Contents

1. Using the In-Sight Vision Suite Bead Inspection Tools

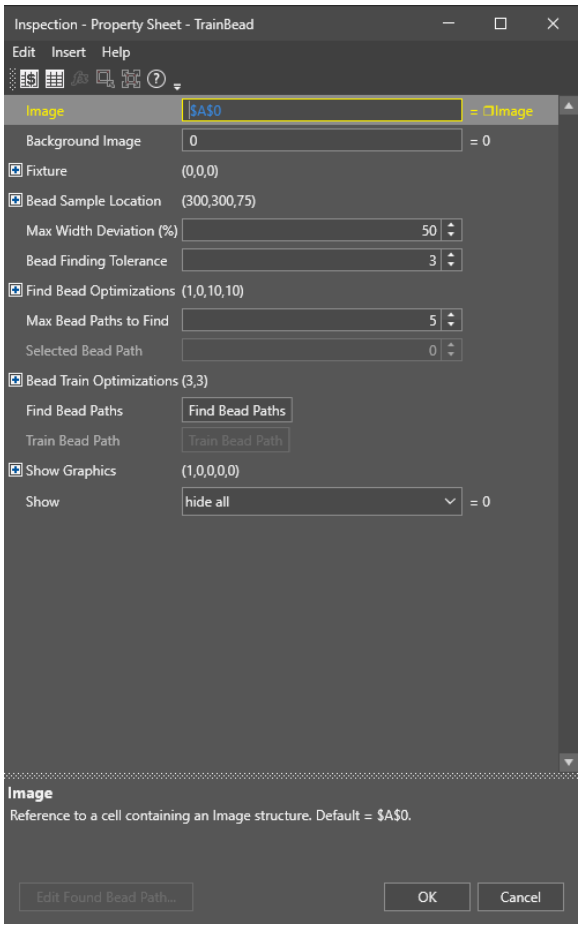
With the 25.1 release of In-Sight Vision Suite (ISVS), the **Bead Inspection** tools are in the vision tools set. This now allows you to easily train and inspect bead paths for your 2D Spreadsheet-based applications. The typical workflow is to define the bead path that needs to be inspected and then have the inspection reference that bead path when making its evaluation.

1.1 Defining the Bead Path

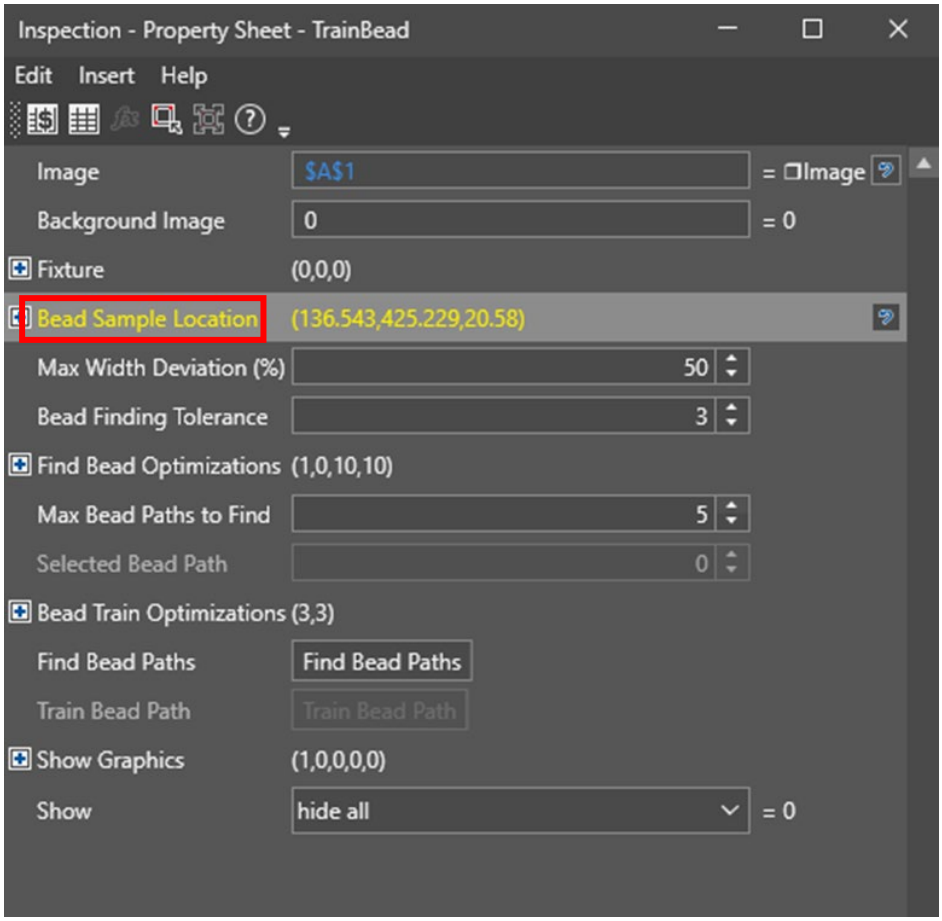
To define the bead path, drag the **TrainBead** tool into your spreadsheet job.

	Beads	Trained	Color	Width	Contrast	Search Width
TrainBea	1.000	1.000	1.000	22.167	18.000	22.550

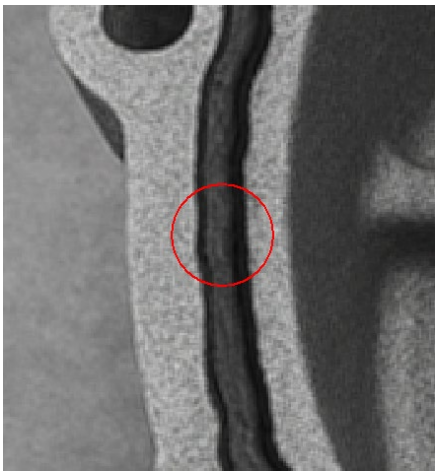
The dialog box will appear.



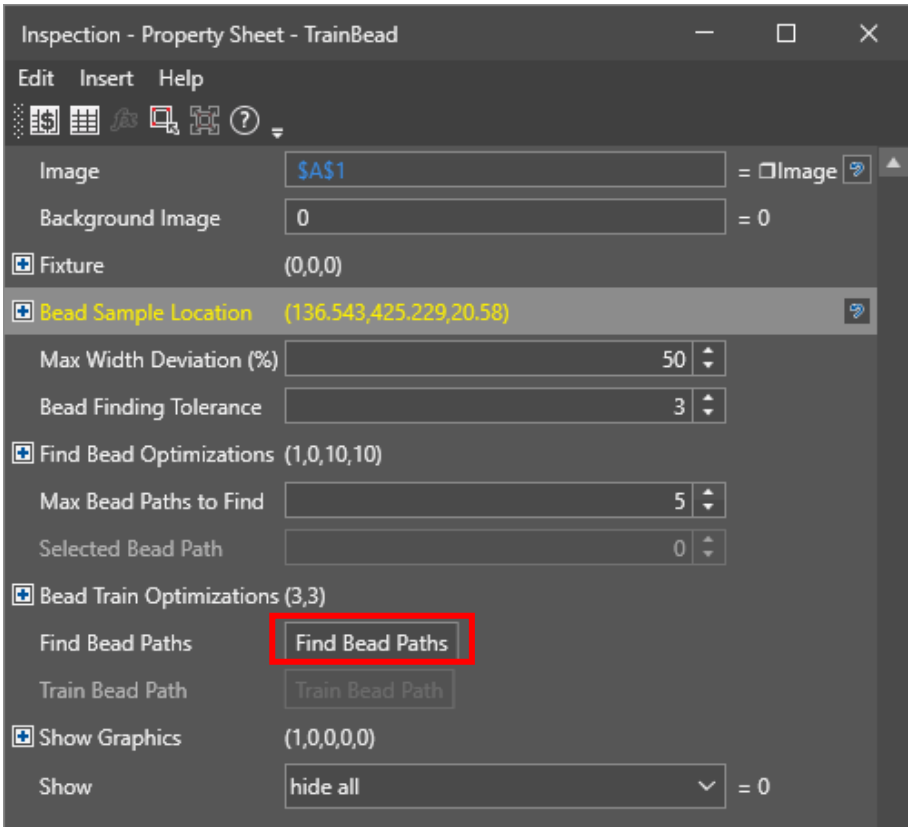
From here, double click the **Bead Sample Location**.



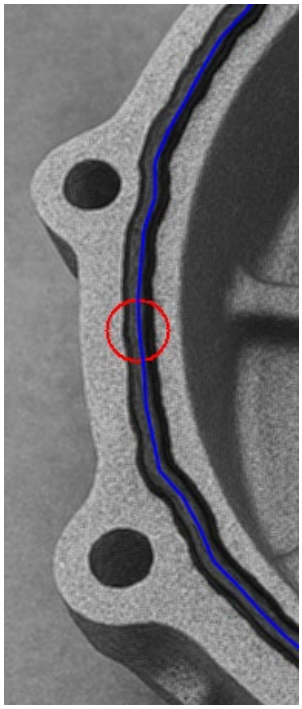
Adjust the circle ROI to enclose the bead with both edges falling within the circle bounds. Best practice is to keep the center of the bead towards the center of the circle. When finished, press Enter.



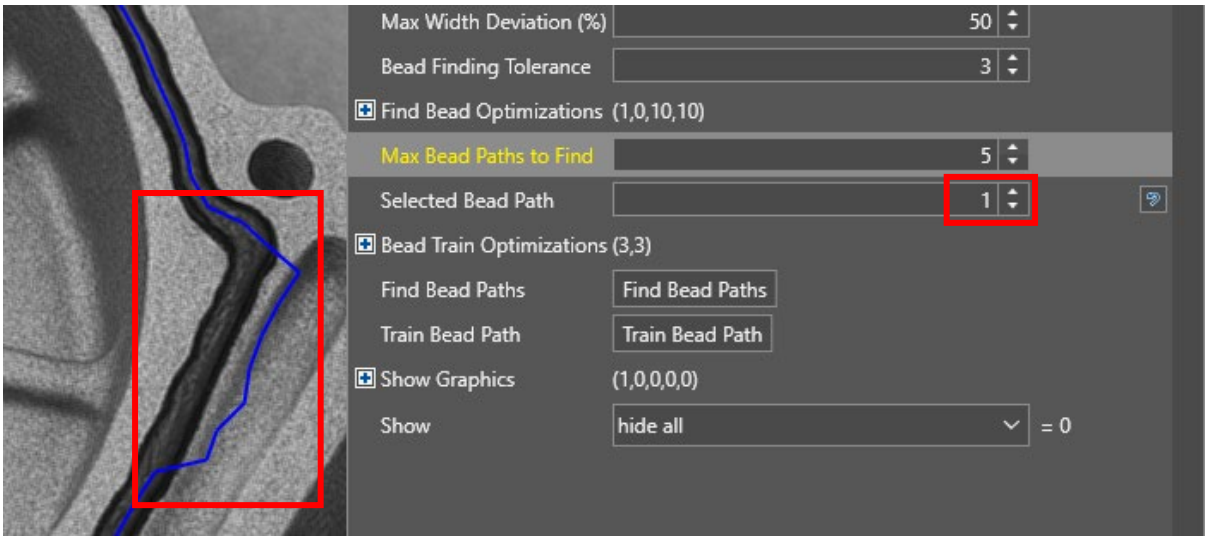
Click **Find Bead Paths**.



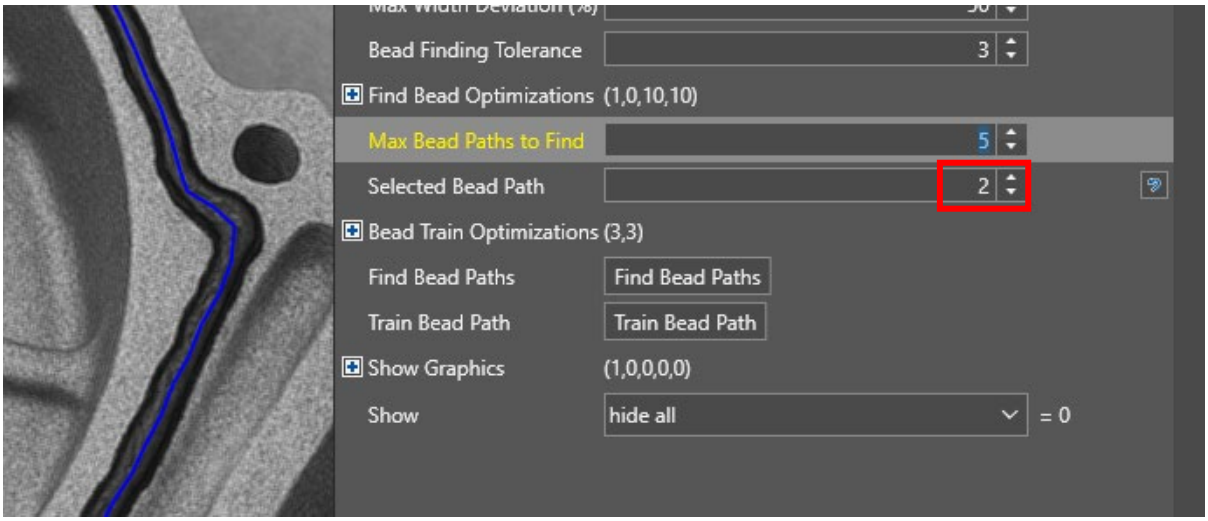
This will automatically try and find the correct path by generating multiple paths for you to choose from. By default, the max number of paths generated is **5**.



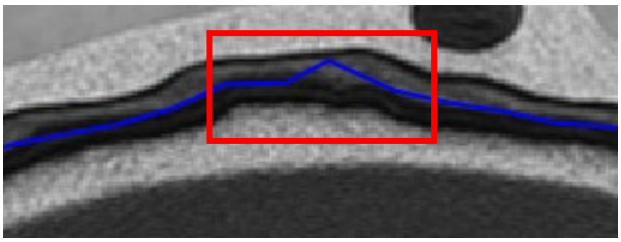
If you encounter paths that don't appear to be correct, try to find one that better fits the correct path. To do this, increase or decrease the **Selected Bead Path** number and click out to see if the next bead path is closer.



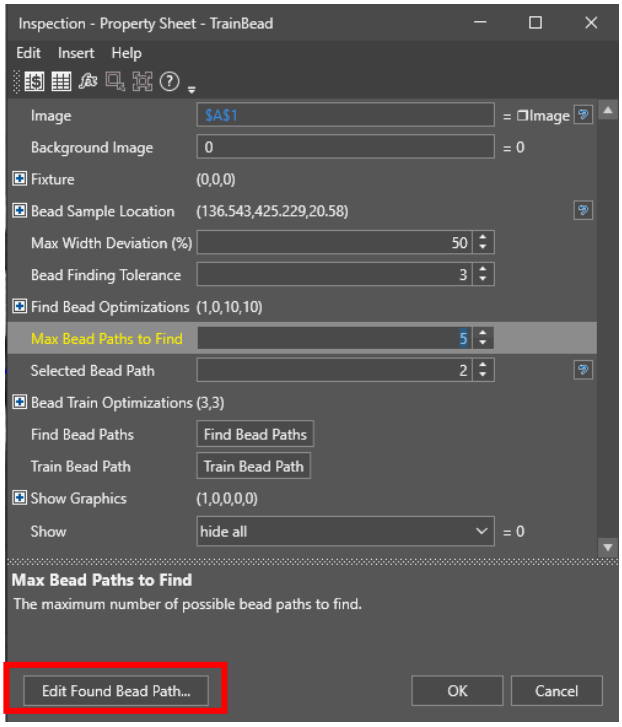
Note: Remember to click out of the editable input to see the changes take effect.



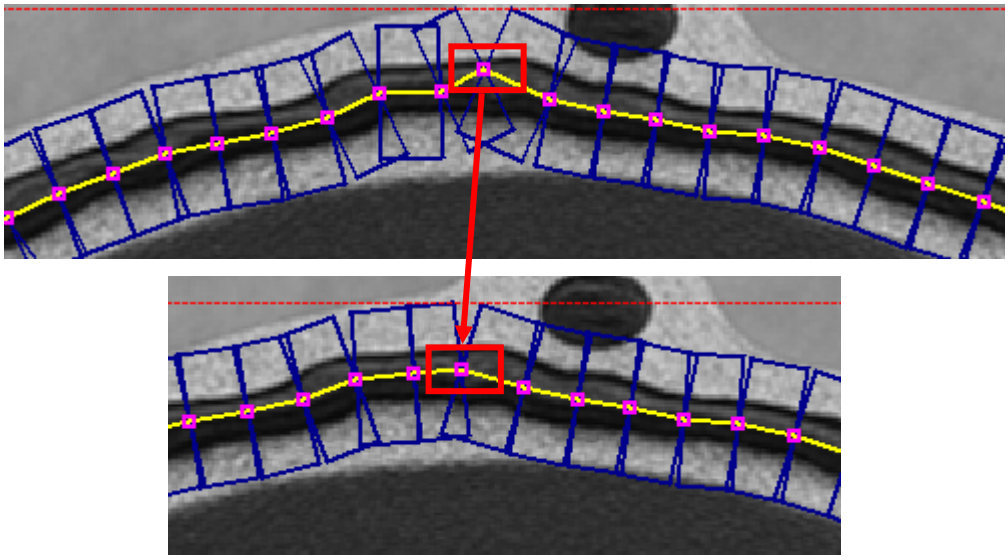
Sometimes the bead path found might need fine-tune adjustments.



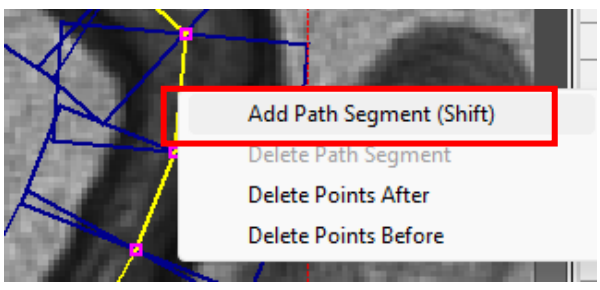
You can manually adjust the bead path by clicking **Edit Found Bead Path**.



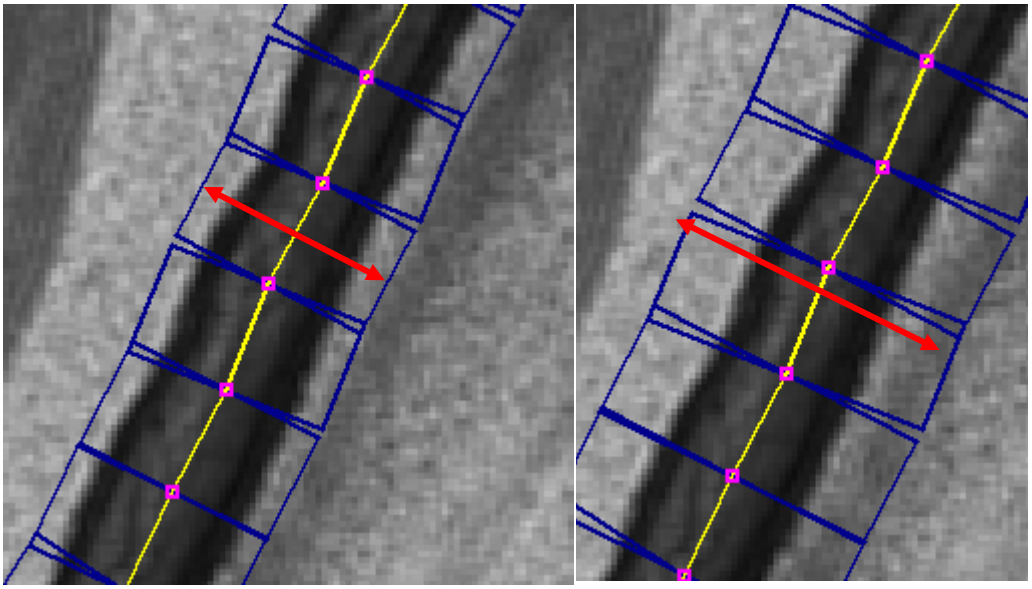
This will show the bead path into separate segments that you can then adjust the nodes (light pink) to get a better fit.



You can right-click on the bead path to add or remove nodes.

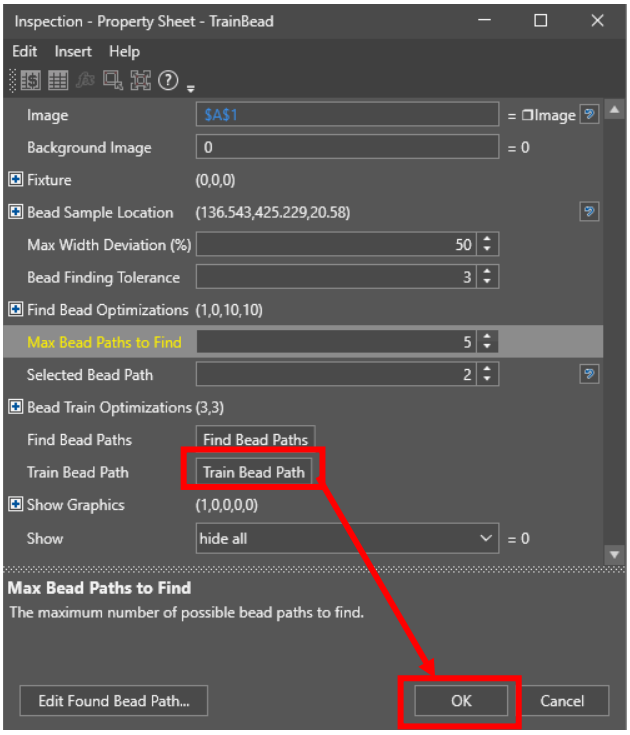


You can also adjust the width of your sub-regions (dark blue) by clicking and dragging on the edges.



After making your adjustments, press **Enter**.

Finally, click **Train Bead Path** to finalize the reference path used during the inspection. Once training is completed, click **OK**.

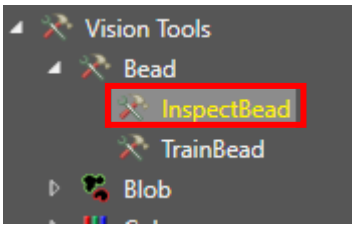


This will now give you the trained bead path to use as a reference in the spreadsheet.

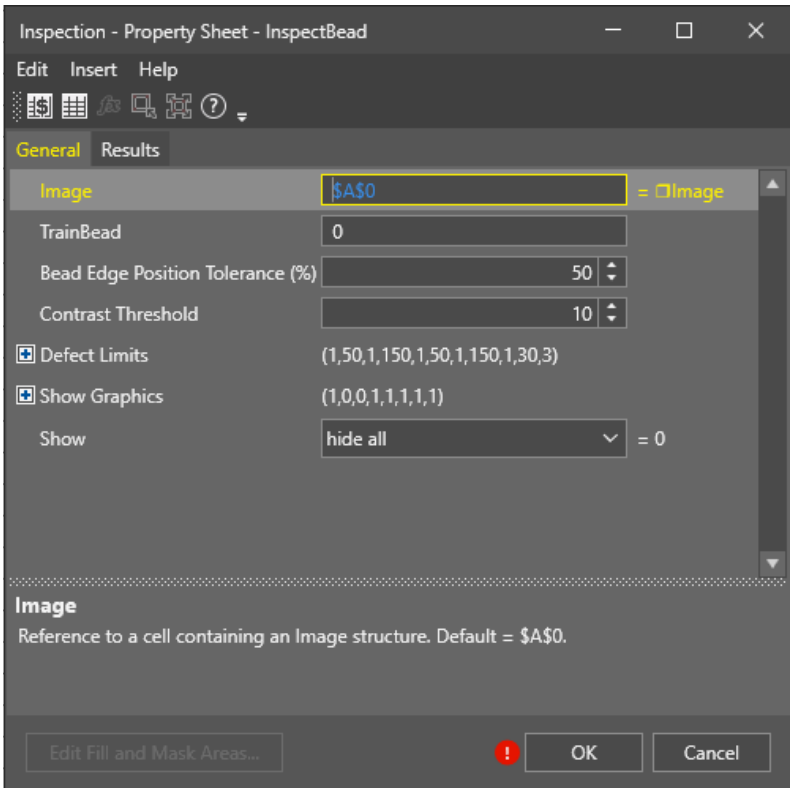
	TrainBea	Beads	Trained	Color	Width	Contrast	Search Width
6		1.000	1.000	1.000	22.148	17.000	22.021

1.2 Inspecting the Bead Path

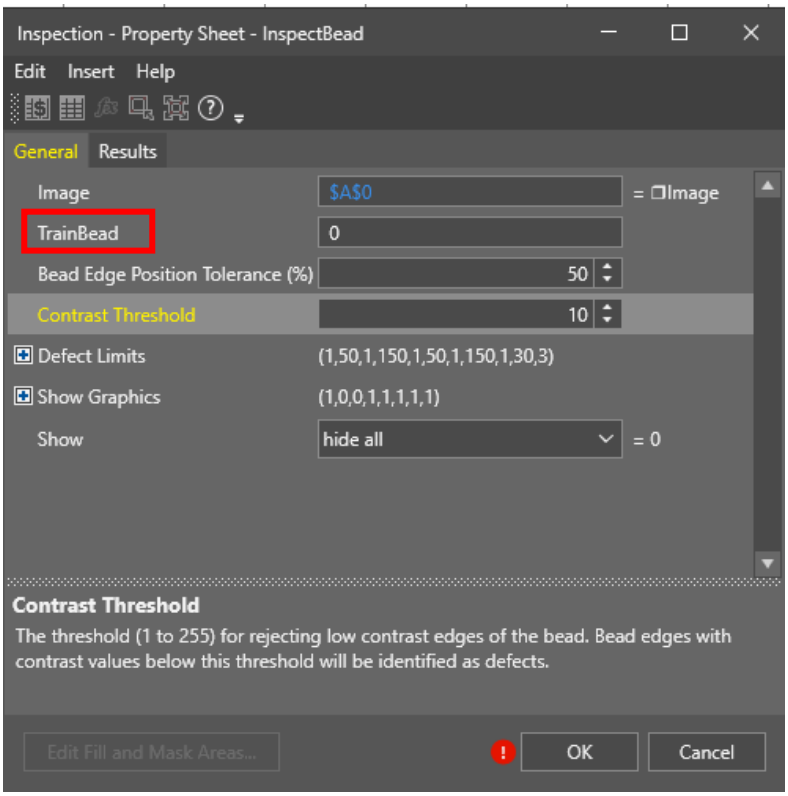
After you train a defined bead path, drag in the **InspectBead** tool into your spreadsheet.

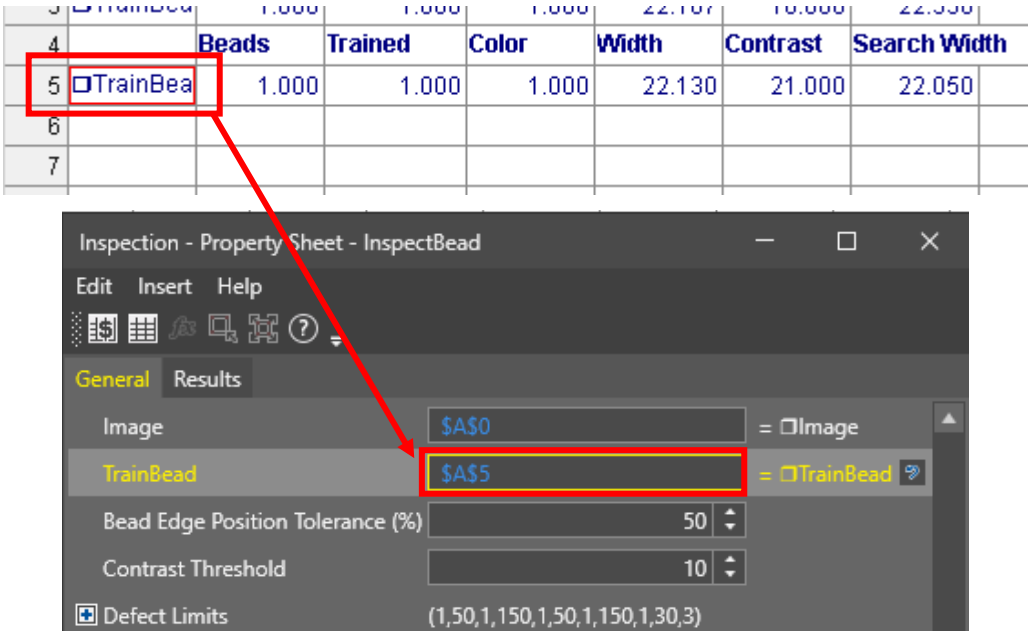


This will populate the following dialog box.

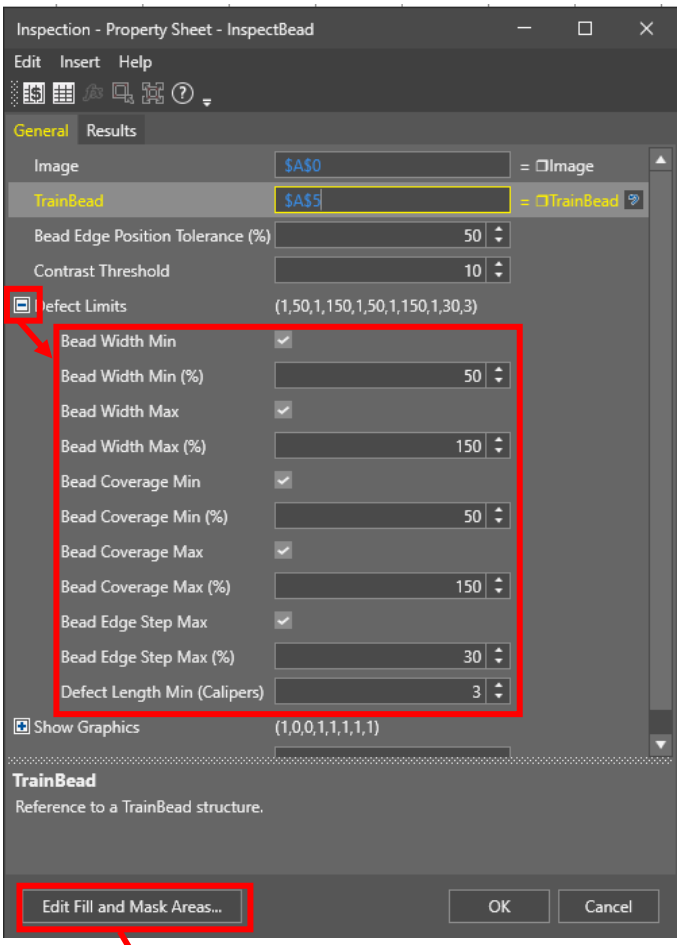


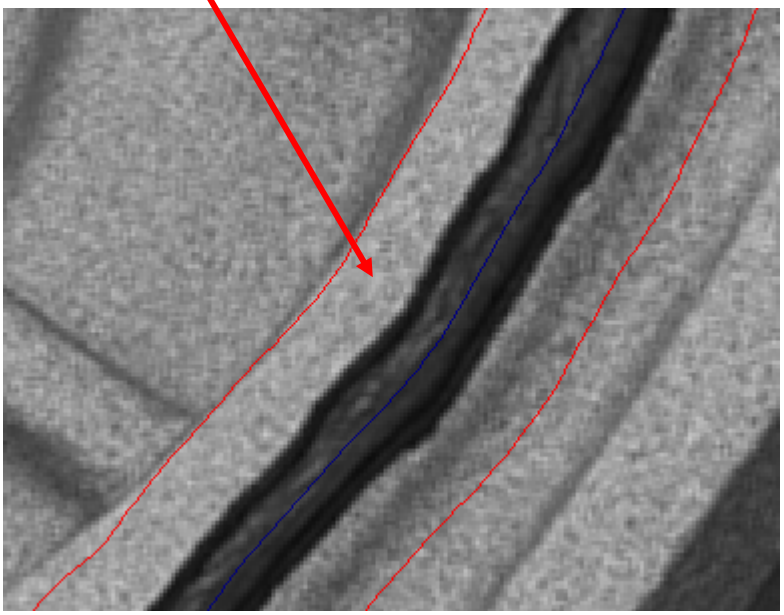
Here, you can reference your TrainBead tool by double clicking **TrainBead** and then selecting your cell containing the trained bead path.



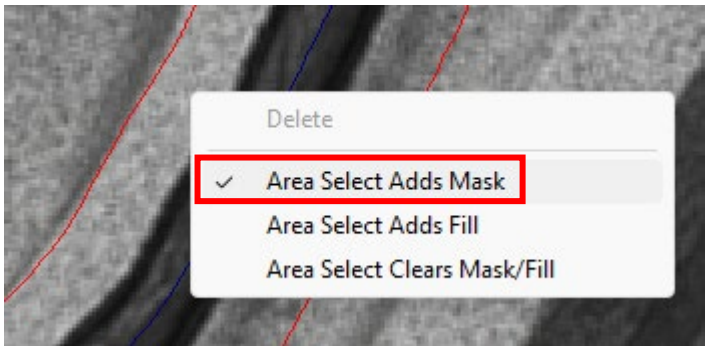


By expanding the box for **Defect Limits**, you can adjust properties of how much the bead can vary from the trained bead path to limit what variations are allowed. If you need to apply a mask inside the inspection area, click **Edit Fill and Mask Areas**.

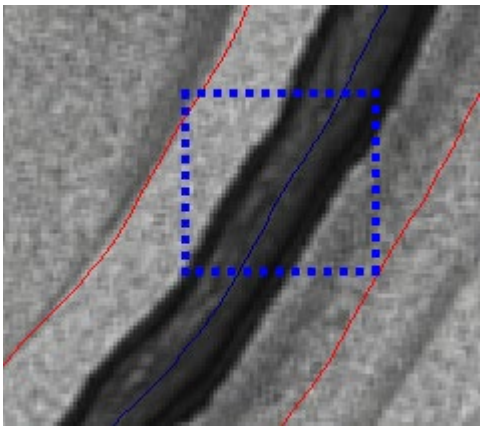




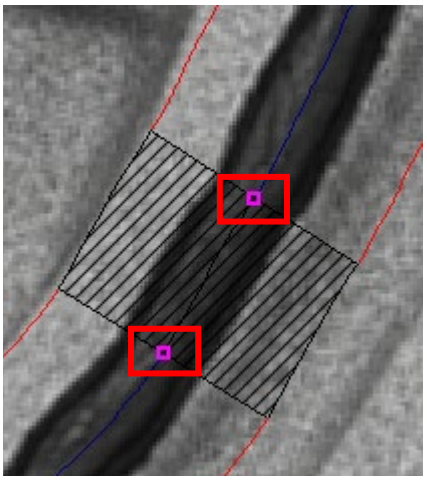
This will show the bounding area around your bead (red) and the bead path (blue). By right-clicking on the image, you can select to either add masking inside the path area to prevent that part from the inspection.



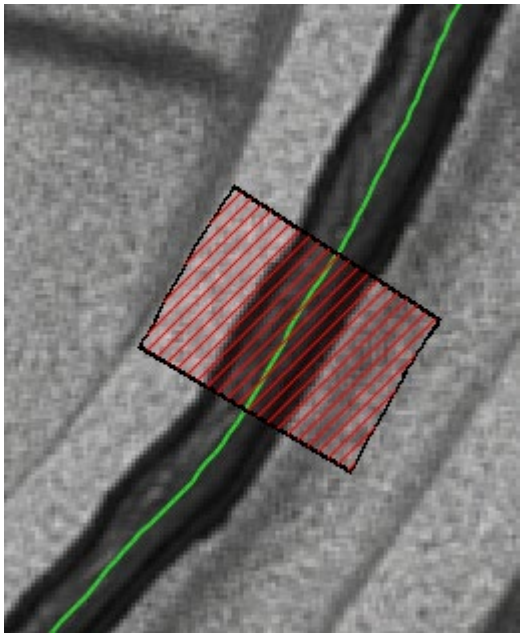
From here, left-click and drag the area you want to start your masking on the bead path.



You will now get a start and end point that you can adjust to create your masking along the bead path.

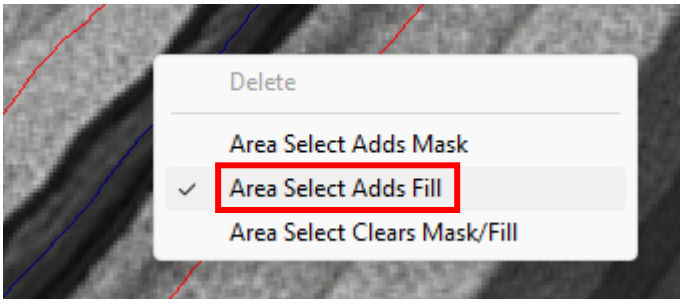


Once you make your masking, press **Enter**. You should now see a preview of the area along your bead path that is masked off with the red boundary.

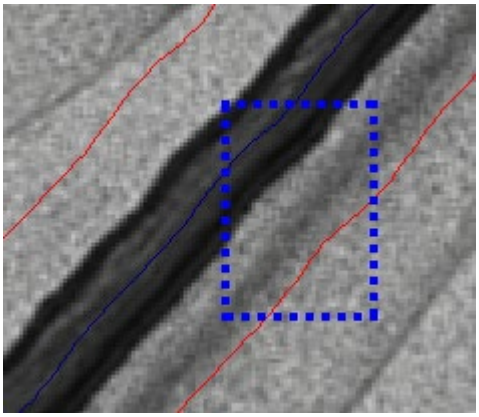


The **Allow Fill Edges** option allows the expected edge of the bead to be used when that edge of the bead is not found but the opposite edge is found.

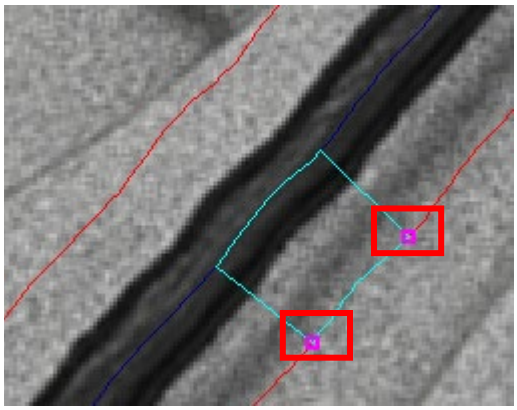
To enable this, return to the **Edit Fill and Mask Options** on the train bead dialog box and right-click on the image. Select **Area Select Adds Fill**.



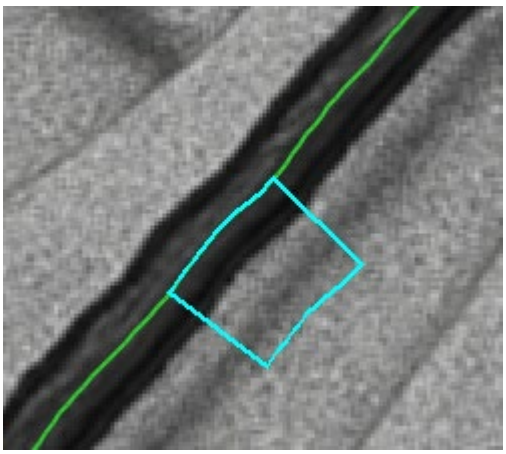
Left-click and drag to get your starting point on the bead path that contains the side you want to fill.



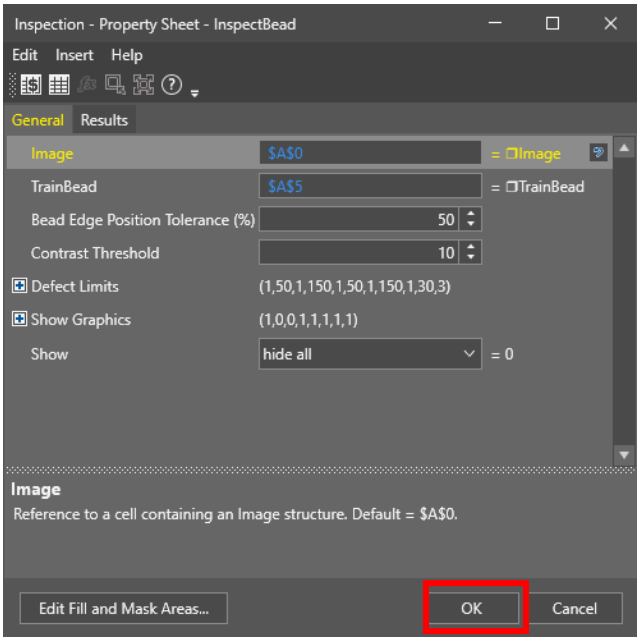
This will give you the starting and ending points for where the fill operation will take place for the side you will allow to be filled if the edge is not found. You can drag these points along the path to size as necessary.



Once you make your changes, press **Enter**. You should now see the area highlighted showing the portion of the path that will allow the fill operation to be used.



Once you make all your adjustments, click **OK** to close.



This will now give you the following in your spreadsheet. Any defects that are found will populate this list that can be referenced by your inspection. By default, only the first 10 defects found will be displayed.

	Defects															
InspectBe	0.000															
	Defects						Bead Width		Bead Coverage %		Contrast		Offset 0	Offset 1	Step Change %	
			Caliper Range				%				Edge 0	Edge 1	%		Edge 0	Edge 1
	Index	Type	Start	End	Length	Area Delta	Min	Max	Min	Max	Average	Average	Min	Min		
	0.000	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR
	1.000	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR
	2.000	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR
	3.000	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR
	4.000	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR
	5.000	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR
	6.000	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR
	7.000	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR
	8.000	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR
	9.000	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR	#ERR