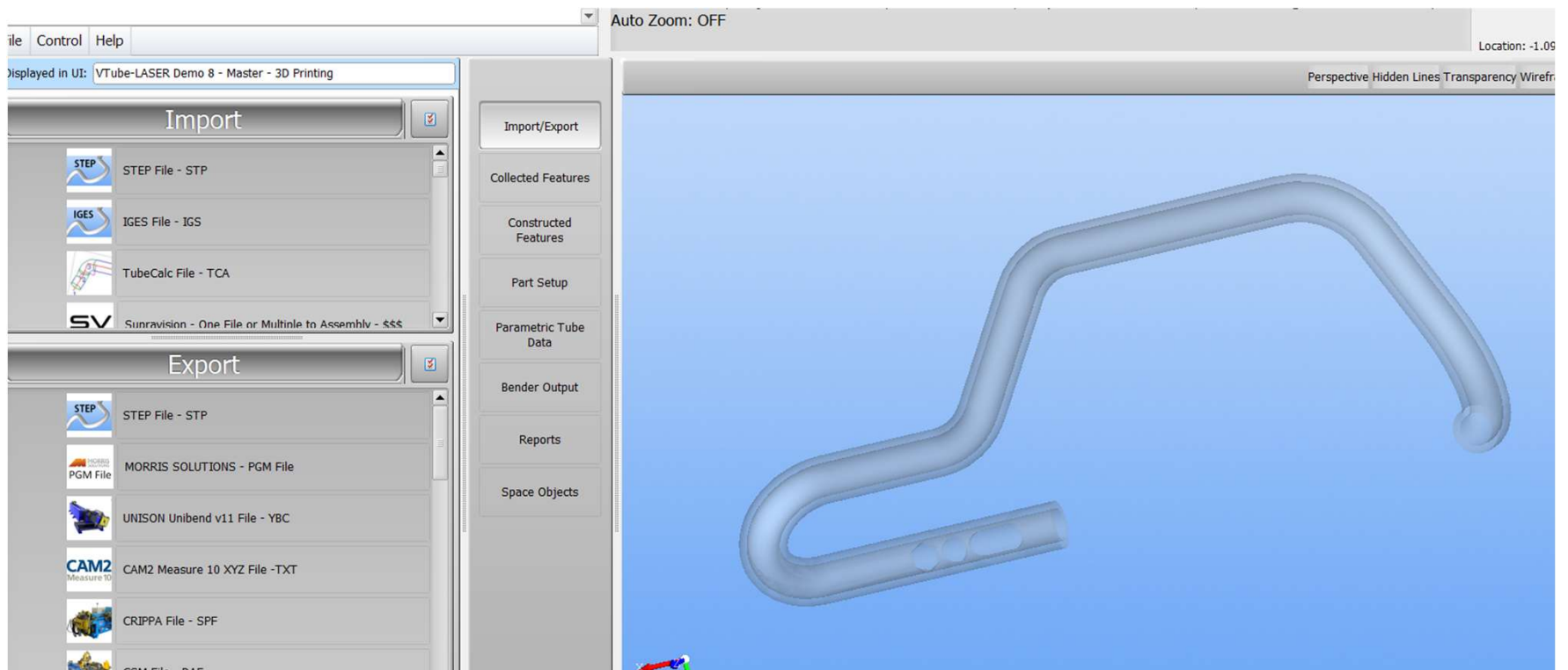




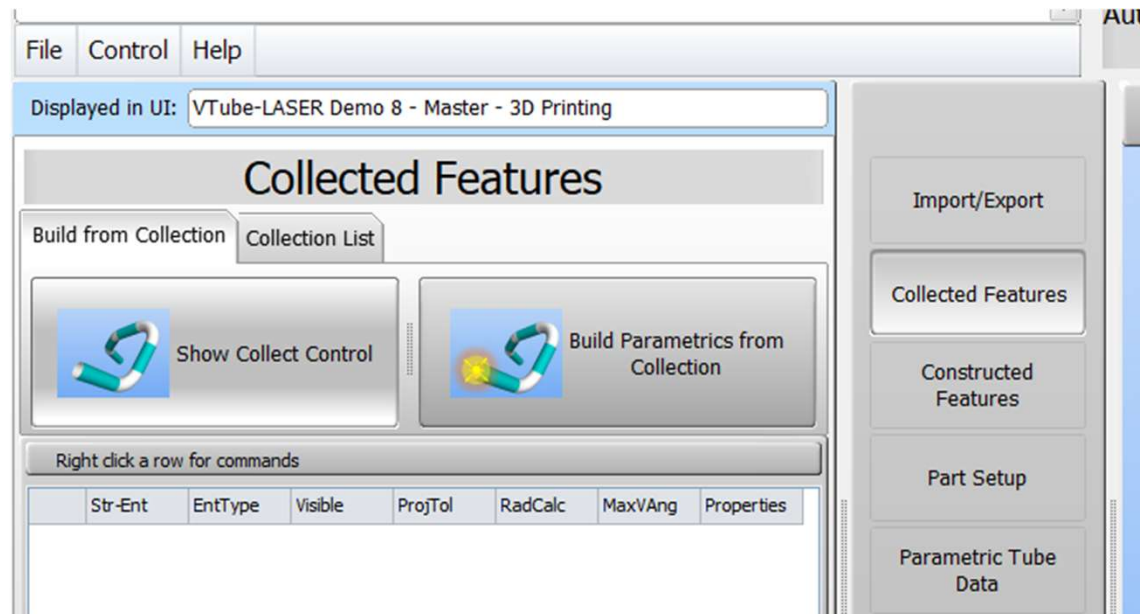
Workflow for VTube-LASER

Importing and Measuring a
Round Slot

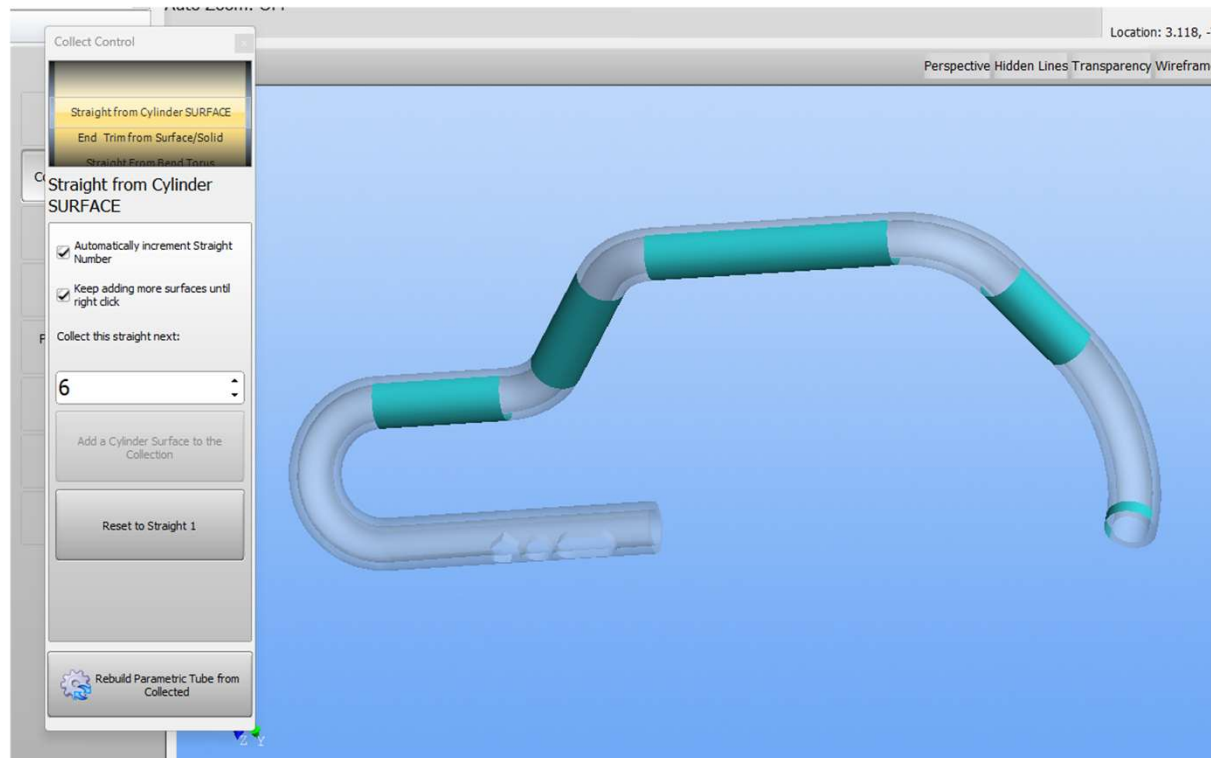
Import your 3D model



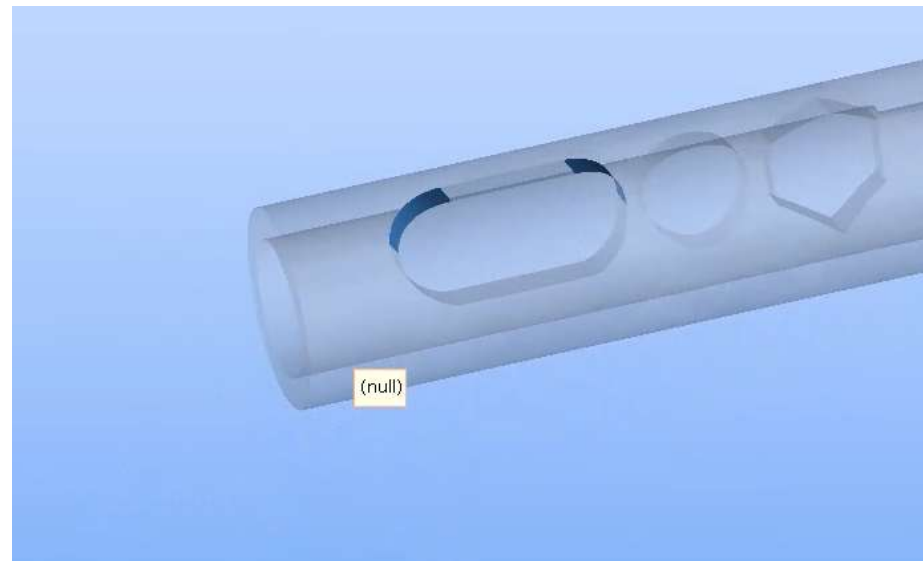
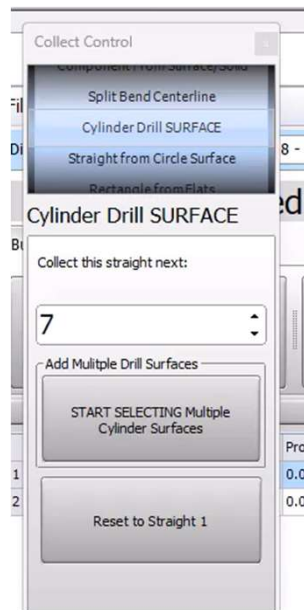
Go to Collected Features > Show Collect Control



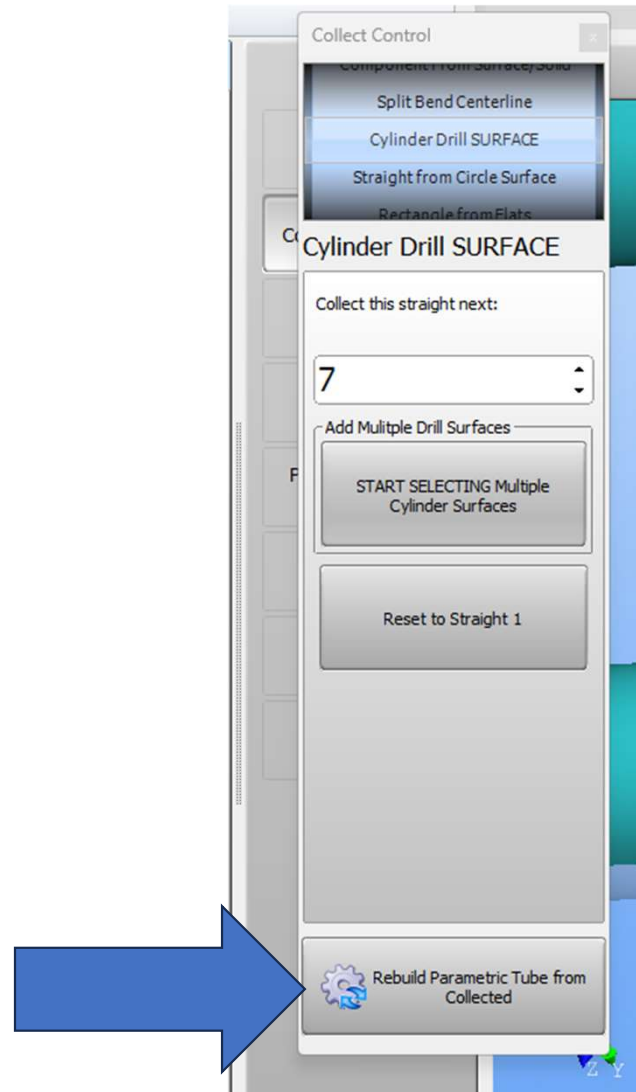
Collect your tube cylinders



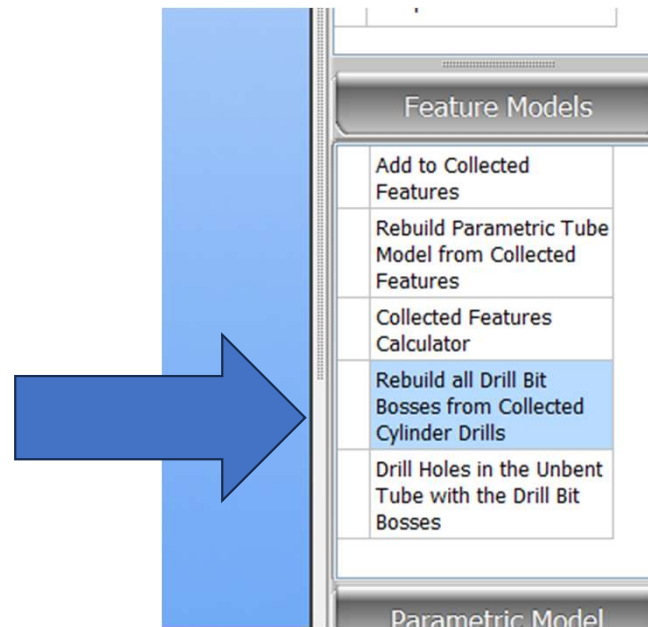
- a) Scroll down to “Cylinder Drill SURFACE”
- b) Set the straight the hole is on
- c) Select one side of the slot (half is enough)
- d) Hold SHIFT down and select the other side of the slot
- e) Right-click to [accept the selection](#)



Rebuild Parametric Tube from Collected



Rebuild all Drill Bit Bosses from Collected Cylinder Drills



You now have two Constructed Features

Displayed in UI: VTube-LASER Demo 8 - Master - 3D Printing

Constructed Features

Right click a row for commands

	Straight	EntType	Visible	Properties
1	7-1	DrillBitBoss	<input checked="" type="checkbox"/>	Diam:0.395, Ext1:0.099, Ext2:0.099
2	7-2	DrillBitBoss	<input checked="" type="checkbox"/>	Diam:0.395, Ext1:0.099, Ext2:0.099

Import/Export

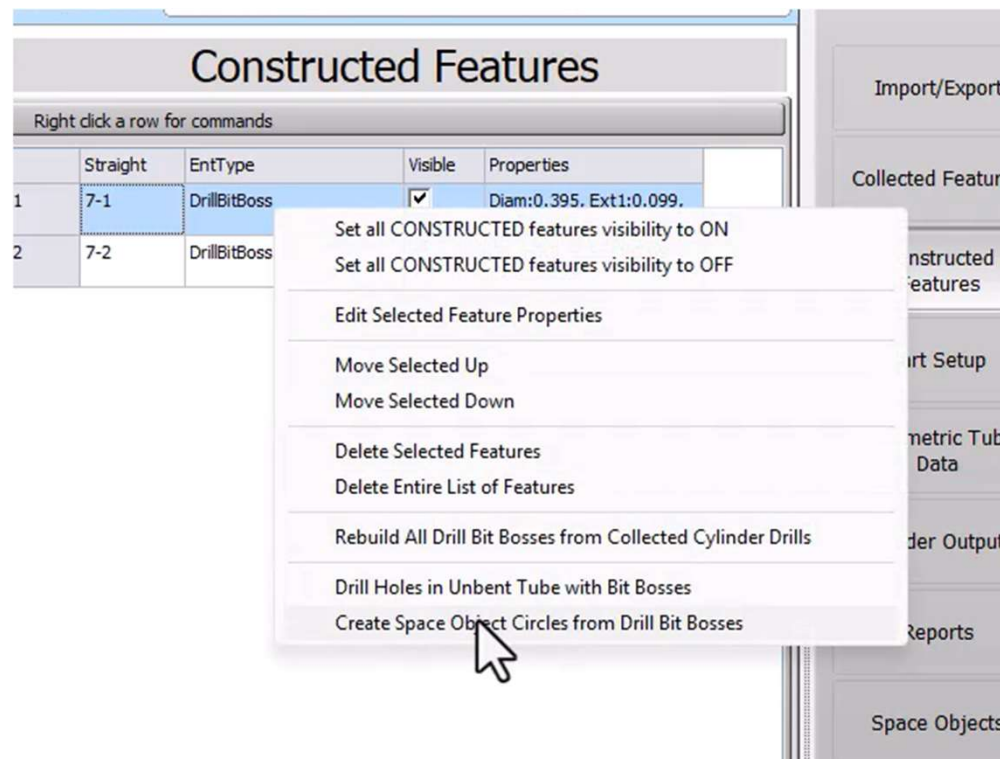
Collected Features

Constructed Features

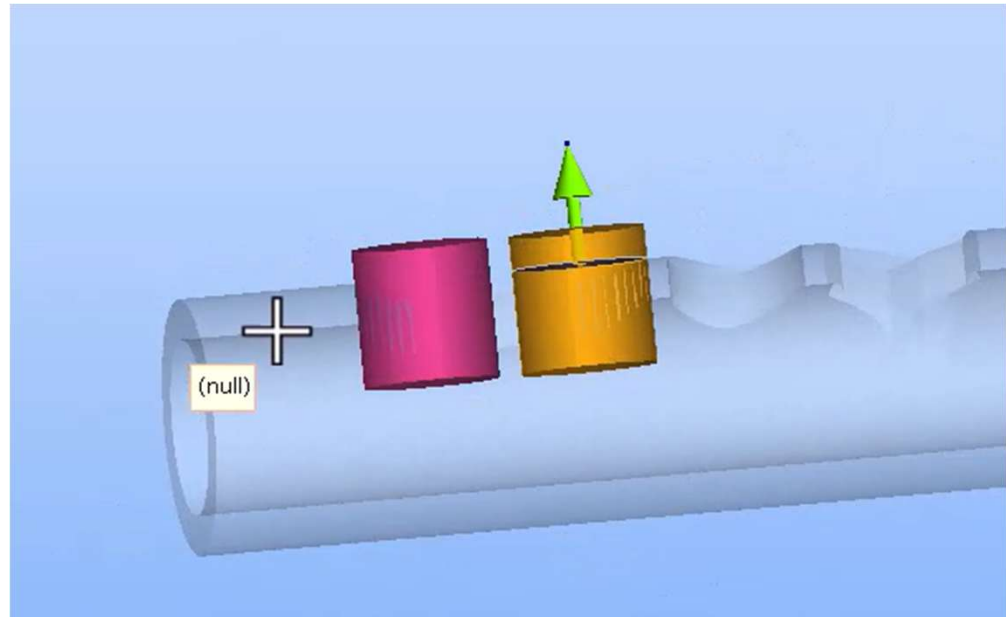
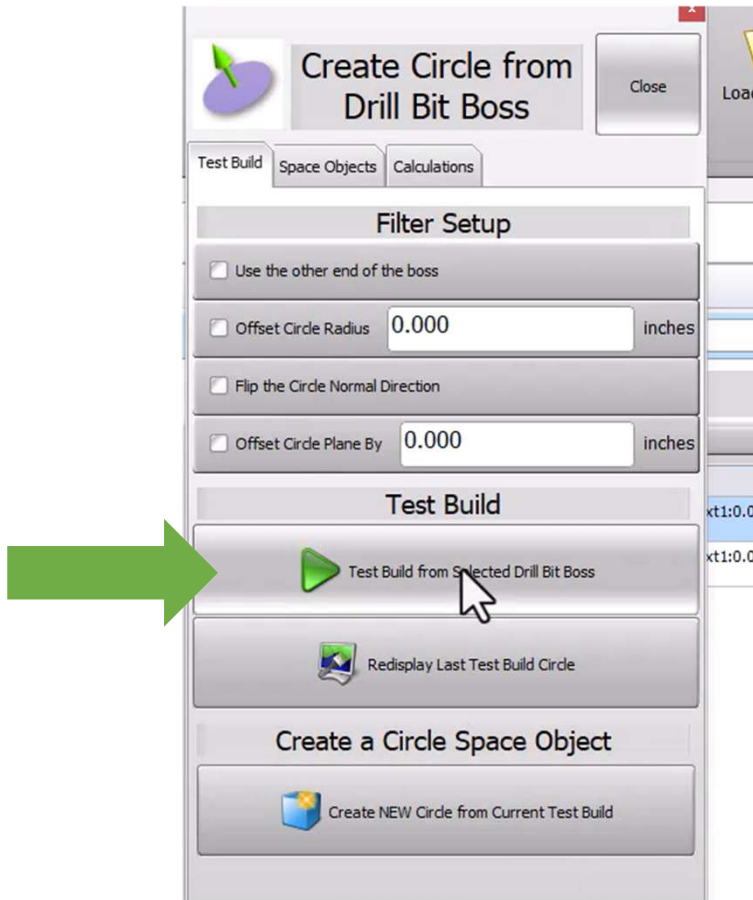
Part Setup

Parametric Tube

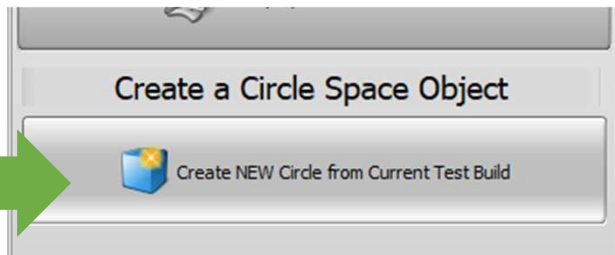
Right-click on the 'drill' of choice and select
"Create Space Object Circles from Drill Bit Bosses"



Perform a TEST to ensure the normal direction is correct.



Once the test looks good, Create NEW Circle from Current Test Build



VTube-STEP SPACE OBJECTS

Display On/Off Report On/Off Delete New List Order Global Display

All Nominal ON All Measured ON

All Nominal OFF All Measured OFF

Row Currently Selected: 1

All Space Objects On and Redraw F3 - Zoom All

Type	Name	vNom	cNom	vMeas	cMeas	Report
Circle	Circle 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

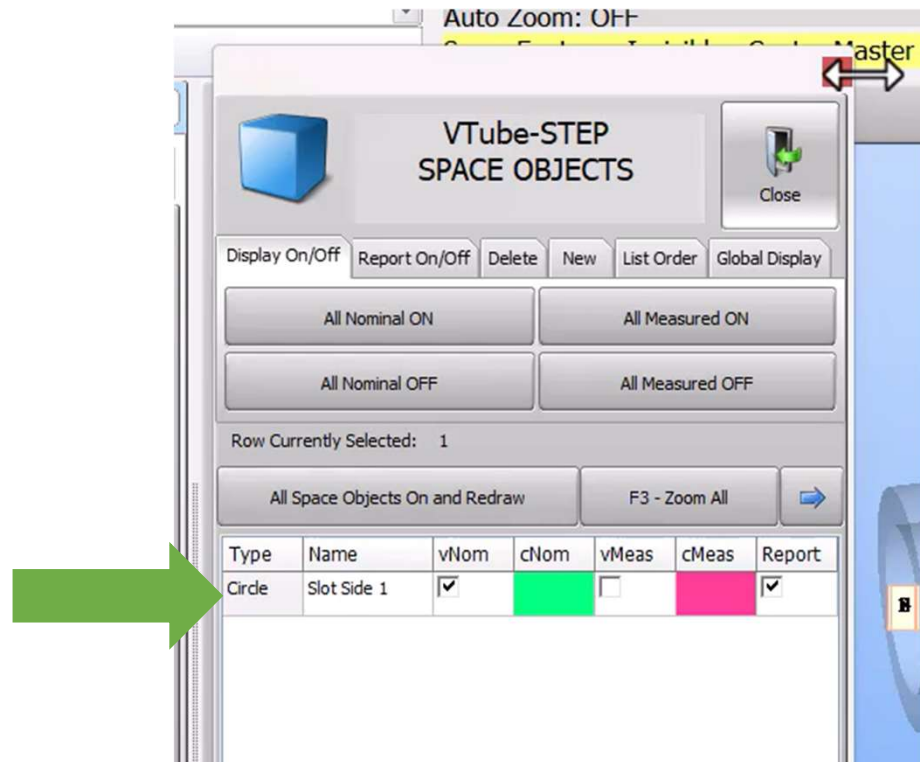
Circle "Circle 1"

General Metrics Tube Straight Metrics

Name	Nominal	Measure	Report	Qualify	Deviation	Toleran	OOT
Center X	1.654	1.654	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Center Y	-0.001	-0.001	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Center Z	0.374	0.374	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Center True Position	0.000	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Vector I	0.00043 905	0.00043 905	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Vector J	-0.00242 801	-0.00242 801	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Vector K	0.99999 696	0.99999 696	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Diameter	0.394	0.394	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Radius	0.197	0.197	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
High Side Deviation	0.000	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Low Side Deviation	0.000	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Flatness (Total Deviation)	0.000	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Flatness Standard Deviation	0.000	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000

Make this window transparent

Rename for clarity going forward

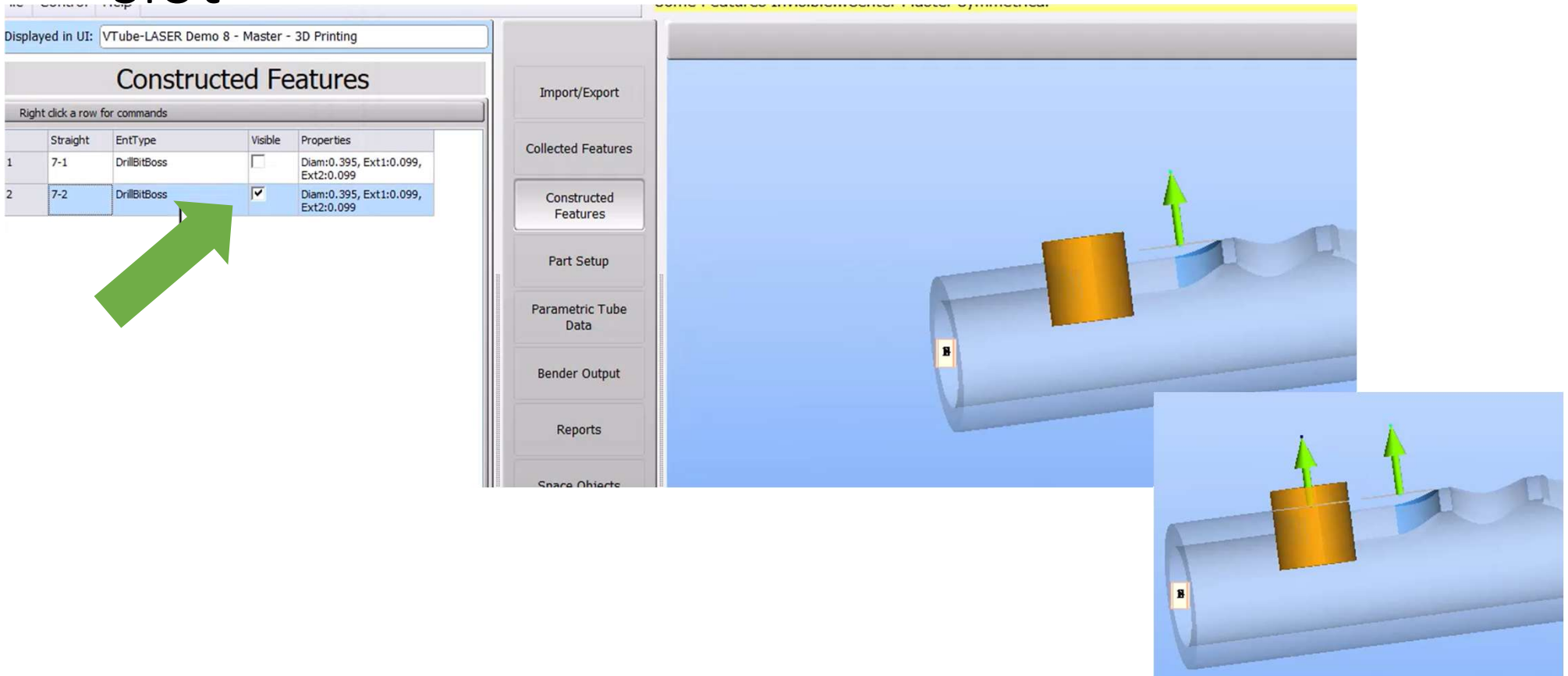


The screenshot shows a software dialog box titled "VTube-STEP SPACE OBJECTS". At the top, there is a blue cube icon and a "Close" button. Below the title bar, there are several tabs: "Display On/Off", "Report On/Off", "Delete", "New", "List Order", and "Global Display". Under these tabs are four buttons: "All Nominal ON", "All Measured ON", "All Nominal OFF", and "All Measured OFF". Below these buttons, it says "Row Currently Selected: 1". There are two more buttons: "All Space Objects On and Redraw" and "F3 - Zoom All" with a right-pointing arrow. At the bottom is a table with the following data:

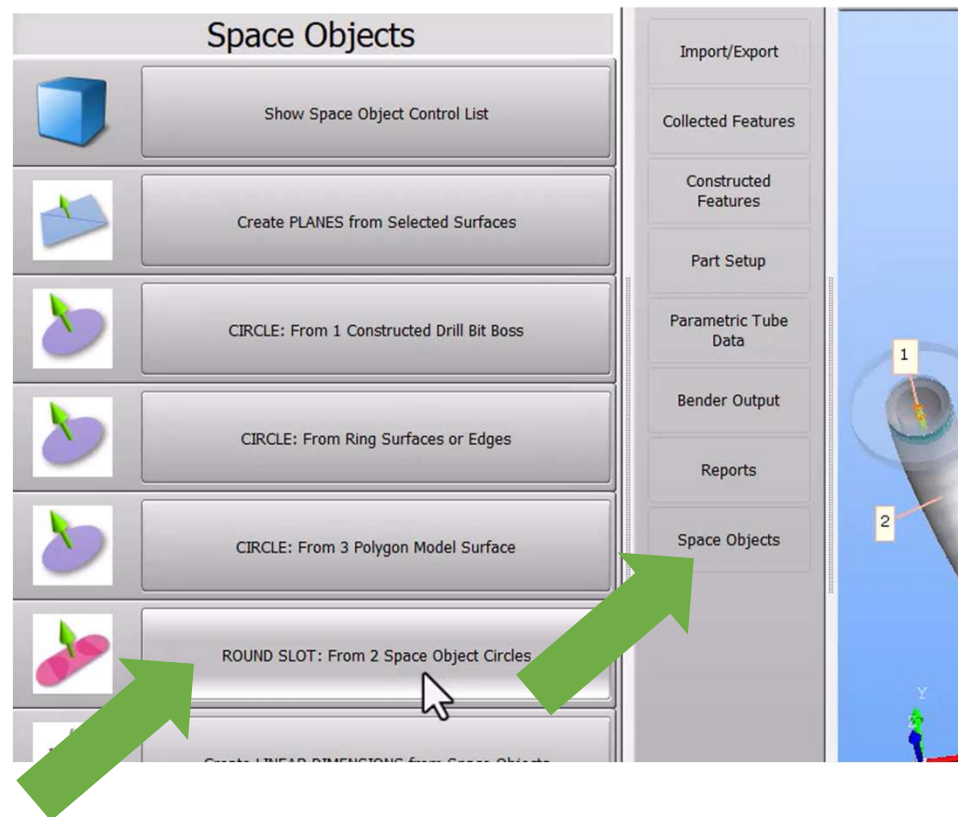
Type	Name	vNom	cNom	vMeas	cMeas	Report
Circle	Slot Side 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

A green arrow points to the "Name" column of the table.

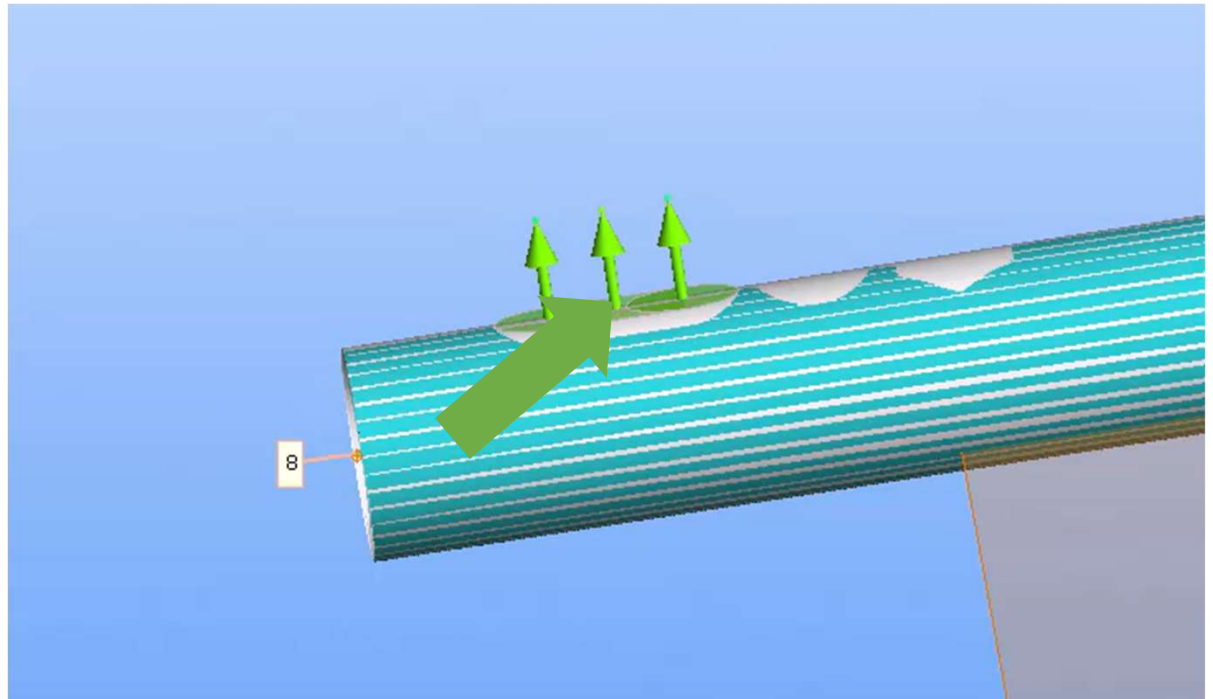
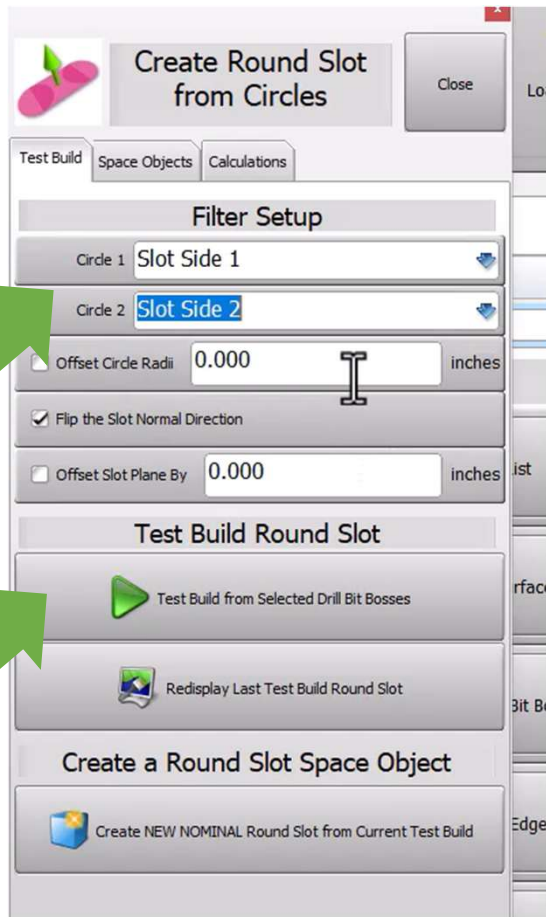
Repeat this process for the other side of the slot



Once both sides of the slots have been collected, go to Space Objects > ROUND SLOT



Select both sides of the slot under Filter Setup and create a TEST. This will put another arrow in the center of the slot.



Create a Space Object

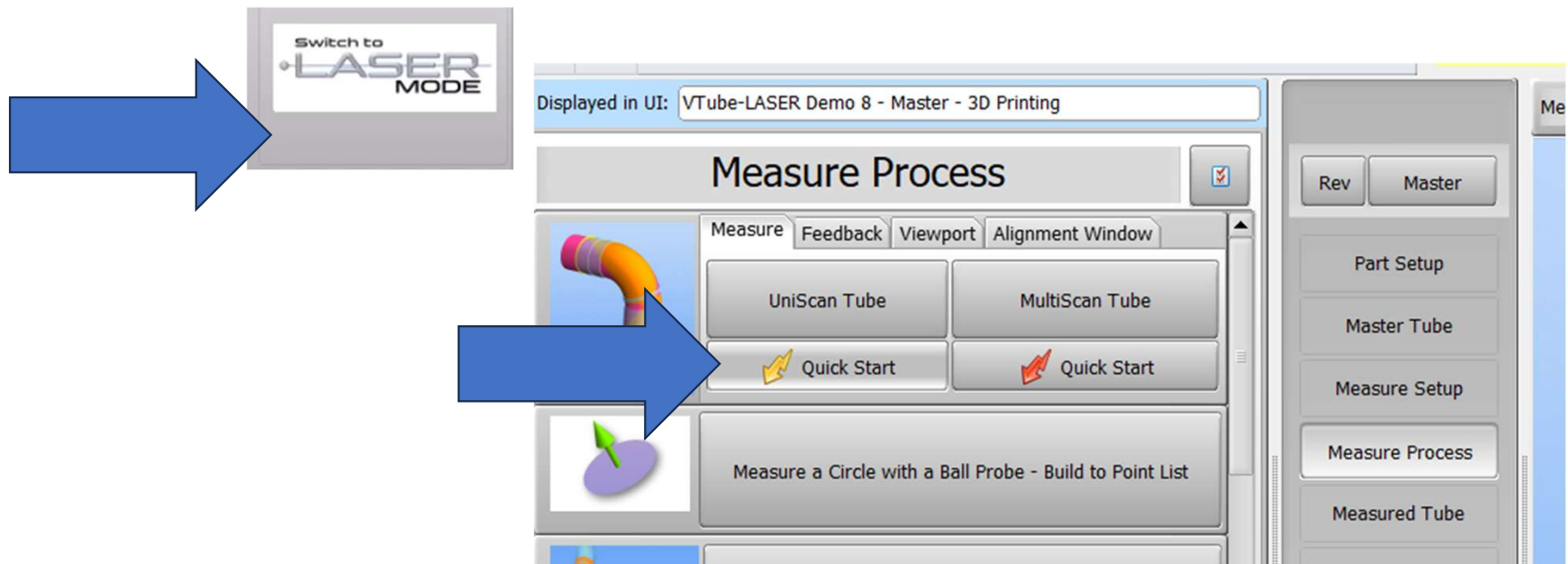
The screenshot displays the VTube-STEP software interface. On the left, the 'Slot Side 2' panel includes options for 'Offset Circle Radii' (0.000 inches), 'Flip the Slot Normal Direction', and 'Offset Slot Plane By' (0.000 inches). Below these are buttons for 'Test Build Round Slot', 'Test Build from Selected Drill Bit Bosses', 'Redisplay Last Test Build Round Slot', and 'Create a Round Slot Space Object'. A green arrow points to the 'Create NEW NOMINAL Round Slot from Current Test Build' button.

The central 'VTube-STEP SPACE OBJECTS' panel features a table with the following data:

Type	Name	vNom	cNom	vMeas	cMeas	Report
Circle	Slot Side 1	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Circle	Slot Side 2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
RSlot	Round Slot 1	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

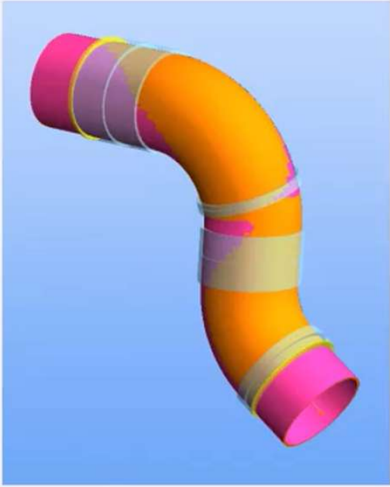
A green arrow points to the 'Round Slot 1' row in the table. The right side of the interface shows a 3D perspective view of a cylindrical part with a slot, with a green arrow indicating the slot's normal direction.

Switch to VTube-LASER and measure the main body of the tube as normal



Align measured to master

After-Measure Alignment



Align using this algorithm

Best Fit Alignment 5

Display a report automatically

Show a report after alignment

Choose the report template to use:

Tube Inspection Report

Align measured to master now

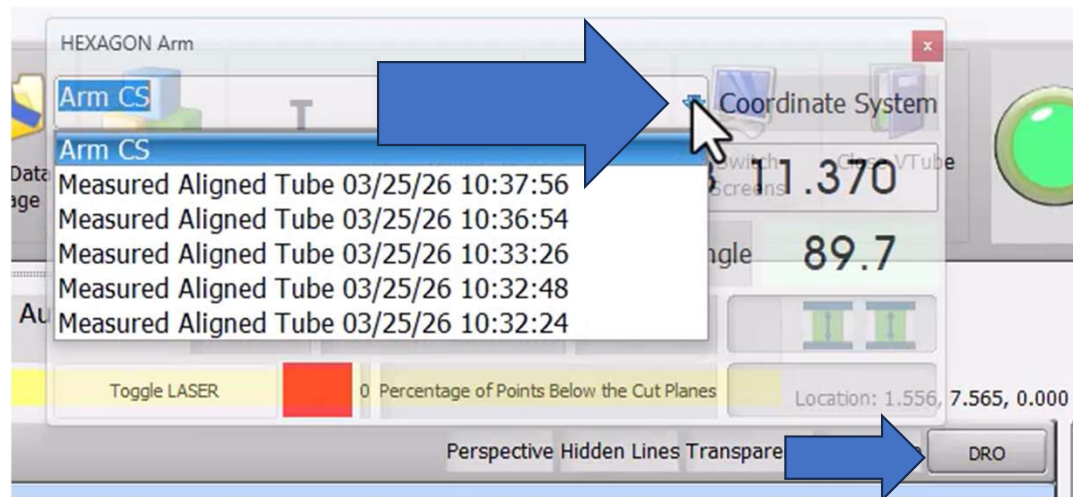
Copy measured to master and close this window

Skip the alignment and close window

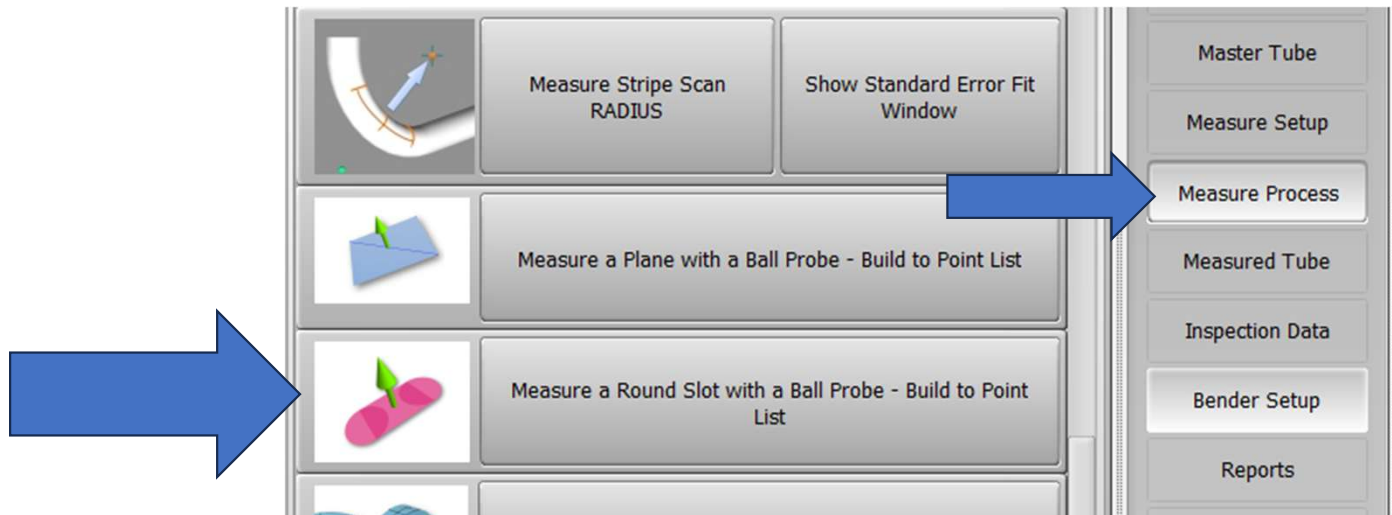
The image shows a software interface for aligning a measured part to a master. On the left, a 3D model of a curved pipe is shown with several colored bands (pink, yellow, orange) indicating measurement points. The main panel contains settings for the alignment algorithm, a checkbox for automatic report generation, and a dropdown for the report template. On the right, there are three buttons: 'Align measured to master now' (with a mouse cursor icon), 'Copy measured to master and close this window' (with a blue arrow icon), and 'Skip the alignment and close window' (with a green arrow icon).

Change the Coordinate System from Arm CS to the most recent Measured Aligned Tube.

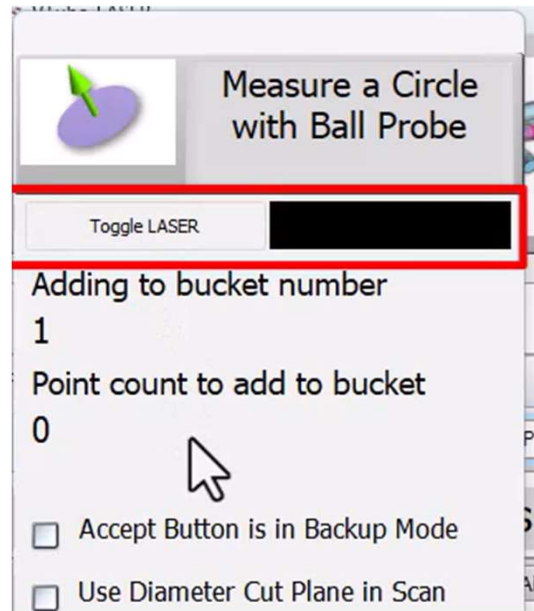
NOTE: The tube CANNOT move between the main measure and measuring the circle



Go back to measure process and select Measure a Round Slot with a Ball Probe



Toggle the LASER OFF

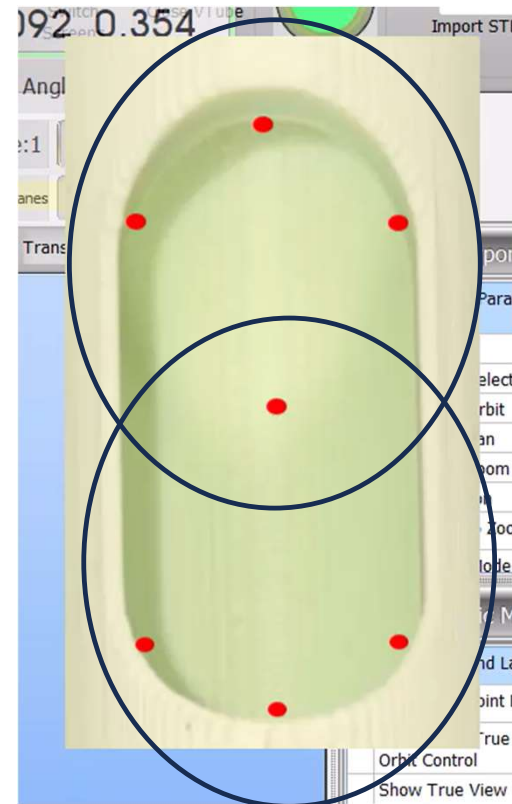


We are going to treat the slot as two individual circle measures

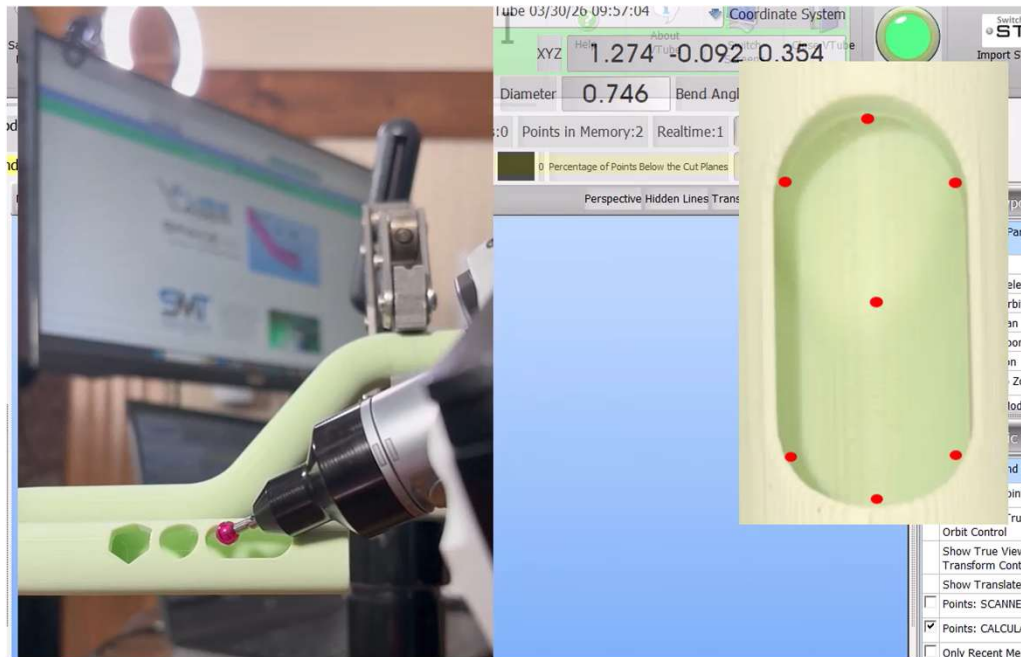
Measure

CIRCLE 1 of 2

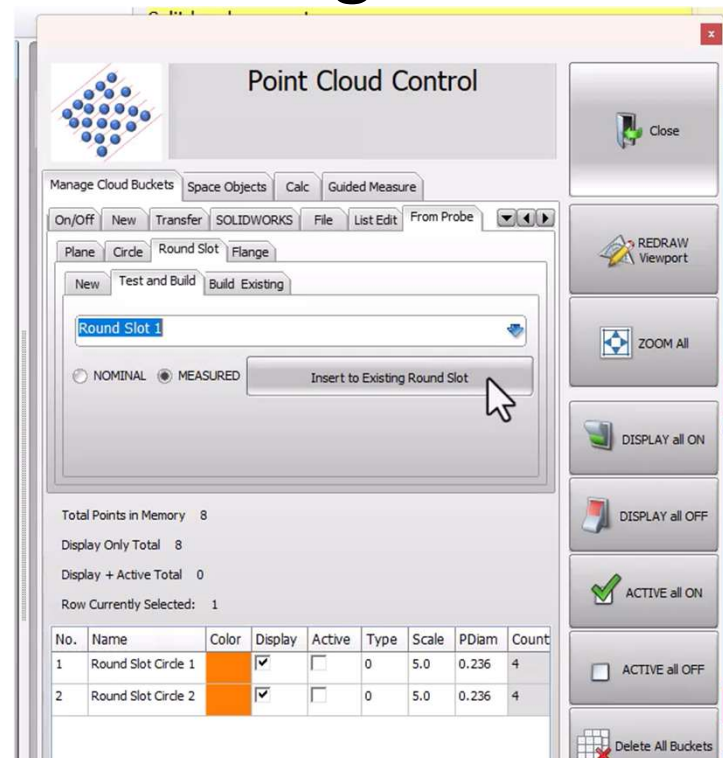
Measure 3 or more circle points, then a point toward/away for probe compensation direction.



Measure 3 points around the perimeter of one side of the slot and a fourth point in the center as an offset point. Repeat on the other side of the slot. Click the rubber button on the arm left or right to accept between sides.



Go to the Test and Build tab and select the Space Object slot for the slot you just measured. Then press “Insert into Existing Circle”



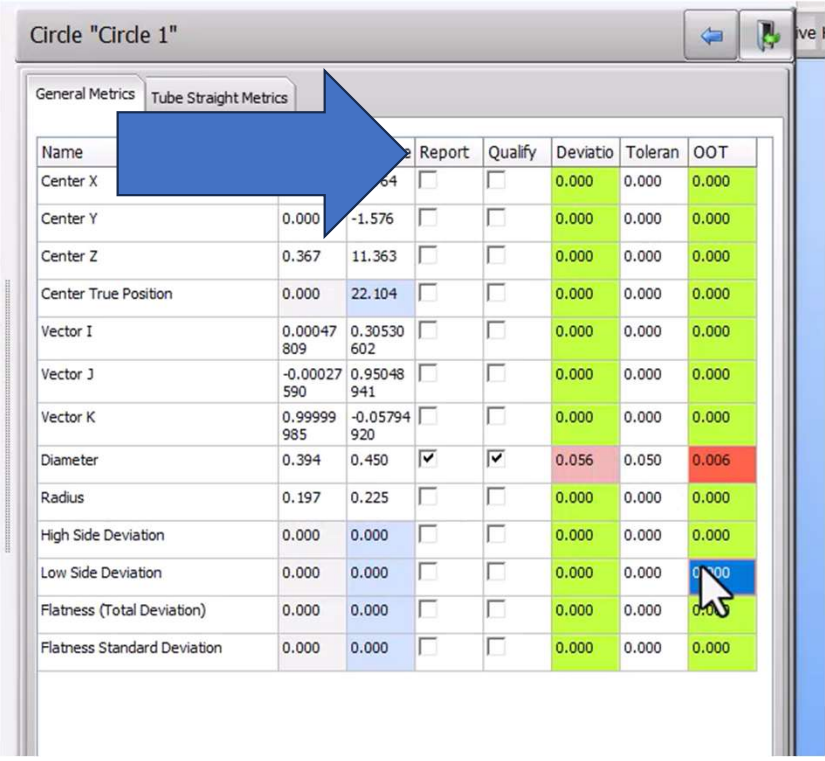
In the Space Object Control list, expand the tabs to view the nominal and measured information

The screenshot displays the VTube-LASER SPACE OBJECTS interface. On the left, the 'SPACE OBJECTS' control panel includes a 'Close' button, a 'Display On/Off' section with 'All Nominal ON', 'All Measured ON', 'All Nominal OFF', and 'All Measured OFF' buttons, and a 'Row Currently Selected: 3' indicator. Below this is a table with columns for Type, Name, vNom, cNom, vMeas, cMeas, and Report. The 'RSlot' row is selected, showing 'Round Slot 1' with vNom checked, cNom highlighted in green, vMeas checked, cMeas highlighted in pink, and Report checked.

On the right, the 'RSlot "Round Slot 1"' window shows a 'General Metrics' tab with a table of metrics. A red box highlights the 'C1 Diameter', 'C1 Radius', and 'C1 Flatness (Total Deviation)' rows. A mouse cursor is pointing at the 'C1 Flatness (Total Deviation)' row.

Name	Nominal	Measur	Report	Quality	Deviatio	Toleran	OOT
Slot Height	0.395	0.453	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
High Side Deviation	0.000	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Low Side Deviation	0.000	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Flatness (Total Deviation)	0.000	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Flatness Standard Deviation	0.000	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
C1 Center X	1.195	1.266	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
C1 Center Y	-0.001	-0.004	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
C1 Center Z	0.374	0.378	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
C1 True Pos	0.000	0.071	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
C1 Vector I	-0.00307 209	0.20530 266	<input type="checkbox"/>	<input type="checkbox"/>	0.00000 000	0.000	0.00000 000
C1 Vector J	0.00147 772	0.21347 654	<input type="checkbox"/>	<input type="checkbox"/>	0.00000 000	0.000	0.00000 000
C1 Vector K	0.00000 419	0.05513 276	<input type="checkbox"/>	<input type="checkbox"/>	0.00000 000	0.000	0.00000 000
C1 Diameter	0.395	0.418	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.023	0.060	0.000
C1 Radius	0.197	0.209	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.012	0.060	0.000
C1 Flatness (Total Deviation)	0.000	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
C1 Flatness Standard Deviation	0.000	0.000	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000

Click on Report and Qualify if you'd like to save the information to a report and set the tolerance



Circle "Circle 1"

General Metrics Tube Straight Metrics

Name	Report	Qualify	Deviatio	Toleran	OOT
Center X	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Center Y	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Center Z	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Center True Position	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Vector I	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Vector J	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Vector K	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Diameter	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	0.056	0.050	0.006
Radius	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
High Side Deviation	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Low Side Deviation	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Flatness (Total Deviation)	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
Flatness Standard Deviation	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000

You can see more information under the Tube Straight Metrics tab after linking the circle to the correct straight

Circle "Circle 1"

General Metrics Tube Straight Metrics

Note: The calculated values for the Space Object NOMINAL values are always linked to the MASTER part.

✔ Link this Space Object to a tube straight

Link to Straight Number: 7

Measured Space Object Calcs Link To: MEASURED-ALIGNED Tube

Name	Nominal	Measure	Report	Qualify	Deviation	Tolerance	OOT
NormV Nearpass Distance	0.002	11.292	<input type="checkbox"/>	<input type="checkbox"/>	0.000	0.000	0.000
NormV Angle to Previous Bend Plane	134.9	44.4	<input type="checkbox"/>	<input type="checkbox"/>	0.0	0.0	0.0
NormV Angle to Next Bend Plane	0.0	0.0	<input type="checkbox"/>	<input type="checkbox"/>	0.0	0.0	0.0
NormV to Centerline Vector	90.0	107.6	<input type="checkbox"/>	<input type="checkbox"/>	0.0	0.0	0.0
INVERTED - NormV Angle to Previous Bend Plane	45.1	135.6	<input type="checkbox"/>	<input type="checkbox"/>	0.0	0.0	0.0
INVERTED - NormV Angle to Next Bend Plane	0.0	0.0	<input type="checkbox"/>	<input type="checkbox"/>	0.0	0.0	0.0
INVERTED - NormV Angle to Centerline Vector	90.0	72.4	<input type="checkbox"/>	<input type="checkbox"/>	0.0	0.0	0.0
Clock from Previous Bend Plane (Circ in Front)	134.8	127.5	<input type="checkbox"/>	<input type="checkbox"/>	0.0	0.0	0.0
Clock from Next Bend Plane (Circ in Front)	0.0	0.0	<input type="checkbox"/>	<input type="checkbox"/>	0.0	0.0	0.0

View the information you wish to see on the Space Objects report

The screenshot displays the VTube-LASER software interface. On the left, the 'Reports' menu is open, showing a list of report templates. A blue arrow points to the 'Space Objects' report template. The main window, titled 'VTube Report', is open, showing a 3D model of a tube assembly and a 'Space Objects Qualification List' table.

Report Templates

	Name	Format
1	Tube Inspection Report	HTML
2	Thales	HTML
	Tube Inspection - SAE J2551-1	HTML
	Space Objects	HTML
6	End Trim Profile Report	HTML
	Straight Cylinder Profile Data	HTML
7	Bend Profile Qualification Report	HTML
8	VTube-LASER Scan Score	HTML
9	Long Inspection Report	HTML

VTube Report

Print | Export to PDF | Export to File | Setup | Preview

Print | Print + Quick Export | Quick Export | Close

Press Quick Export to send backups of this report to path: C:\Users\Public\Documents\VTube\

VTube REPORT

VTube-LASER Demo 8 - Master - 3D Printing

Date/Time: 3/25/2026 10:53:11 AM
Part Number: VTube-LASER Demo 8 - Master - 3D Printing

Space Objects Qualification List

Object Name	Metric	Nom	Meas	Dev	Tol	OOT
Circle 1	Diameter	0.394	0.450	0.056	0.050	0.006