

## *Tangram Technical Note*

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# ***Nominal Points List To Compare***

Rev.	Date	Change Reason
1	10-12-2020	First Release

### **Summary**

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## Overview

Sometimes users who are used to measuring by scanning require to compare a specific number of theoretical points with respect to the obtained curve. This list may not be adapted to manage the measurement path. So, it is an additional list specifically dedicated to comparison. Therefore, a relevant subset of the measured points of the same number of points of the nominal set must be obtained with local interpolation techniques. Furthermore, this set of nominal points and the corresponding extracted measured points can be used to evaluate the best roto-translation that minimizes the deviations.

This new option has been added to the Curve Element only, for the moment. Next, it will be added to other geometries.

## Measured Element tabs

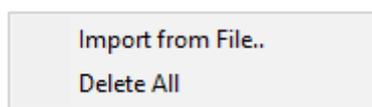
At creation of a new Curve:

Element Curve Creation						
Curve	Nominal Path	Nominal Points				
	X	Y	Z	Cx	Cy	Cz
	0.0000	0.0000	0.0000	0.000000	0.000000	0.000000

Opening an existent Curve Element:

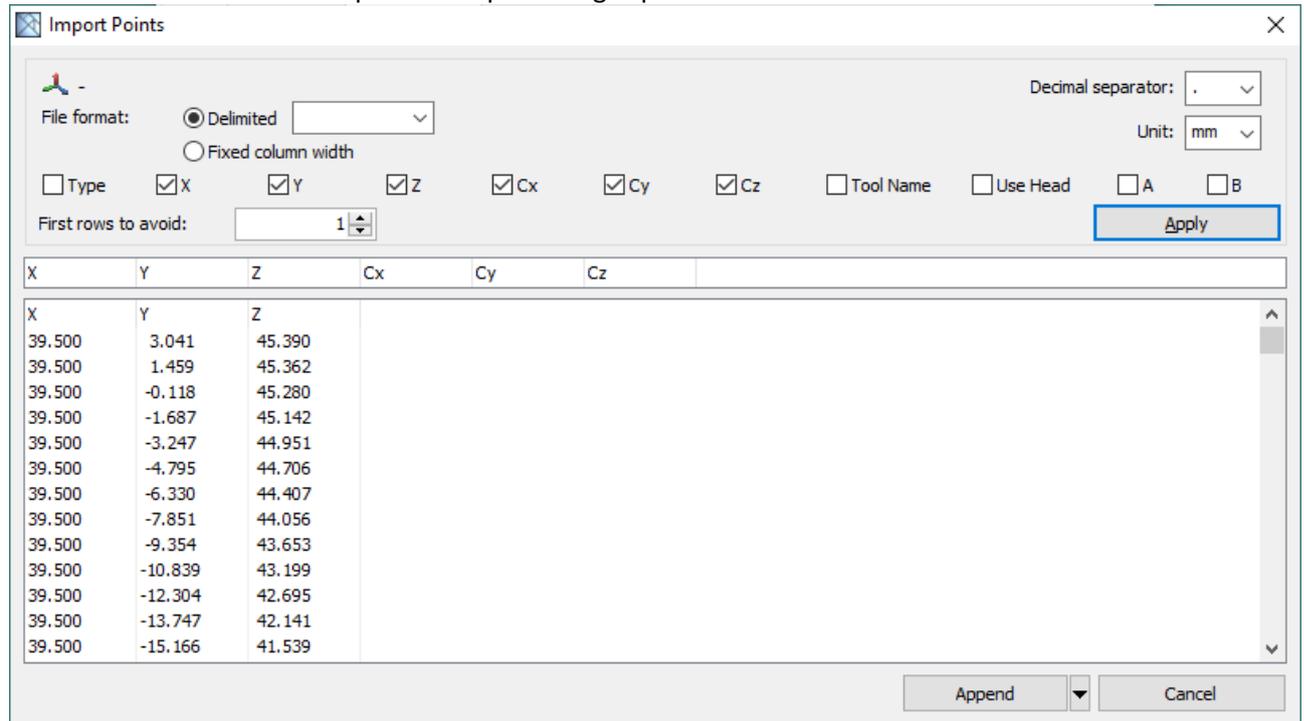
Curve4 <Curve.Inherited>						
Curve	Nominal Path	Nominal Points	Actual Points			
	X	Y	Z	Cx	Cy	Cz
1	36.5000	3.0410	45.3900	0.000000	0.000000	0.000000
2	36.5000	1.4590	45.3620	0.000000	0.000000	0.000000
3	36.5000	-0.1180	45.2800	0.000000	0.000000	0.000000

Two functions available by RMC on the grid:



- Click "Import from File" to fill the grid with nominal points to compare. A dialog will be open to choose the text file with any extension and one point coordinates per row (direction is optional).

After the usual selection of option to import brings up:



Import Points

File format:  Delimited  Fixed column width

Decimal separator: . Unit: mm

Type  X  Y  Z  Cx  Cy  Cz  Tool Name  Use Head  A  B

First rows to avoid: 1

X	Y	Z	Cx	Cy	Cz
X	Y	Z			
39.500	3.041	45.390			
39.500	1.459	45.362			
39.500	-0.118	45.280			
39.500	-1.687	45.142			
39.500	-3.247	44.951			
39.500	-4.795	44.706			
39.500	-6.330	44.407			
39.500	-7.851	44.056			
39.500	-9.354	43.653			
39.500	-10.839	43.199			
39.500	-12.304	42.695			
39.500	-13.747	42.141			
39.500	-15.166	41.539			

Append Cancel

and the resulting points will be added to the Nominal Points grid.

- Click “Delete all” to clear the grid.

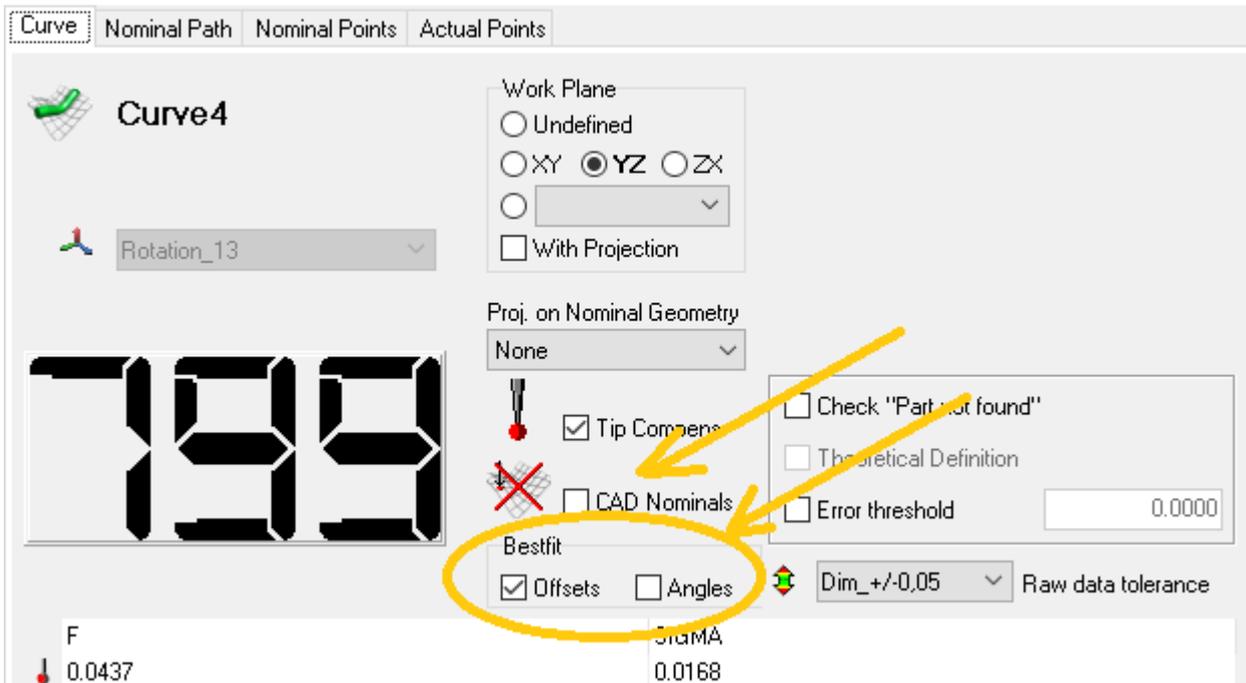
When list is assigned the Nominal point list, it is used for evaluation in the meaning that it enables a filter of the measured points to provide point-to-point comparison.

In case of active CAD, uncheck the **CAD Nominals** option to ensure that the nominal points are not coming from the projection of points to the CAD model. The CAD option is prevalent

Check the **Bestfit** options to enable the calculation using Nominal list imported and Measured points filtered.

Offset and angle corrections can be selected independently.

Curve4 <Curve.Inherited>



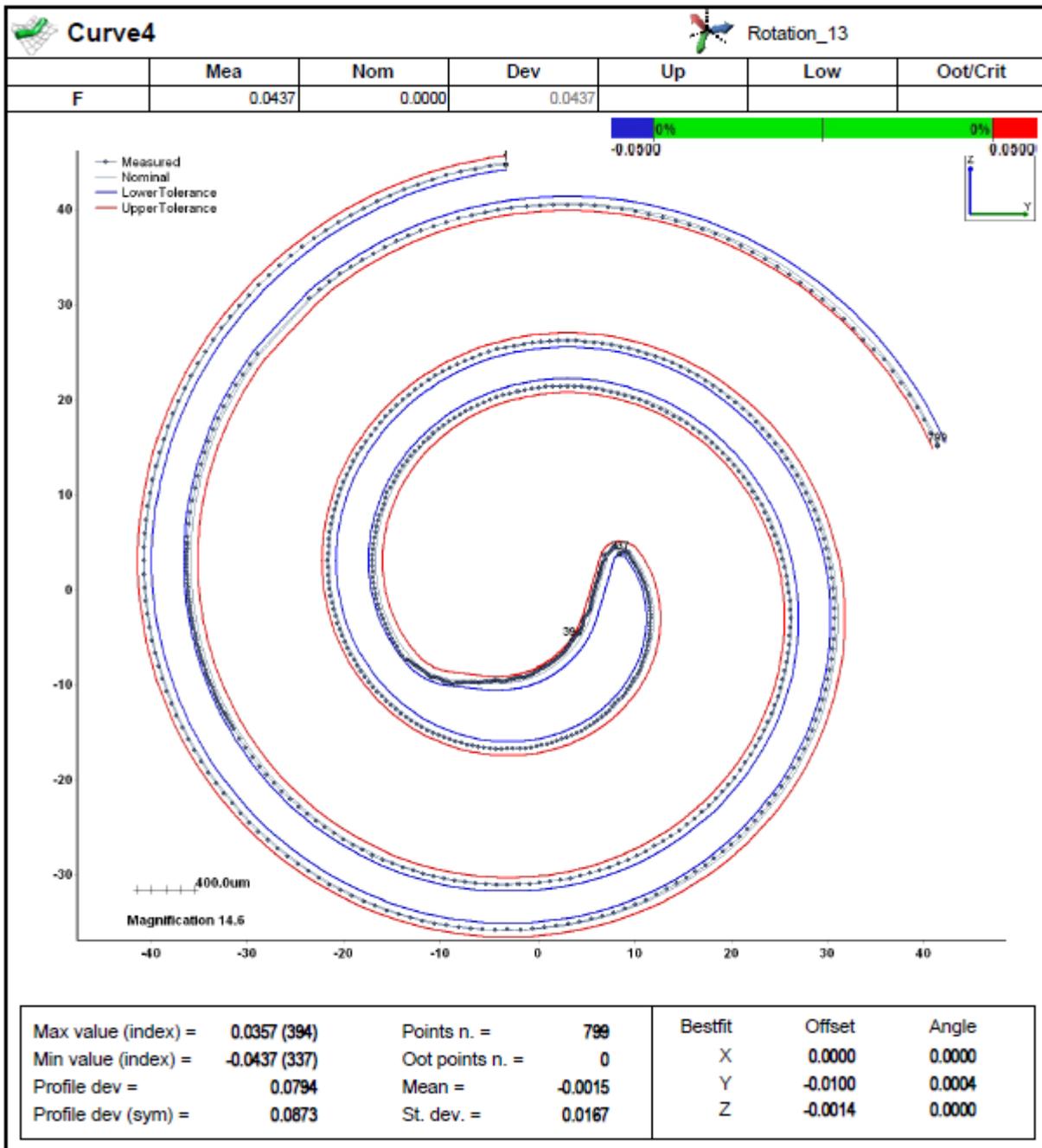
The screenshot shows the 'Curve4' configuration window. On the left, there is a graphical preview of a curve labeled 'Curve4' with a 'Rotation\_13' dropdown. The main settings area includes:

- Work Plane:** Radio buttons for Undefined, XY, YZ (selected), and ZX. A 'With Projection' checkbox is also present.
- Proj. on Nominal Geometry:** A dropdown menu set to 'None'.
- Tip Compensation:** A checked checkbox.
- CAD Nominals:** An unchecked checkbox.
- Bestfit:** A section containing checked 'Offsets' and unchecked 'Angles' checkboxes. This section is circled in yellow.
- Check 'Part not found':** An unchecked checkbox.
- Theoretical Definition:** An unchecked checkbox.
- Error threshold:** A text input field with the value '0.0000'.
- Dim\_+/-0,05:** A dropdown menu.
- Raw data tolerance:** A text input field.

At the bottom left, there is a 'F' label and a value of '0.0437'. At the bottom right, there is a 'Sigma' label and a value of '0.0168'.

## Graphical report enhancement

In case of Bestfit, the distribution of points in 2D will generate the following layout including results information of the bestfit calculation.



Magnification is by default automatically evaluated like in the picture where the tolerance band has been magnified 14.6 times.

But you can assign this scalar value in the Protocol settings:

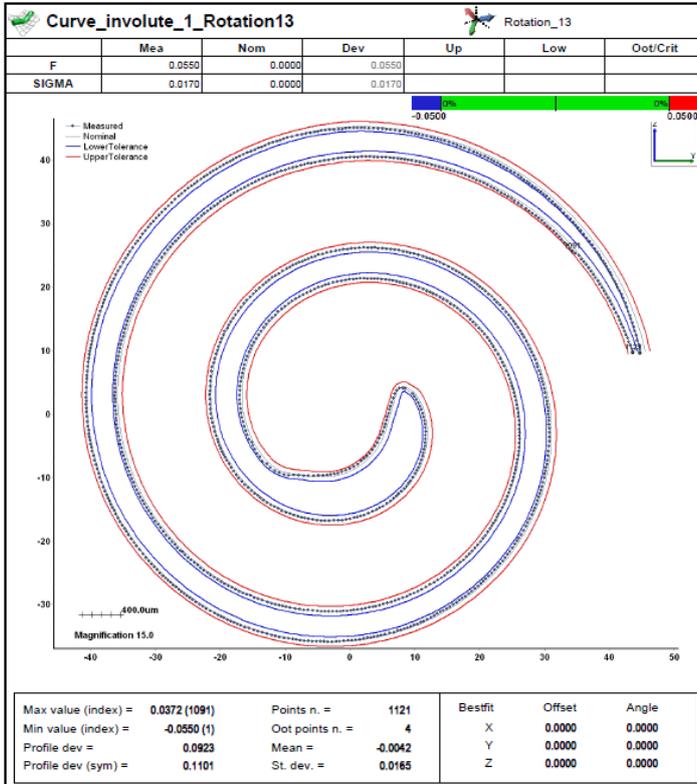
RawData

RawData Compensated

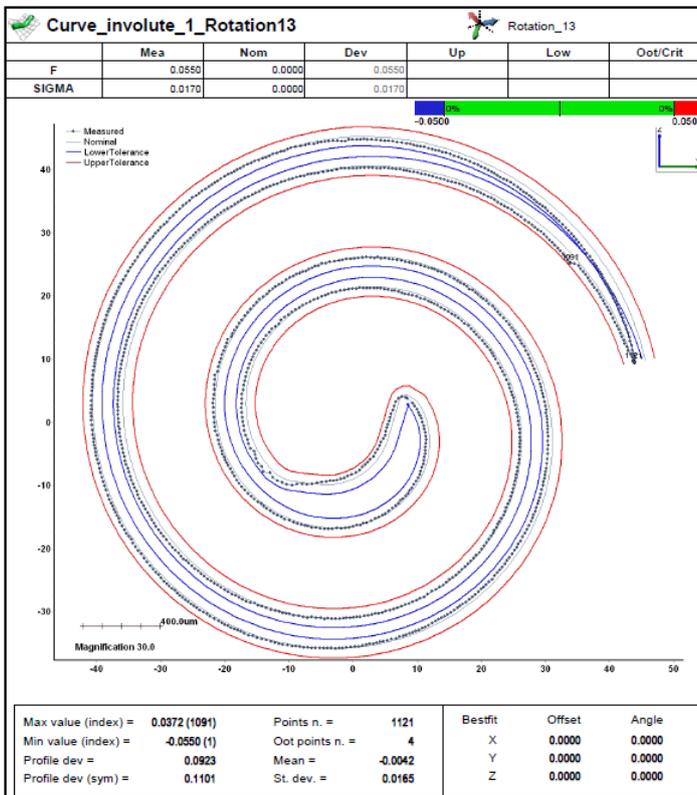
Points distribution

Force Points in HDB  Force Magnif.

Here are two samples to compare different magnifications:



Magnification=15



Magnification=30