.

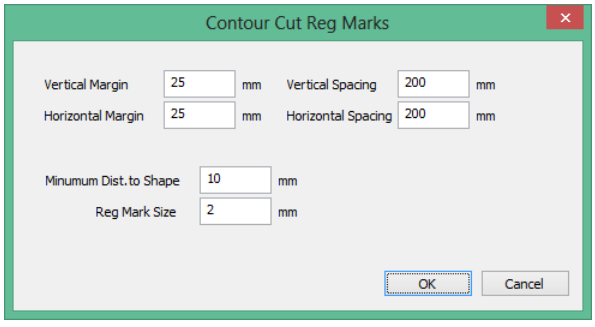


Using the Contour Cutting Marks Tool

The Reg Marks need to be placed on a grid, with the data inside the grid. We have now developed a new tool to assist the placement of the Reg Marks.



When this option is selected, a Dialog box is shown with details for the grid lines:

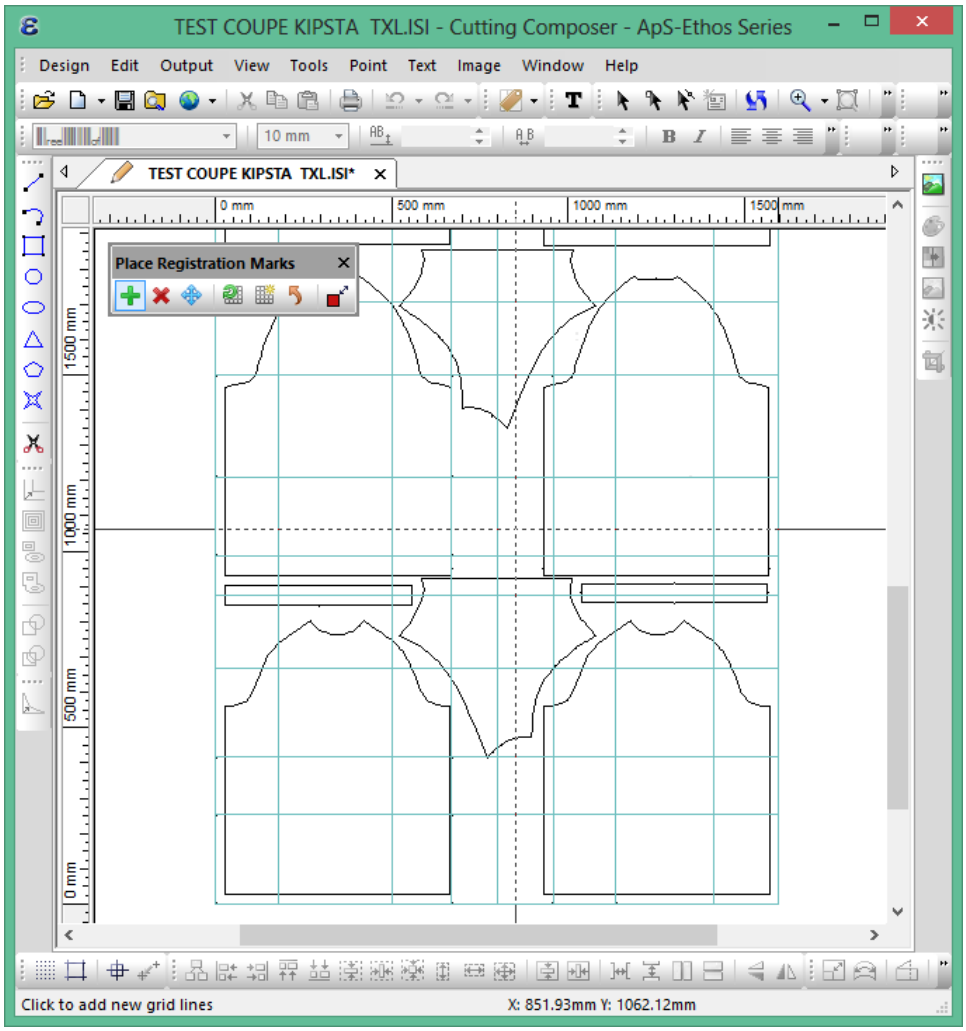


The box allows the grid details to be specified:

- Vertical Margin; this is the distance from the top and bottom of the design to the Reg marks
- Horizontal Margin; This is the distance from the side of the design to the Reg marks.
- Vertical Spacing: this is the nominal spacing vertically, the software will try to optimise this.
- Horizontal Spacing: this is the nominal spacing horizontally, the sofwtare will also try to optimise this.
- Minimum distance to shape: this is the minimum acceptable distance from the Reg Mark to any part of the cut. This is specified so there is no confusion for the camera if the Reg Mark is close to the cut line.
- Reg Mark Size: this is the size of the Registration mark on the design.

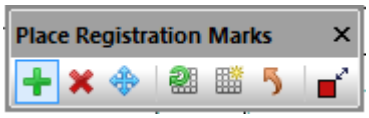
Click OK and the grid lines will be created.

The picture below shows the grid lines lines that are created for this design



Using the Reg Mark Toolbar

The Reg Mark Toolbar shows several functions that can be executed while using the Reg Mark Tool:

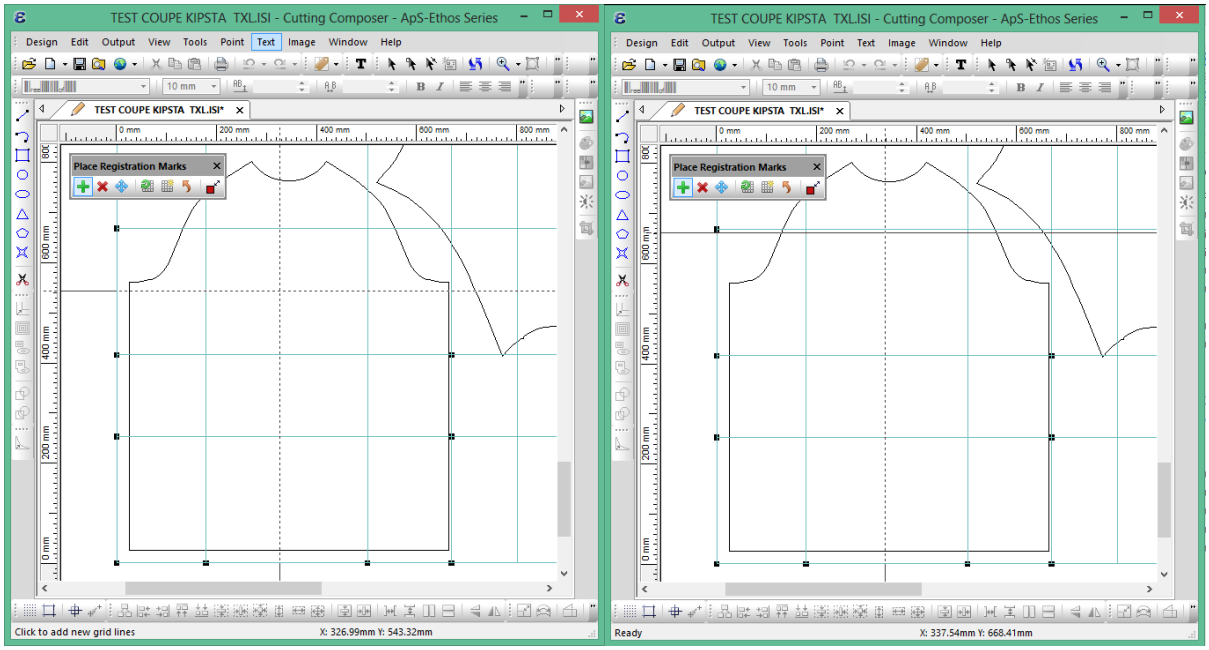


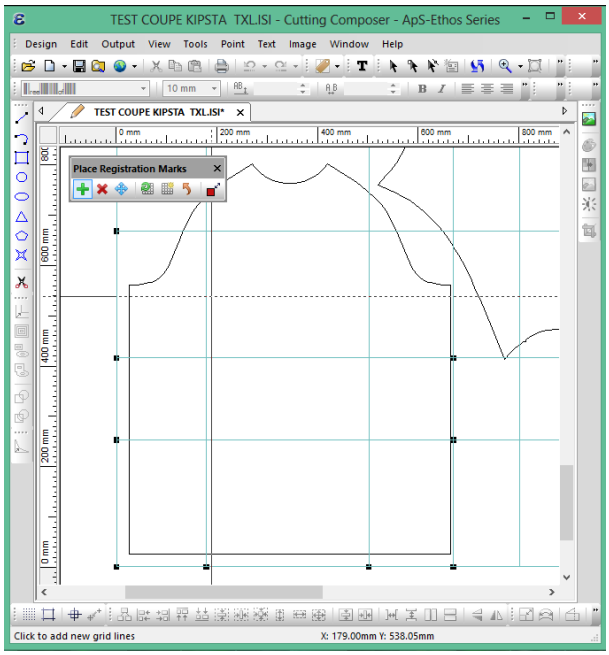
To use this tool, the user can select the appropriate button on the toolbar, or press a suitable key:

- Add, or press ‘a’ or ‘A’: this will allow extra lines to be added
- Delete, or press ‘d’ or ‘D’: this will allow the lines to be deleted
- Move, or press ‘m’ or ‘M’: this will allow lines to be moved
- Generate, or press ‘g or ‘G’ : this will gerenete the Reg Marks based on the interesction of the grid lines.
- New, or ‘w’ or ‘W’, creates a new Grid
- Revert, or ‘r’ or ‘R’ is NOT undo, it goes back to the original lines before any changes where made.
- Toggle Size, or ‘t’ or ‘T’

Add

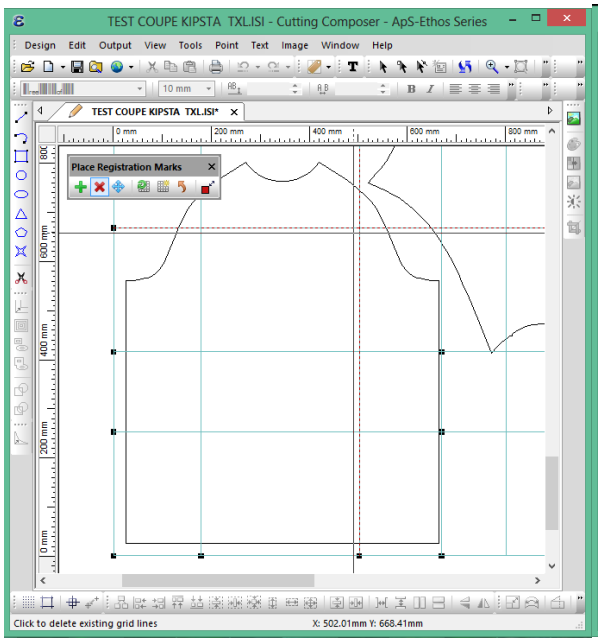
Selecting the Add icon, or pressing ‘a’ or ‘A’, shows a large cross hair on the screen. If the line is dashed it will add a line either a vertical or horizontal line. If both lines are dashed, then a vertical and horizontal line is added:

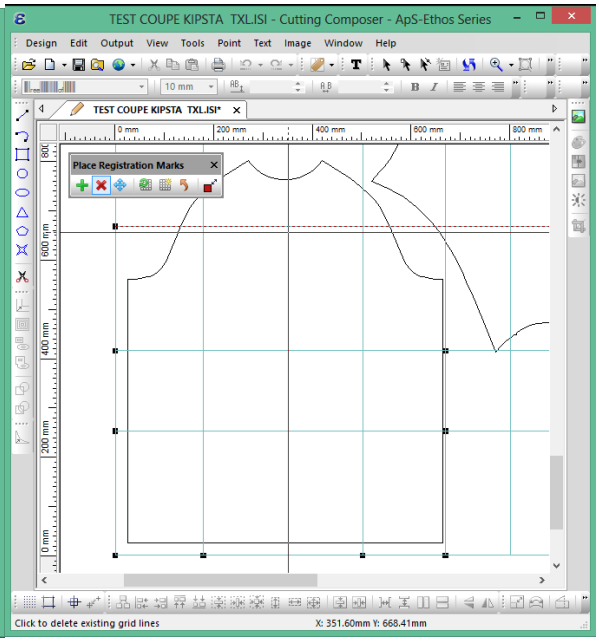


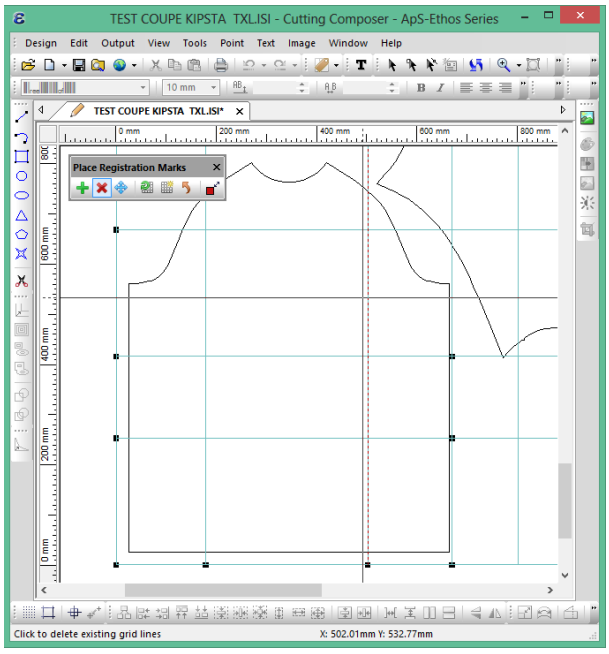


Delete

Selecting the Delete Icon, or press ‘d’ or ‘D’, will show the large crosshair. If the line is near the cross hair is solid it will delete the vertical or horizontal line, if both of the lines (vertical and horizontal) near the crosshair are solid – both of the lines will be deleted.

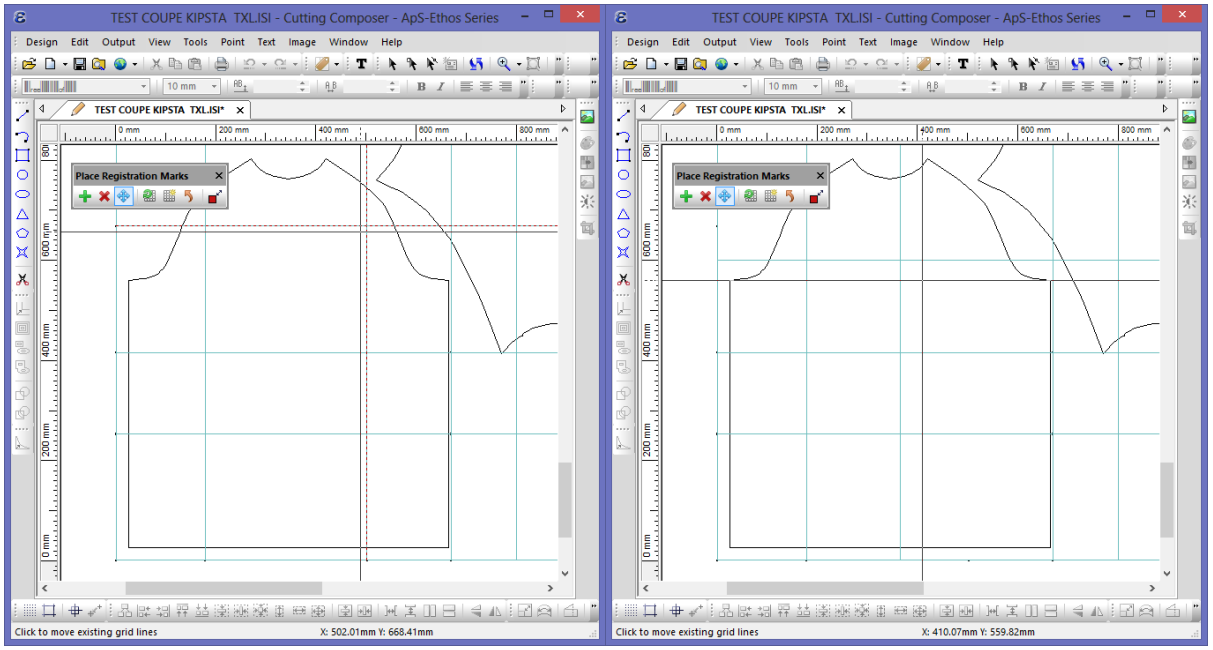


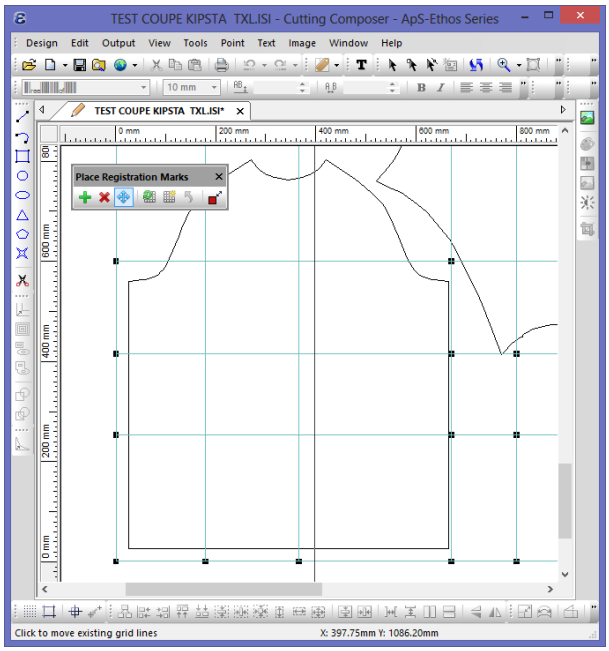




Move

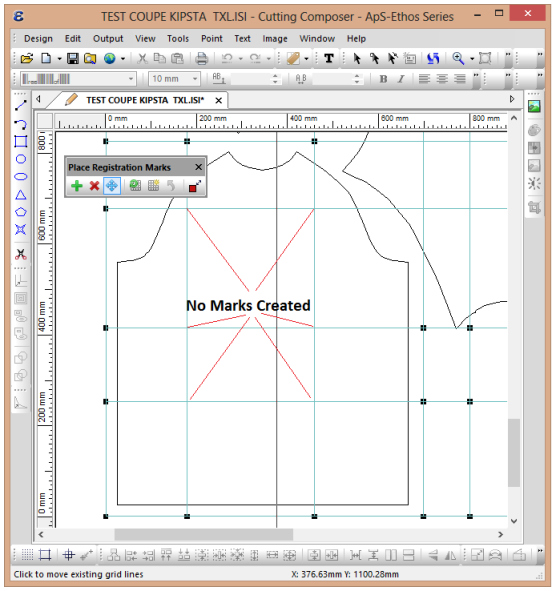
This works similar to the Delete, any line, or lines near the crosshair will be shown as dashed, pressing the left mouse button will then allow the line to be moved:





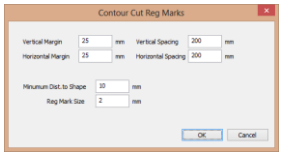
Generate

Pressing the Generate button, ‘g’ or ‘G’, will create the Reg Marks based on the intersection between the vertical and horizontal lines that have been added to the design. If the Lines are edited, Add, Move, Delete, etc, press the Generate button to regenerate the Rag marks. If any lines cross inside the cut shape, no Reg Mark is placed there, because this is part of a garment.

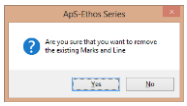


New

Pressing New will show the following form:



This allows a new grid to be created. If there is already a grid attached to the design the following question will be displayed to check the use the user has not selected this option accidentally:

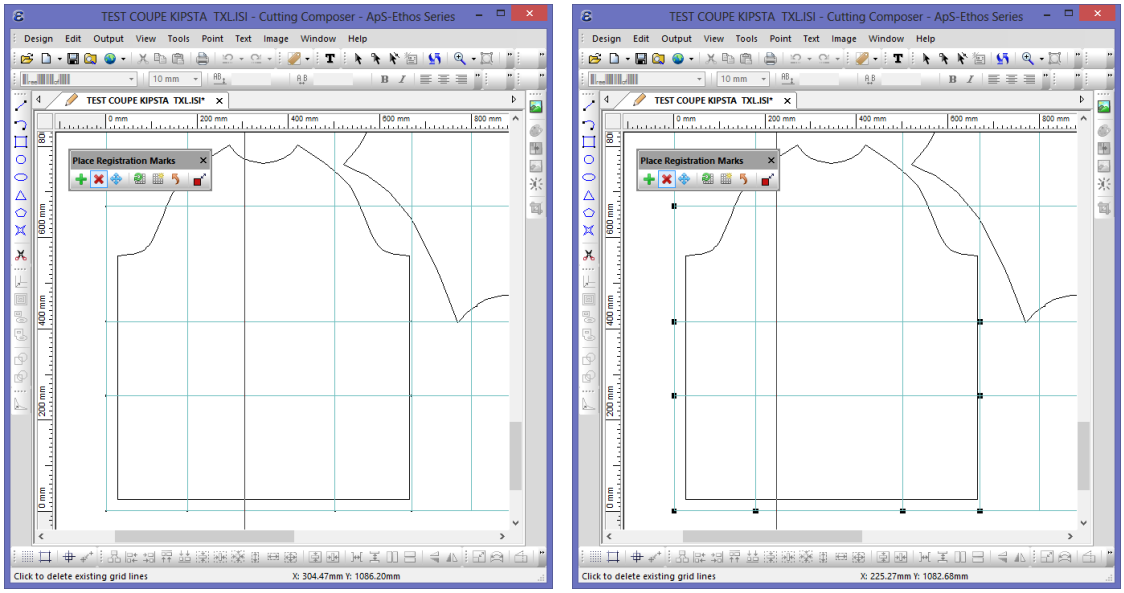


Revert

Revert will undo the last actions that be been made, for example move, delete, add.

Toggle Size

The Toggle Size option will make the Reg Marks 5 x the original size. So, if the Reg Mark is set at 2mm, then the Toggle Size will show them at 2mm or 10mm, see below, the picture on the left shows the normal Reg Marks at 2mm, and the one on the right shows the Large Reg Marks at 10mm:



This makes it much easier to see the Reg Marks when setting the Reg Mark pattern.

Pressing the Right Button mouse to exit from the Reg Marks tool will regenerate the marks at the smaller size.

Manual Placement of Reg Marks

If the registration marks are being placed on the design using another program, then the following guidelines must be followed:

Registration Mark size: 2 - 3mm (normally 2mm is sufficient)

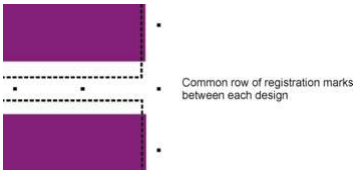
Distance from Reg Mark to shapes: 10mm minimum. This is to make sure that the camera does not pickup the printed shape and get confused.

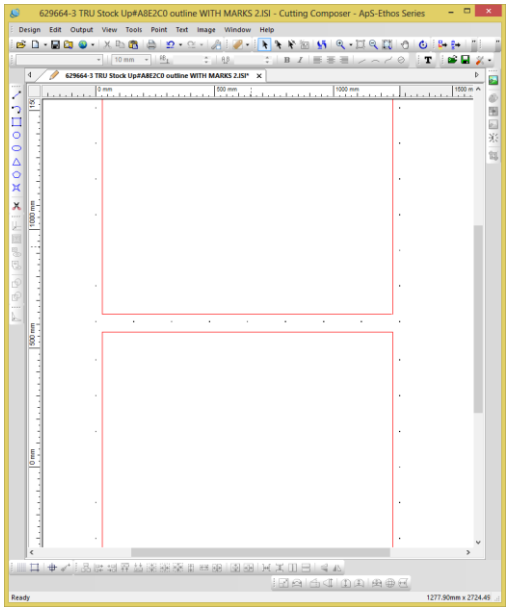
Distance from edge of fabric to Reg marks: 10-20mm minimum. This is so that the camera does not pick up the edge of the material, or the bed, when looking for Reg marks on edge of the fabric. This will tend to confuse the camera.

ALL registration marks must be on a grid, they must all perfect horizontal and perfectly vertical. This is very easy to do with both Adobe Illustrator and Coreldraw.

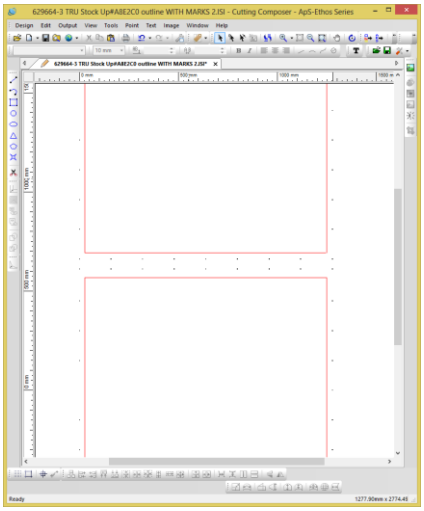
Repeating Designs

When printing a repeat, the easiest method is to make sure that the first row of reg marks for the next design are exactly on to of the last row of reg marks for the previous designs. This should be quite easy to do when printing, see below:

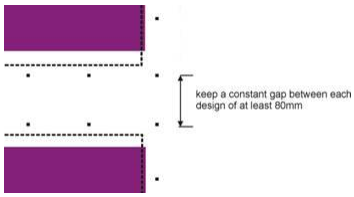




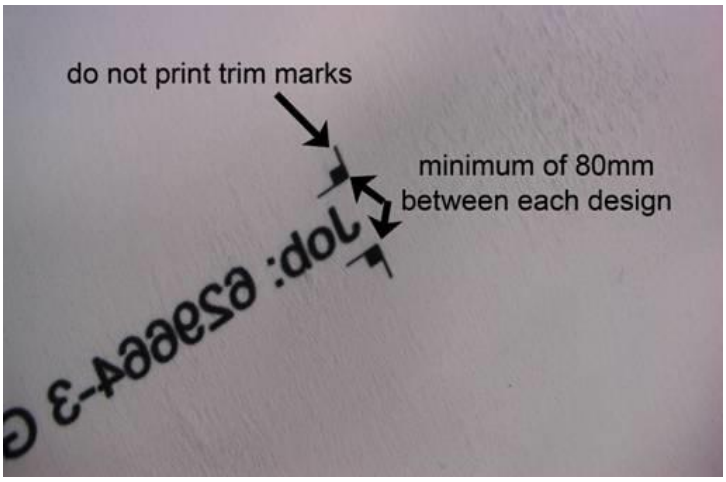
If you cannot do this or the printing process is more complex, make sure that there is at least 25mm to 80mm distance between the registration marks. If the fabric is unstable in the Y direction, allow more distance between the reg. marks. Once the Repeat Gap has been chosen this must be the same for all repeats (with 1 or 2mm), because the camera uses this offset to automatically search for the Reg mark to cut the next part once the material has been cut and fed :

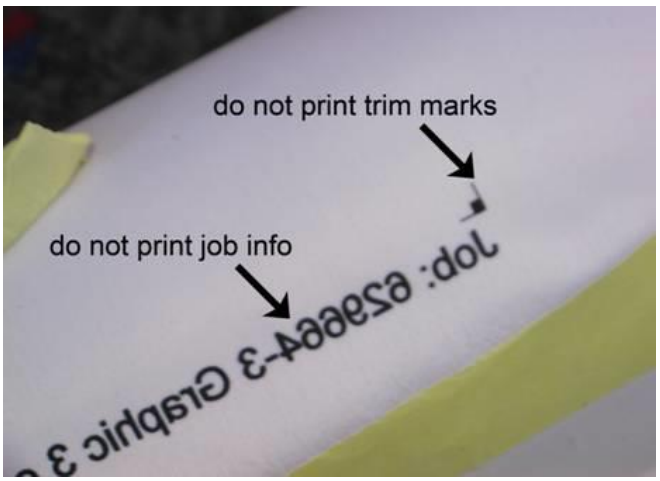


If possible use a common row of registration marks between each design, this works well for the camera software as there is only 1 mark to pick up even if the fabric is quite distorted.



Hints for marks:

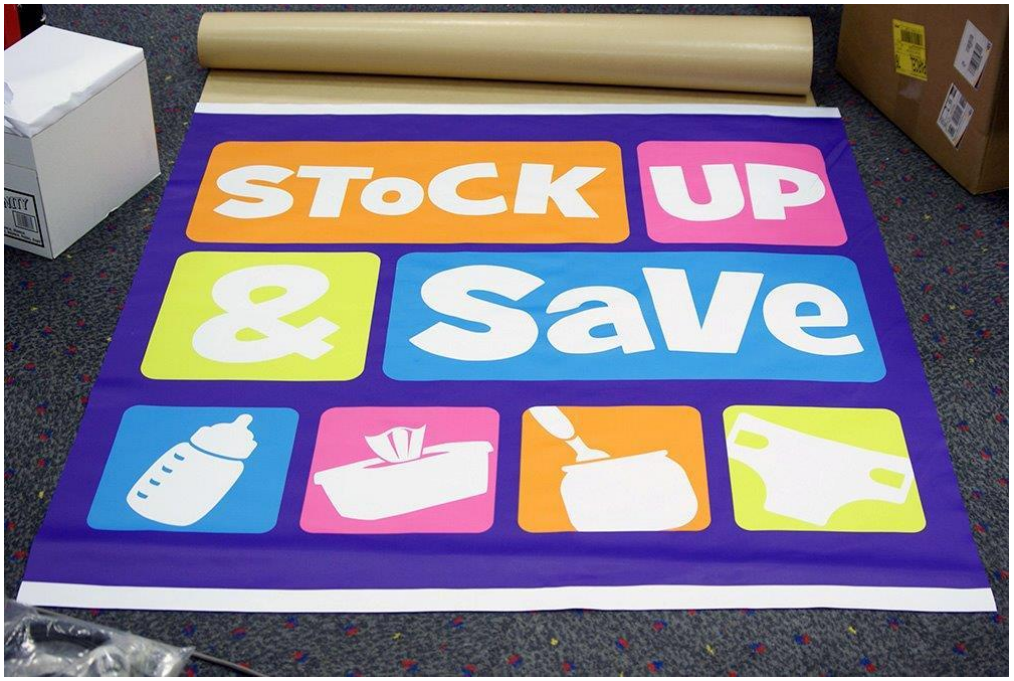




Typical cutting application

Below are 2 pictures, the one on the top shows the fabric on the bed, note the curve at the bottom of the banner. The software picks up the Registration marks, transforms the design and sends the cut data which matches the distortion on the bed. This mean that when the banner is removed the cut is parallel to the bottom edge of the print – see picture on the bottom.

Print on the Bed of the FB Laser Cutter



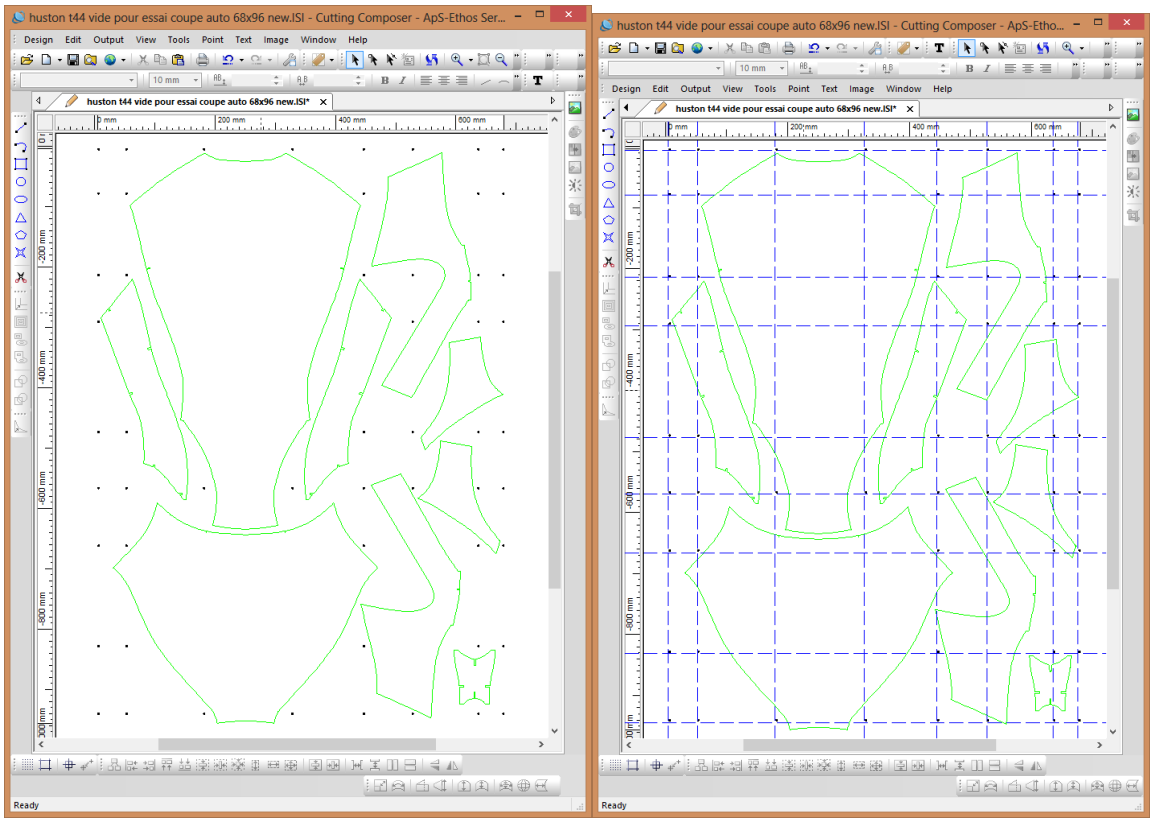
Cut Job removed from machine

Typical non-banner Multipoint application (Advanced Applications)

The drawing on the left shows the points on the design, the drawing on the right shows the blue dashed lines which show the “Grid” applied to the design. The “Grid” should be setup so that there are several Reg. marks around each component. The software uses these Reg. marks to determine how much the material has moved and so, how much to distort the vectors that it is cutting. If any mark is going to be too close to the edge or inside the garment panel, then remove that point, the software will then create a “phantom” point which is will use for the distortion.

We have to compromise the number of points with the time take to register and the accuracy needed in the cut. The more points, the more accurate, but the longer it will take to register. It is much better to have more points on the printed fabric, because the extra points can be removed from the design when loaded into Ethos and then software will no longer look for these deleted points, even though they are still printed on the fabric.

As can be seen below, all of the reg marks must be on a grid, and they must be perfectly vertical and horizontal. For example if the reg mark is 2mm, then select a row of reg marks, the height should be exactly 2.0mm, select a column of reg marks and the width of the column should be exactly 2.0mm. If the reg marks are not vertical and horizontal, the program will not include them and this could lead to errors in the output.



[Optocut]

- Contour Cut	
Optocut Check Vertical First=1	Def 1 - if "flag" type go round the outside of the shape not side to side
Optocut Max Zoom=1	Def 0 - Set the procesed image to the max size 192x192 not 128x128
Optocut AutoSearch=0	Def 0 - Auto search for points
Opto Max Search Window=90	Def 90 - %age of Visible area when AutoSearching
Opto Search Distance=128	Def 192 - distance the camera moves to autosearch
Optocut Number of Cut Waste=1	Def 1 - Number of cut waste lines - can be 2, 3 etc
Optocut Cut Waste Offset=100000	Def 100000 - cut waste is 100mm above first reg mark
Optocut Scroll Grab=1	Def 1 - Move the camera to the new position and grab again
Optocut Filter Output=1	Def 1 - Filter output before sending to cutter
Cut Waste with Open Vectors=1	Def 0 - allow open cut waste to be created with Open Vectors
Optocut Return to First Point=1	Def 0 - go back to first point ready to cut
- For Processed Image	
Optocut Filter Pixel Line=1	Def 0 - Filter the processed image data to get rid of 1 pixel lines and dots (TESTING)
Optocut Ignore Touching Line=0	Def 0 - if set to zero ignore when the dots touches the side (TESTING)
Optocut Vectorise=0	Def 0 - vectorise the processed image to look for shap matching (TESTING)
- Optocut	
Optocut Check ALL Reg Marks=1	Def 1 - Re check the first point after first alignment
Opto Dynamic Index=0	
Opto ScanCut=0	
ScanCut MultiScan=0	
Opto Adaptive Feed=0	
ScanCut Reg Mark Match Count=0	
Optocut Register Last in X=1	Def 0 - Normal badges didn't have reg mark in last column
OPTO Cut Pt3 Below=1	Def 0 - Used for Jacquard Weavers
Optocut Test Offset mm=0	Def 0 - used to check backlash - move off and back
Optocut Test Offset=0	Def 0 - used to check backlash - move off and back
- contour mark creation	
OPTO CC Vert Margin=25000	
OPTO CC Horiz Margin=25000	
OPTO CC Vert Space=75000	
OPTO CC Horiz Space=75000	
OPTO CC Min Dist=10000	
OPTO CC Mark Size=2000	
OPTO CC Large Mark Size=10000	
OPTO CC Largeark Size=10000	
Mesh Line Min Length=10000	
Mesh Line Split Length=5000	
Debug Reg Marks=1	