Using Verisurf MBD

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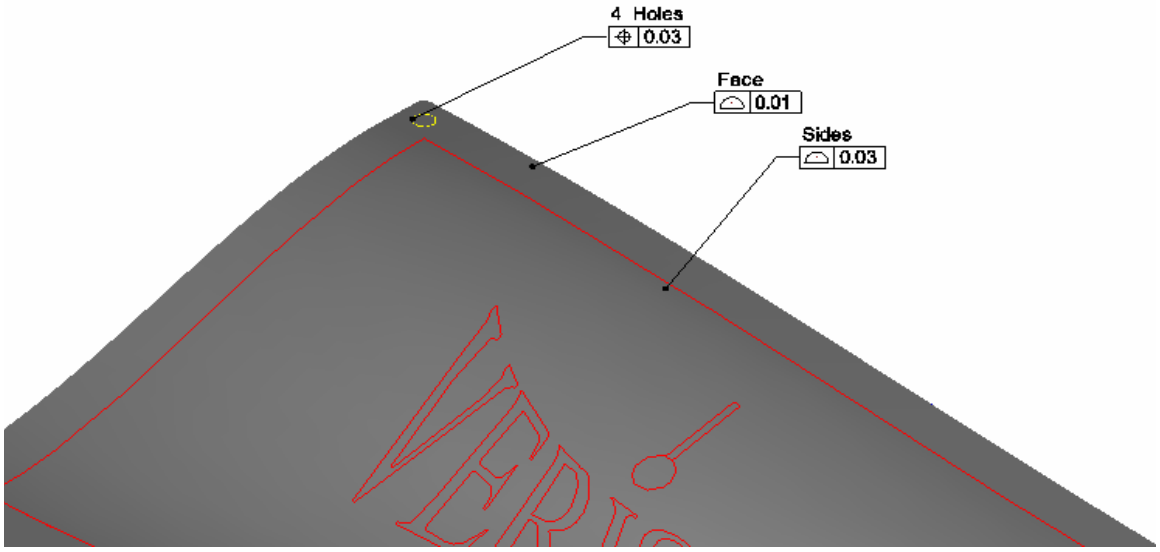
About Verisurf MBD

The Verisurf MBD or Model Based Definition is a new tool that enables an operator to place, and view feature names and geometric tolerance annotations that are associated to the model entities with real-time visual true-to-view dynamic text display.

This could be a surface profile call out associated with a surface or group of surfaces. It could be a position call out associated with a hole or group of holes. These MBD's then become part of the 3D model and will be used during Inspection, Build or Analysis.

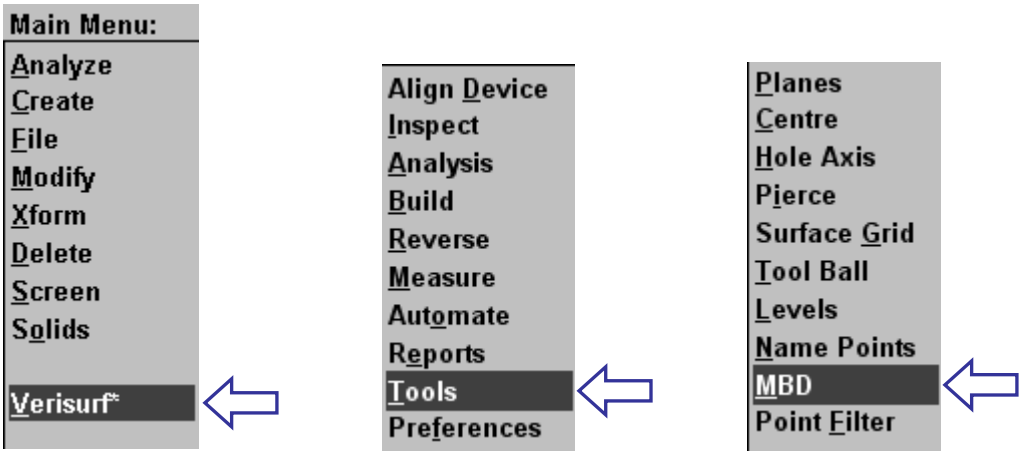
As stated they can attach to a surface or 'group' of surfaces. This grouping is done to ease the operator from having a part with 100 surfaces having 100 separate MBD's attached to the model. This would be both tedious in application and cluttered in presentation. Using the design packages groups command we can gather all entities of similar tolerances and group them together under one MBD.

While running Inspect, Build or Analysis, Verisurf will then seek out the MBD tolerance and use the entity or group name in the report or display. This can aid in identifying where points were taken or where your measuring device is located.



An example of 3 MBD tolerances.

Accessing Verisurf MBD



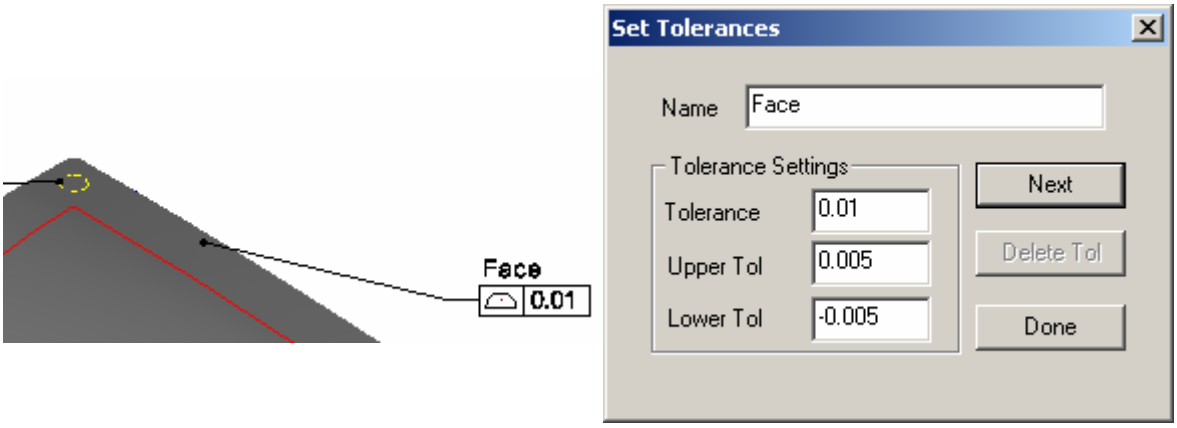
From the main menu click **Verisurf** then click **Tools** and then click **MBD**

MBD Menu

When this menu is up you can start picking surfaces with the left mouse button and dynamically pull out a name and tolerance annotation, place the label by re-clicking on the left mouse button at a desirable position. You can change its position by re-selecting the label or its surface.

Select

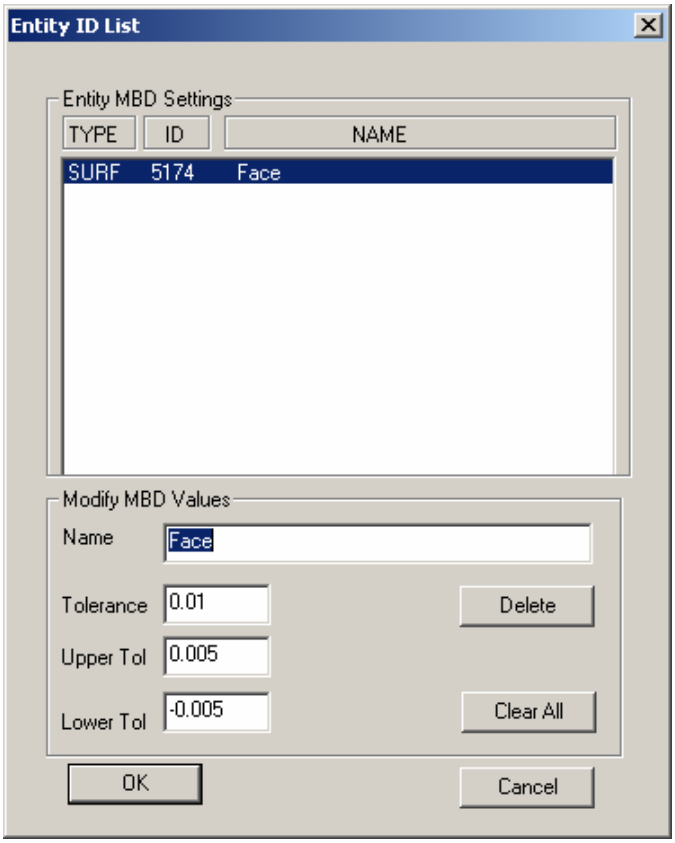
Use this menu selection to choose entities to apply MBD tolerances to. In this example we have chosen the face of the Demo part. The name has been changed to Face and the MDB Profile of a surface of .010 or +/-.005 is now there.



After applying this tolerance, note that if the placement is not optimal you can continue to choose other areas of the face and the name and tolerance follows along until you find the proper place for your MBD annotation. In the next example I have decided on the upper left corner.

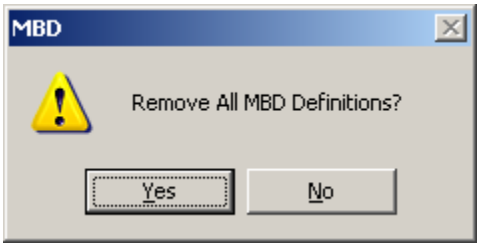
Edit

The edit screen can be used to change any MBD you may have created. This is the edit screen. At this screen you can change the Name or Tolerance of any MDB in your model. If it is a group being edited the name can only be changed at the design groups menu.



Clear All

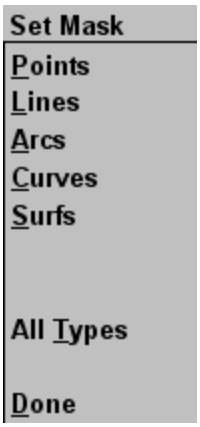
This command is exactly what it implies.



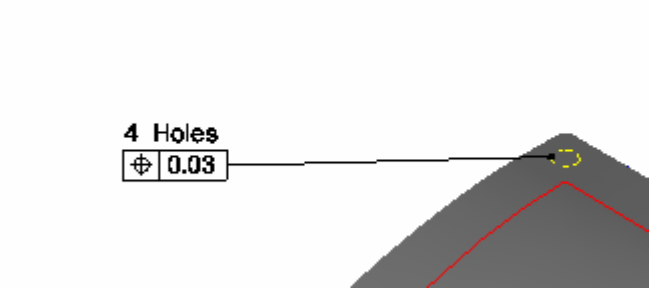
This WILL remove ALL MBD definitions.

Set Mask

This command is used in conjunction with the selection of entities that you wish to apply MBD to. Choosing Set Mask will bring up a Set Mask selection screen.

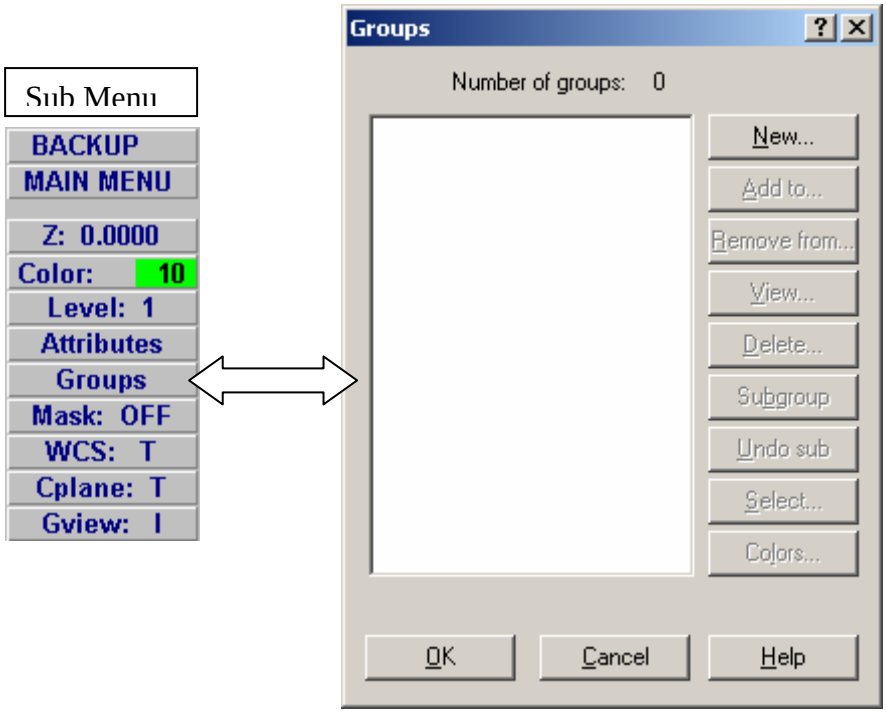


On the current example Set Mask was used to gather the 4 holes that are defined by arcs. After choosing Arcs choose Done and select the arc. In this example choosing one of the arcs gathers all 4 arcs that have a group name of 4 holes.



Grouping of Entities

Grouping menu

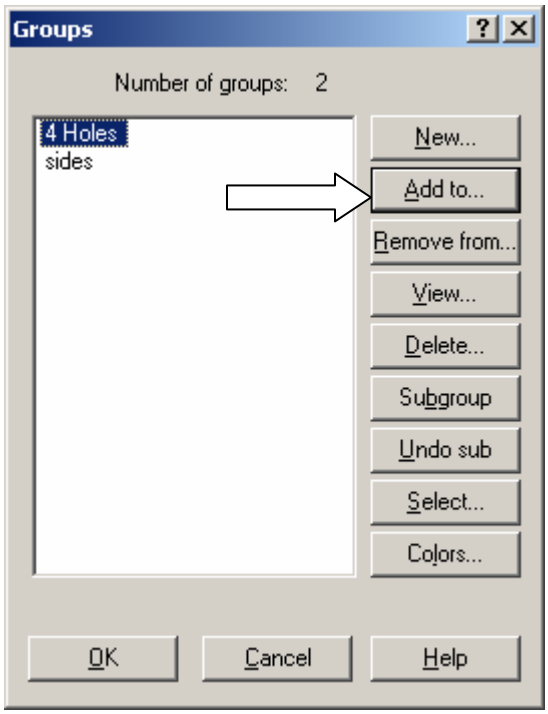


New

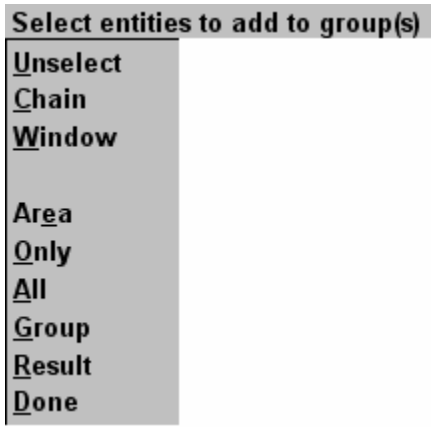
. In this example we will name the group sides. You will then be shown the entity selection menu. You can use the choices there to gather the entities but in this example I rotated the model to gather all the side surfaces.

Add to

Choosing Add to… will enable you to add to the group with additional entities.



After choosing Add to… the Select entities to add to group(s) menu will be shown.

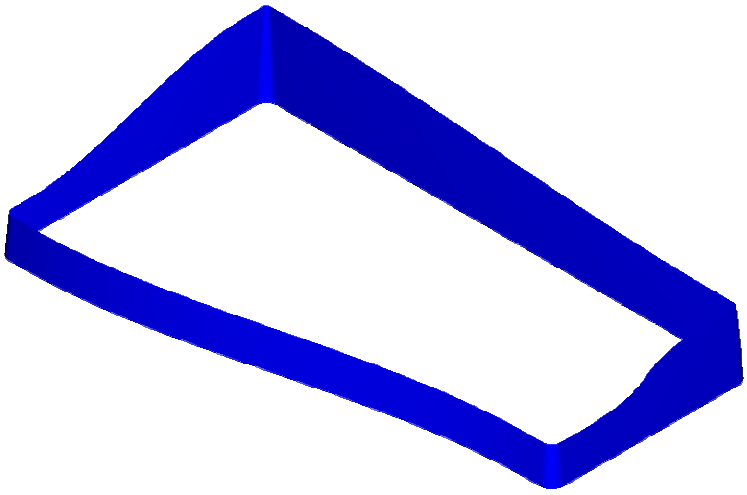


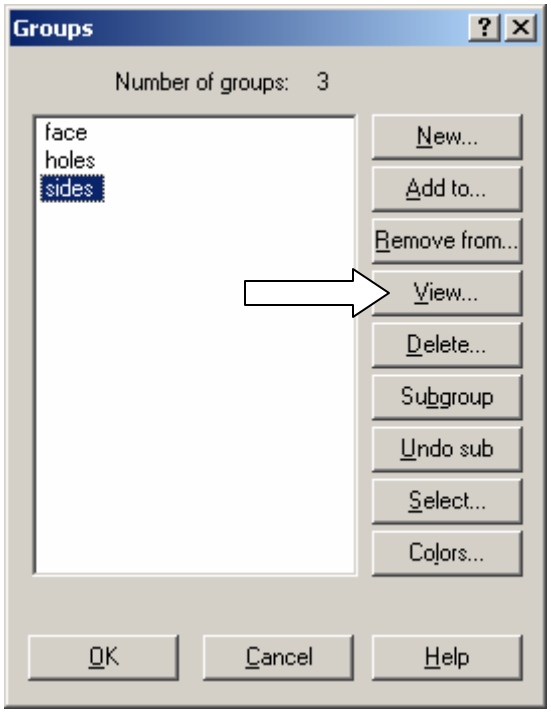
Remove from

Choosing remove from… will do the opposite of Add to… It will bring up a similar menu, Select entities to be removed from group(s).

View

Using View under Groups can be especially helpful to verify the correct entities have been chosen during grouping. Choosing to view sides yields the following graphics view.





Delete

Delete will remove a group from the group list. You will be prompted to verify the deletion.

Subgroup

Subgroups can be used to gather various groups into a group of their own. It will take on the organization of a feature tree. Subgroups provide an additional layer of data management.

Undo sub

Undo sub is used to remove a subgroup from it's parent.

1. Choose Groups from the Secondary Menu. The Groups dialog box opens.
2. Click on the name of the subgroup to be removed.
3. Choose Undo Sub. Mastercam removes the indent and changes the subgroup into a parent group.

Select

Use this method of highlighting a group when you know which entities belong to the group but not the group's name.

1. Choose Groups from the Secondary Menu. The Groups dialog box opens.
2. Choose Select.
3. Select an entity in the graphics window that belongs to the group you want and choose Done. The Groups dialog box reopens with the group name highlighted.

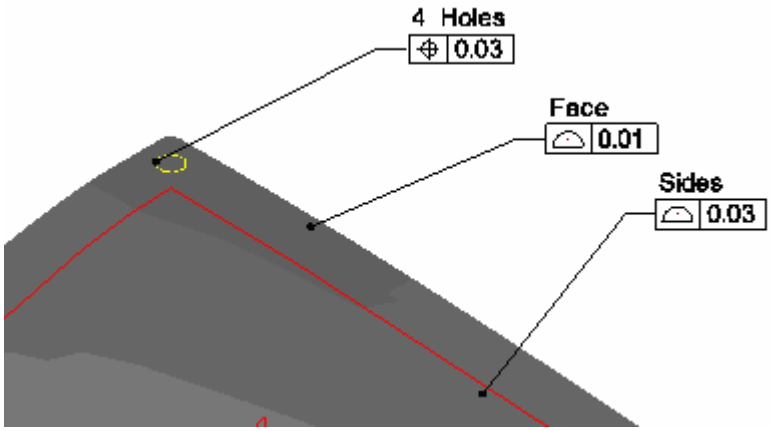
Colors

Grouped entities can be identified with a color without having to reassign the native color of each entity within the group.

1. Choose Groups from the Secondary Menu. The Groups dialog box opens.
2. Select the name of the group that you want to assign a color.
3. Choose Colors. The Group Color dialog box opens.
4. Select Use Group's Color.
5. Choose the color button to open the Color dialog box, choose a color, and then choose OK. Or, enter the color's number and choose OK. The color patch changes to reflect your choice.
6. Choose OK to exit the Group Color dialog box.
7. Choose OK to exit the Groups dialog box. The entities display with the group color.

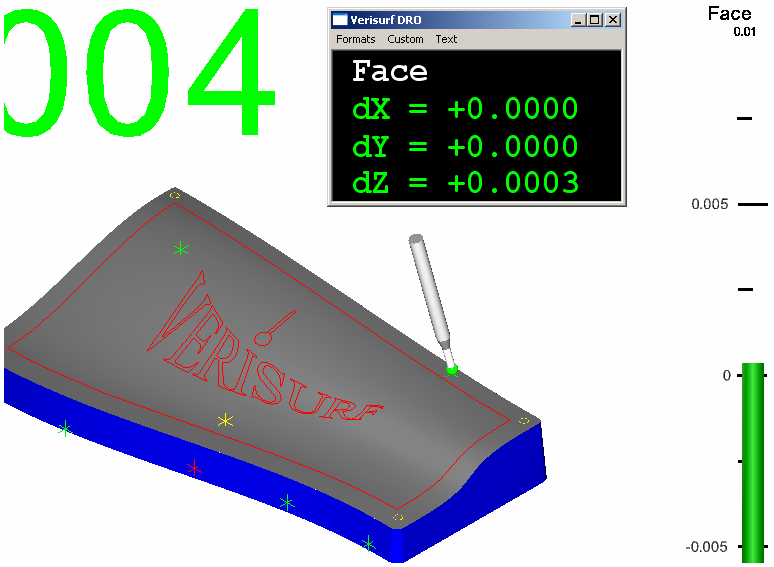
Selecting groups for MBD tolerances

After grouping an array of entities to tolerance you can now select anywhere on the group and the entire group will have that tolerance. You may also notice that re-selecting anywhere on the same group only moves the location of the tolerance. The tolerance will also carry the name of the group. Notice how these MBD's have been moved to frame them in the picture.

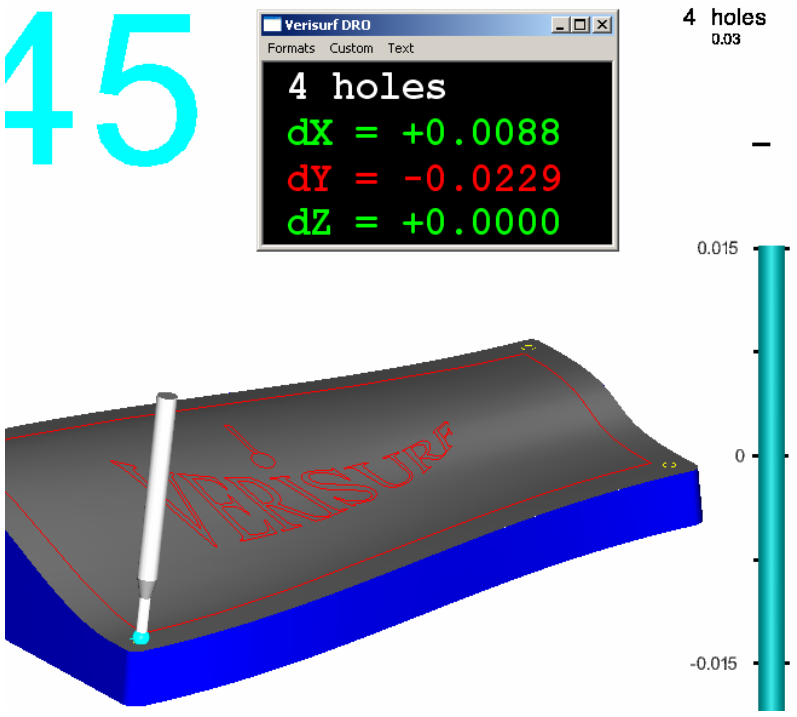


Using MBD in Build

When there is MBD present in the model the Build module will use the MBD. As the measuring device approaches an entity with MBD the screen items will change to reflect that entity. In the following picture notice the DRO and the bar chart have headings of **Face** and the bar tolerance has changed to +/-.005.



In the next picture the measuring device is in one of the group of **4 holes**. The DRO and theBar chart have changed to reflect the change and the bar chart tolerance is now +/-.015.



Using MBD in Analysis

In the analysis module you can turn ID's on and the names will be that of the MDB tolerance for any surface profile points. In the following screenshot you will note that the balloons contain ID's for both Face and Sides.

When Analysis reports the surface points the report can be sorted using the MBD. Note in the following report that there are 2 Side points and then 3 Face points.

Verisurf Inspection Report

Sides - Point 1	**X**	**Y**	**Z**	**Profile**
Actual	1.6058	0.0849	0.4406	GOOD
Nominal	1.6057	0.0859	0.4405	+/- 0.0150
Deviation	0.0001	-0.0010	0.0001	0.0010
Sides - Point 2	**X**	**Y**	**Z**	**Profile**
Actual	9.8922	1.6195	0.6453	GOOD
Nominal	9.8921	1.6208	0.6452	+/- 0.0150
Deviation	0.0000	-0.0013	0.0001	0.0013
Face - Point 1	**X**	**Y**	**Z**	**Profile**
Actual	1.3659	2.8521	1.3290	GOOD
Nominal	1.3660	2.8508	1.3322	+/- 0.0050
Deviation	-0.0001	0.0012	-0.0032	-0.0034
Face - Point 2	**X**	**Y**	**Z**	**Profile**
Actual	5.8884	4.9401	1.6289	GOOD
Nominal	5.8886	4.9398	1.6311	+/- 0.0050
Deviation	-0.0002	0.0002	-0.0022	-0.0023
Face - Point 3	**X**	**Y**	**Z**	**Profile**
Actual	9.1721	2.7748	0.8225	GOOD
Nominal	9.1721	2.7745	0.8257	+/- 0.0050
Deviation	-0.0000	0.0003	-0.0032	-0.0032