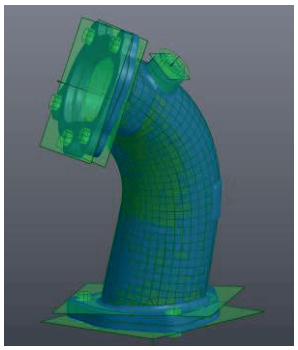
1 INTRODUCTION

This tutorial is intended for users who need to become familiar with VXmodel. It will guide you through a Scan-to-CAD workflow by cleaning and aligning the mesh, then extracting required entities in order to transfer to CAD software.

Scan Data



Scan data aligned with entities for CAD software

1.1 DATA FILE

For **Scan-to-CAD Tutorial 1.csf** follow: **Installation Path>\VXelements\Demo\VXmodel**

The sample data for this tutorial is provided by Creaform. They are the property of Creaform and are used for informational purposes only.

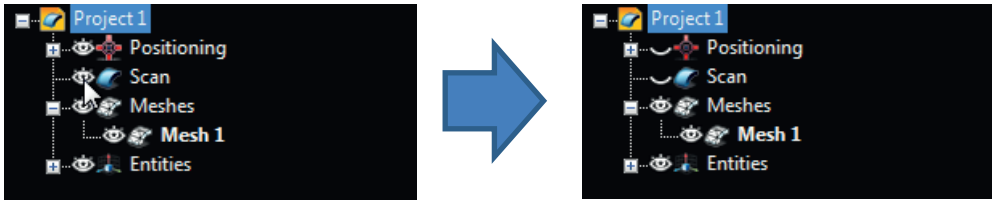
Normally, after completing the scan, the Scan needs to be transferred to the **Meshes** branch by clicking on the **Create Mesh** 

button to access VXmodel functionalities.

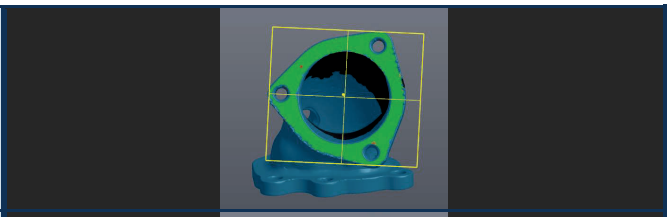
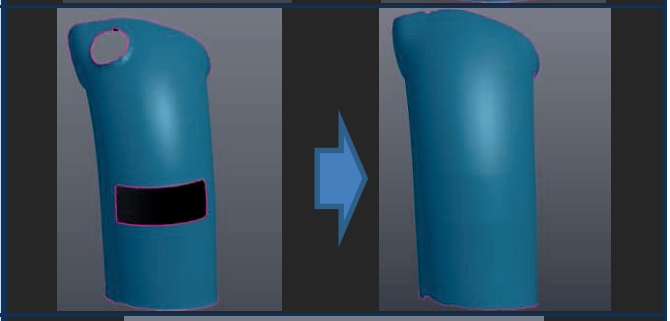
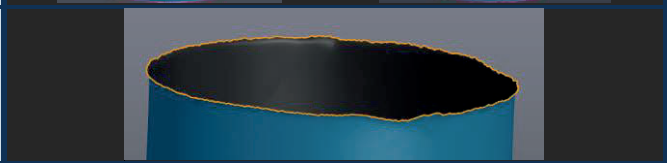
For this Tutorial, the scan data has been already transferred to the Mesh branch of VXmodel.

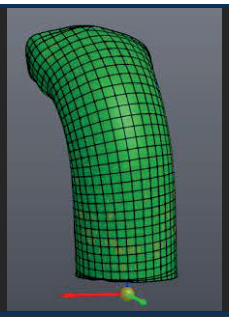
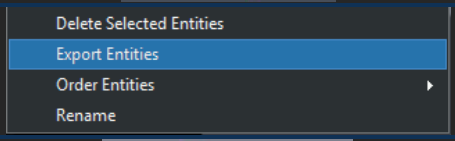
As good practice, hide the **Scan** and **Positioning Targets** branch to avoid confusion in display.

To do so, **click** on the “eye” icon to hide or show. →



1.2 WHAT WILL THIS TUTORIAL COVER?

Step 1. Extract entities for alignment	
Step 2. Align the mesh to origin	
Step 3. Create entities for reverse engineering	
Step 4. Duplicate the middle section of the pipe and create a new mesh	
Step 5. Clean the mesh & fill holes	
Step 6. Fit boundary to curve and cut mesh	

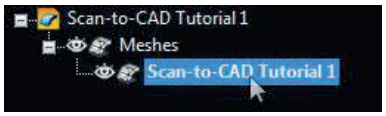
Step 7. Complete the inner surface and create the Auto-Surface	
Step 8. Export files for CAD software	
Step 9. Inspect the reverse engineered part	

2 MODELING PROCESS

2.1 Step 1 EXTRACT ENTITIES FOR ALIGNMENT

Creating geometric entities based on the mesh will be used for alignment. It is important to choose the most important and relevant entities for the alignment. The first step of the tutorial is critical for the step 9. If an error occurs, the compare will not be successful.

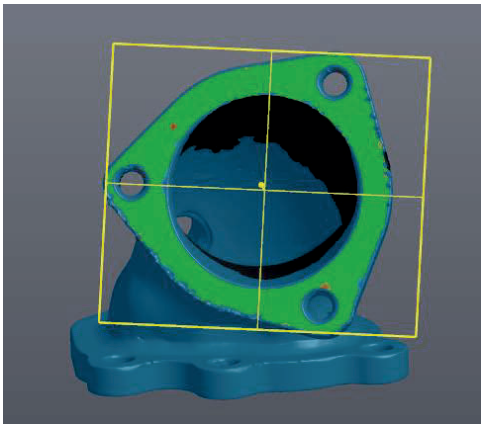
- **Click** on the mesh **Scan-To-CAD Tutorial 1** to see VXmodel functionalities.



2.1.1 Add a New Plane

- **Click** on the **Add a New Plane** button.
- Set the **Building Mode** to **Triangles Selection**.

- Select the **Similar Normal** button.
- To swap to selection mode, **hold** the **CTRL** key and **left click** to select the planar surface on the flange.

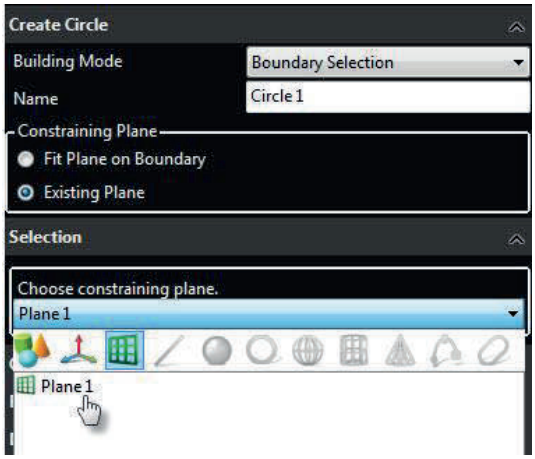


Note: *The new plane is displayed with a deviation colormap of the surface selected to the best fitted plane. The tolerance of the colormap can be edited in the* ***Error Distribution*** *parameter.*

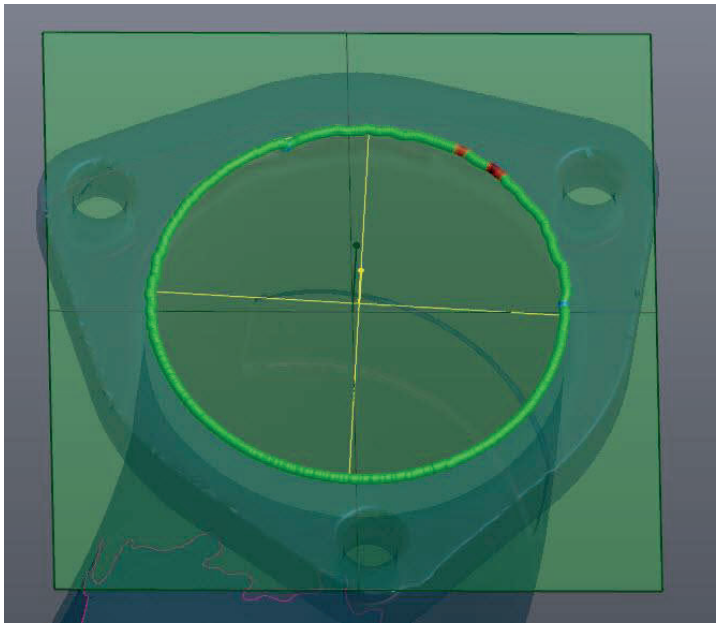
- Click on **Create** to finalize and then **Close**.

2.1.2 Add New Circles

- **Click** on the **Add a New Circle**  button.
- Set the **Building Mode** to **Boundary Selection**.
- Choose the **Existing Plane** as the **Constraining Plane** and select the **plane 1** in the drop down menu.

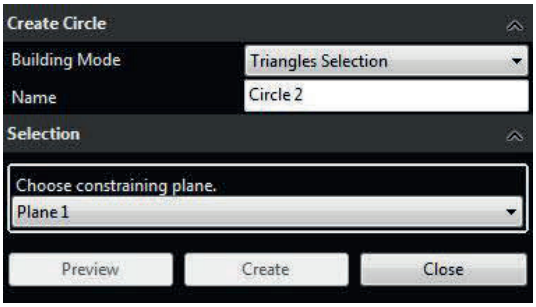


- Select the boundary.



- Click on **Create** to finalize.

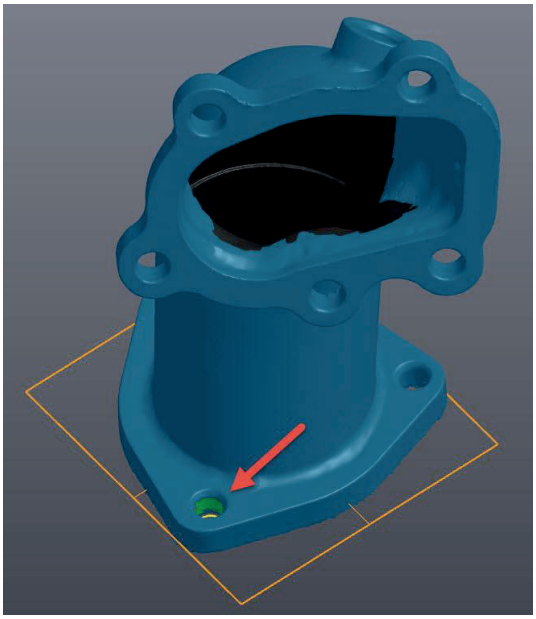
Set the **Building Mode** to **Triangles Selection** and choose **Plane 1** for the **constraining plane**.



Select the **Similar Curvature**  button.

Change the **Selection Tolerance** to **25.**

Hold the **CTRL** key and **left click** to select surface of the following cylinder inside the bottom flange.



Click **Create** to finalize then **Close**.