

# VTUBE LASER

# The power of LASER



## FEATURES

- Import solid model data from STEP or IGES files generated by CAD packages to create MASTER data.
- Measure tube shapes using laser technology for comparison against master data or to reverse-engineer from existing parts.
- Fully qualify tube shapes with inspection reports that contain tangent, midpoint, end angle deviations all compared to tolerance. Quickly verify a part shape by viewing the inspection result with shades of green (pass) or red (no pass).
- Display rendered image of measured tube, best-fit tube, and master tubes on the screen at the same time.
- Connect to and correct CNC benders.

# VTUBE LASER



Item A	Item B	Angle A	Angle B
0.348	0.700	0.015	0.011

Len Master	Len Measured	Len Long	Dist Check	CC Long
26.907	28.015	1.108	19.947	0.791

T1	T2	MP	MP1	T2	T21
0.012	0.039	0.007	0.039	0.011	0.039
0.023	0.039	0.016	0.039	0.008	0.039
0.007	0.039	0.008	0.039	0.008	0.039
0.005	0.039	0.003	0.039	0.010	0.039
0.014	0.039	0.013	0.039	0.013	0.039

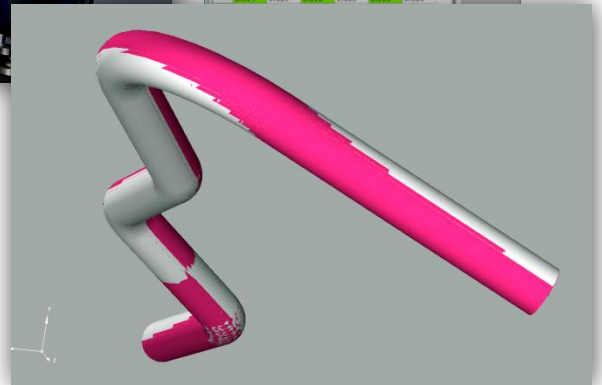
**INSPECTION DATA**  
Use this data to qualify a part

Straight	T1d	T1t	MPd	MPt	T2d	T2t
1	0.010	0.039	0.004	0.039	0.011	0.039
2	0.017	0.039	0.011	0.039	0.005	0.039
3	0.005	0.039	0.004	0.039	0.004	0.039
4	0.004	0.039	0.003	0.039	0.007	0.039
5	0.009	0.039	0.009	0.039	0.009	0.039

**BENDER ADJUSTMENTS**  
Add this data to the bender data to correct the shape of the tube

Bend	Length	Rotation	Angle
1	-0.890	0.0	0.0
2	-0.017	-0.1	-0.1
3	0.008	0.1	-0.2
4	0.028	0.0	-0.2
5	-0.768		

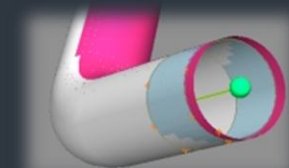


## Tube measuring software for FARO laser and tactile measuring centers

This is the application tool designed exclusively for **tube measurement, qualification, and bender correction.**

VTube-LASER connects directly to FARO Laser ScanArms using the FARO laser line probe technology to scan tube shapes faster with greater accuracy.

Correct your network of CNC benders. Setup and correct a bender in just a few minutes. Transfer of correction data takes a few seconds.



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## FARO LASER Compatible



VTube-LASER is designed to be used exclusively on FARO ScanArms like the Quantum, Platinum, Fusion, Titanium, and Advantage arms.



VTube-LASER uses v2 or v3 Laser Line Probes

### FARO TECHNOLOGIES

Our software supports FARO arms exclusively and is distributed exclusively through FARO Technologies.

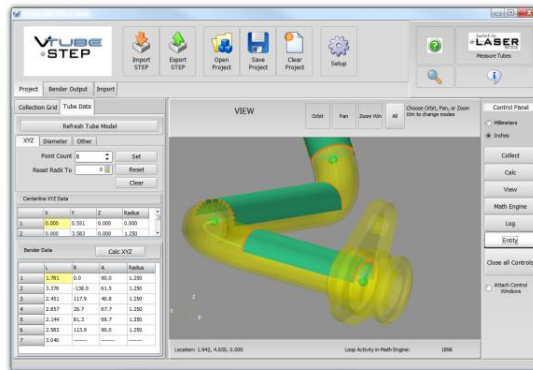
### IMPORT SOLID MODEL

Import from any solid model CAD package using the universal STEP or even IGES format.

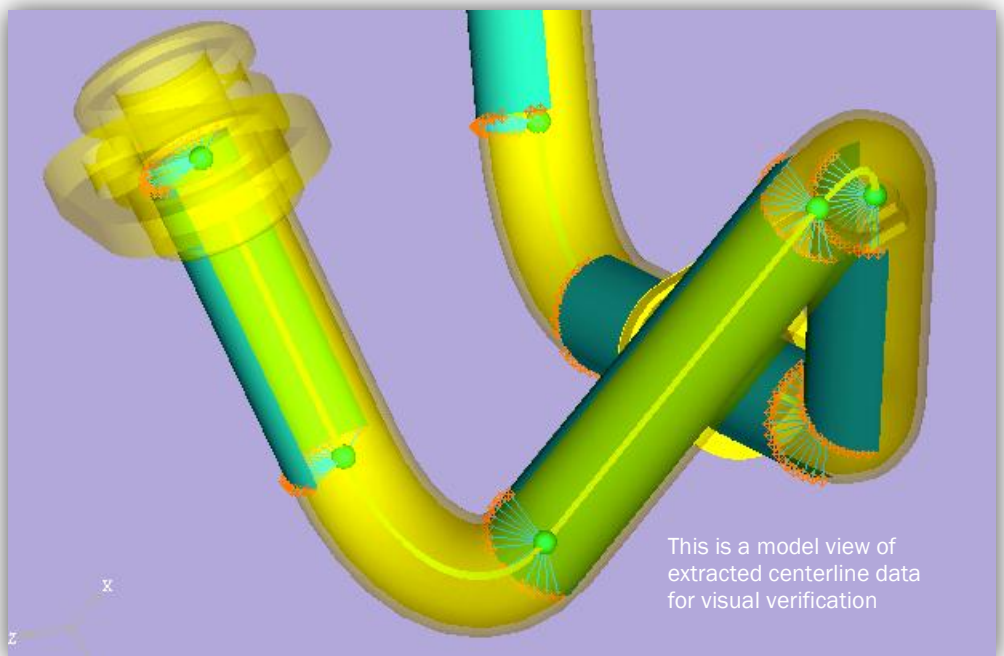
### EXTRACT CENTERLINE DATA

Extract centerline data to build MASTER data for inspection. View the results of the extraction in the viewport using transparency.

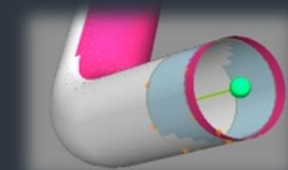
## SOLID Model IMPORT



Import MASTER data from the world-wide standards of STEP or IGES files – which means you can import from any solid model package.



This is a model view of extracted centerline data for visual verification



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## VTUBE LASER INSPECTION

### VISUALIZE DEVIATIONS

The measured tube is fit on the master tube using sophisticated fit technology then displayed on the screen for visualization.

### INSPECTION GRID

#### COLOR CODES

**Solid Green:** The deviation is  $\frac{1}{2}$  of the tolerance or better

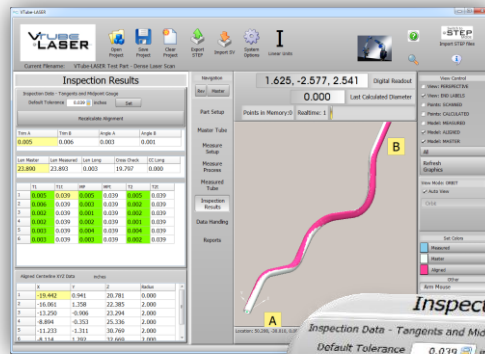
**Light Green:** The deviation is less than the tolerance but greater than  $\frac{1}{2}$  tolerance

**Light Red:** The deviation is greater than the tolerance – but less than 2 times the tolerance.

**Solid Red:** The deviation is greater than or equal to 2 times the tolerance.

### Part Qualification

Fully qualify the part using the Inspection Results grid. Color codes give a quick indication of pass/fail for part qualification. Print customizable inspection reports to document the qualification.



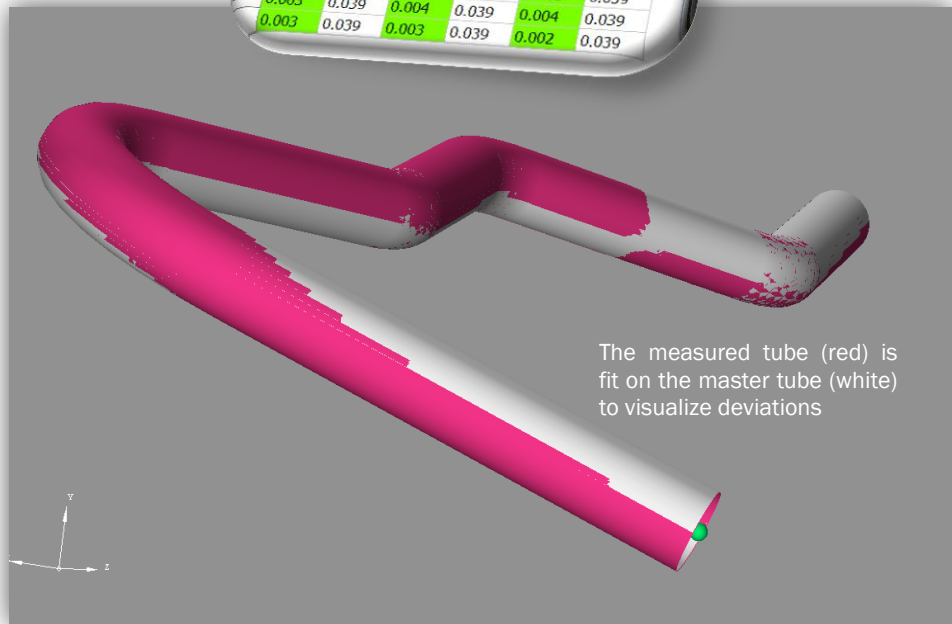
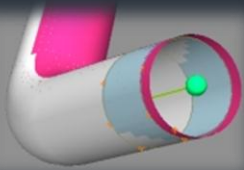
**Inspection Results**

Inspection Data - Tangents and Midpoint Gauge  
Default Tolerance: 0.039 inches

Trim A	Trim B	Angle A	Angle B
0.005	0.006	0.003	0.001

Len Master	Len Measured	Len Long	Cross Check	CC Long
23.890	23.893	0.003	19.797	0.000

	T1	T1t	MP	MPT	T2	T2t
1	0.005	0.039	0.005	0.039	0.005	0.039
2	0.006	0.039	0.003	0.039	0.002	0.039
3	0.002	0.039	0.001	0.039	0.002	0.039
4	0.002	0.039	0.002	0.039	0.001	0.039
5	0.003	0.039	0.004	0.039	0.004	0.039
6	0.003	0.039	0.003	0.039	0.002	0.039



The measured tube (red) is fit on the master tube (white) to visualize deviations



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## VTUBE LASER BENDERLINK

### Bender Communication

Connect to benders using the VTube-LASER Benderlink system. Network to any number of benders on your shop floor to correct the benders to the correct part shape in a few minutes.

#### BENDERLINK SOLUTIONS

We can help you integrate CNC Bender to measuring centers of nearly any type. We're known as the Benderlink specialists.

#### TECHNICAL SUPPORT

We offer our LogMeIn Rescue service to remotely access your CNC Bender computer for tech-support.

#### KNOWLEDGEBASE

We have an unparalleled web-based knowledgebase that is available to all our customers for details about our products – including revision details and technical documents.

**Bender Setup**  
 Bender Number: 1  
 Bender Name: PINES CNC  
 Protocol: SVNET

Display Linear Units:  Millimeters  Inches

These values are what are stored at the BENDER. BENDER data is often different than the MASTER and MEASURED data.

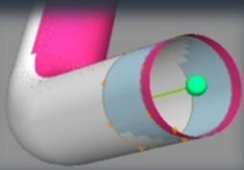
Part Number: 60-13311\_asm

Use Diameter: 0.625 inches  
 Use Wall: 0 inches  
 Cut Length: 27.388 inches

Set Cut Length From MASTER Calculation

	L	La	L+La	R	Ra	R+Ra	A	Aa	A+Aa	Radius
1	1.781	0.022	1.803	0.0	0.1	0.1	90.0	2.8	92.8	1.250
2	3.376	0.001	3.377	-138.0	0.2	-137.8	61.5	1.9	63.4	1.250
3	2.451	-0.012	2.439	117.9	0.1	118.0	40.8	1.3	42.1	1.250
4	2.857	-0.018	2.839	29.7	-0.2	29.5	67.7	2.0	69.7	1.250
5	2.144	0.015	2.159	81.3	-1.3	80.0	69.7	2.0	71.7	1.250
6	2.583	0.032	2.615	113.9	1.1	115.0	90.0	2.8	92.8	1.250
7	3.040	0.022	3.062							

Buttons: TRANSFER Master into Grid, Undo, Setup BENDER, Send DATA to the BENDER (no adjustment), Adjust the BENDER, 1 RECALL Data from the BENDER, 2 ADJUST Data then Send to the BENDER, 3 CLEAR Adjusted Data in Setup GRID



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## EXTEND or TRIM and CROSS-CHECK

The inspection report shows "extend" or "trim" for end measurements, and a "cross-check" straight measure for end-to-end deviation from the master part.

Inspection Results					
Inspection Data - Tangents and Midpoint Gauge					
Default Tolerances: 0.029 inches					
Recalculate Alignment					
Trim A	Trim B	Angle A	Angle B		
0.005	0.006	0.003	0.001		
Lar Master	Len Measured	Len Long	Cross Check	CC Long	
23.890	23.893	0.003	19.797	0.000	
T1	T1L	MP	MP1	T2	T2L
1	0.005	0.039	0.005	0.039	0.039
2	0.006	0.039	0.003	0.039	0.002
3	0.007	0.039	0.001	0.039	0.007
4	0.002	0.039	0.002	0.039	0.001
5	0.003	0.039	0.004	0.039	0.004
6	0.003	0.039	0.003	0.039	0.002

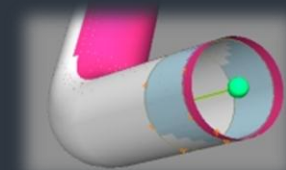
## TACTILE OPTIONS

Control the direction of ball-probe offset along the centerline for end trip projections.

End-Scans

Offset End A Toward Bend

Offset End B Toward Bend

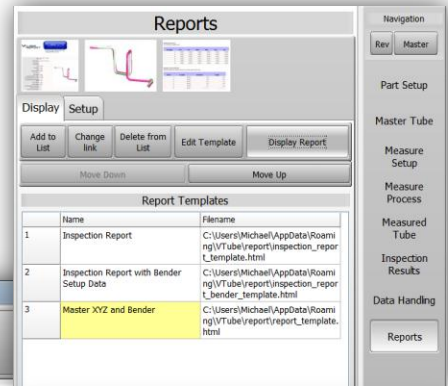


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# VTUBE LASER

## Flexible Reporting

Design the reports using HTML report templates using our sample reports. Add any number of custom report templates to the list - ready for use in different situations.



Point	X	Y	Z	Radius
1	-16.914	2.058	30.097	
2	-15.797	2.778	24.360	
3	-23.927	2.466	14.235	

Point	X	Y	Z	Radius
1	0.000	0.000	0.000	1.762
2	7.880	0.000	0.000	2.000
3	-4.281	-9.994	0.000	2.000
4	-4.574	-11.468	0.000	2.000
5	1.480	-13.090	0.000	2.000
6	1.677	-13.877	0.000	2.000

Bend	Length	Rotation	Angle	Radius
1	2.945		44.2	2.000
2	2.099	179.6	44.4	2.000
3	2.056	91.0	89.2	2.000
4	2.049	-150.5	88.9	2.000
5	2.004	-88.2	29.5	2.000
6	3.068			

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```

Reports are based on web-compatible files. Display the reports in any web browser.

Edit the report templates with an editor that installs with VTUBE-LASER.

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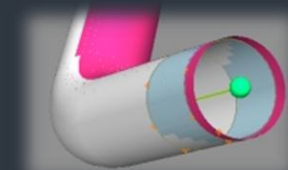
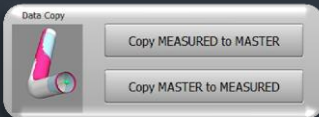
## SCAN RATE FILTER

The Scan Rate Filter controls the rate at which VTube brings in scan data. The filter can be set for either DISTANCE or TIMER. For example, you can setup VTube to take in scanned points that are separated by at least a millimeter.

1	Cylinder Scan Type	Timer	
2	Cylinder Scan Timer	125	milliseconds
3	Cylinder Scan Distance	0.020	inches
4	End Scan Type	Timer	
5	End Scan Timer	0	milliseconds
6	End Scan Distance	0.004	inches

## COPY MEASURED to MASTER

Reverse-engineering is simple: Copy MEASURED to MASTER data with the single press of a button in the Data Handling menu.



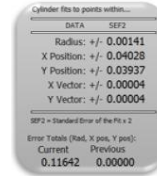
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# VTUBE LASER

## Feature List



Keep projects from other measuring centers that use Supervision data - because you can import Supervision projects directly into VTube-LASER.



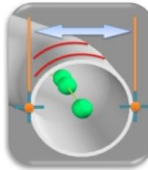
Clear messages help you know if a measurement is trustworthy. You can choose to remeasure or continue any time.

Master Centerline XYZ Data		
	X	Y
1	0.000	0.000
2	7.808	0.000
3	4.391	-6.964

Enter MASTER data from a print or extract master data from a solid model from any solid model program.



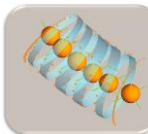
Move long tubes in the middle of measurements.



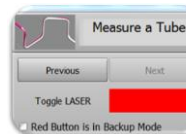
VTube calculates the diameter in realtime. There is no need to enter a nominal data to calculate the value.



Print reports with your own company logo to a printer or a PDF file.



Measure a radius using our unique radius segment-scan method to average the radius value over the entire bend.



You can choose to remeasure straights or backup to previous straights at any time.



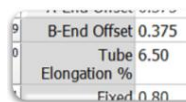
Reverse-engineer a part in just a few minutes. Enter a part name, a default radius, and then begin measuring.



Calculate the cut-length.



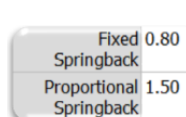
Perform precise best-fit alignments and inspection reports to qualify a tube shape.



Use tube elongation percentage value to compensate the cut length.



Measure with a ball-probe or a laser scanner - or even both in the same tube.



Use fixed and proportional springback values to automatically adjust bender data for bend springback.



Use quick end-sweeps that never miss or generate an error.



Connect directly to networks of benders for bender correction.