VERSION 2.8

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VTUBE-LASER ADVANTAGES

COMPARED TO OTHER SYSTEMS

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ICON LEGEND

This icon means Advanced Tubular Technologies invented and/or were the first to introduce this technology for the tube fabrication industry.

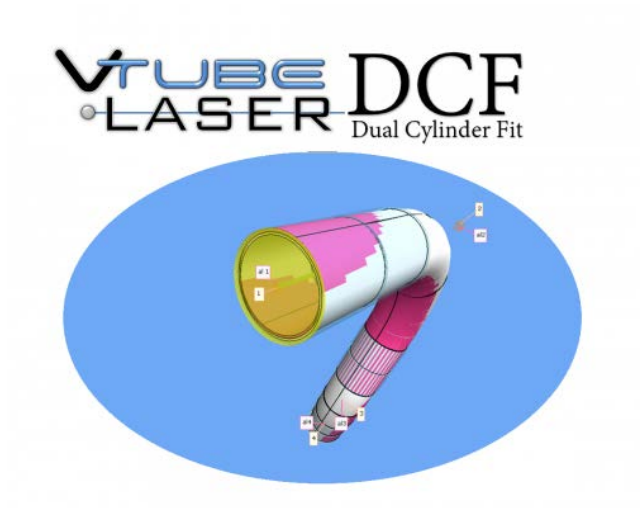
This icon means that the technology is unique to VTube-LASER when compared to other tube fabrication measuring systems.

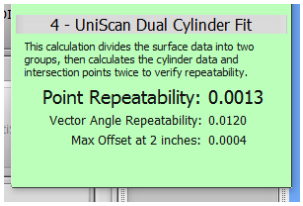
ADVANTAGES LIST

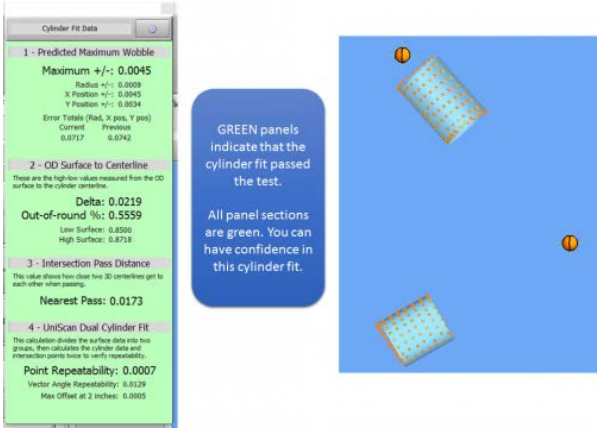
THE DCF (DUAL CYLINDER FIT) ENGINE MEASURES TWICE WHEN USERS MEASURE ONCE

We invented DCF in 2017.

No other system uses this feature.







DCF (Dual Cylinder Fit) is the major enhancement for VTube-LASER in version 2.8 (April 2017) because...

1. It replicates measuring the tube TWICE in one pass when the user measures the tube the first time.
2. It requires 4 total pass-fail checks for cylinder calculations.

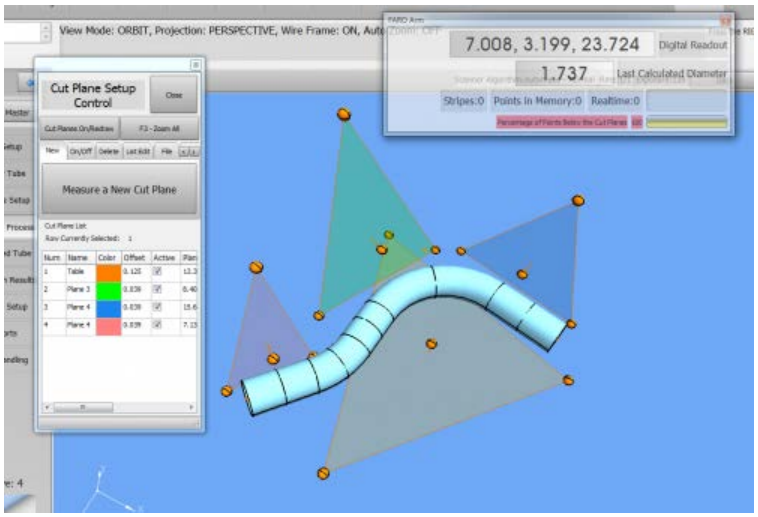
The goal is to ensure repeatability of the cylinder measurements on-the-fly using a LASER scanner.

See DCF - Dual Cylinder Fit for details.

CLAMPS ARE NOT NECESSSARY - MEASURE TUBES ON ANY TABLE OR FLOOR WITH CUT PLANES

This feature is like the generic Geomagic "Clip Plane". However, this is the first tube fabrication application to use the idea.

Competing fork-probe measuring systems cannot use this feature.



Work holders with clamps are not needed with VTube-LASER. Measure the table surface as a Cut Plane, then lay the tube on the table during scanning. VTube-LASER will automatically ignore the table.

This has an advantage of allowing flexible tubes to rest on a large surface to control flexing - rather than placing them in tube clamps.

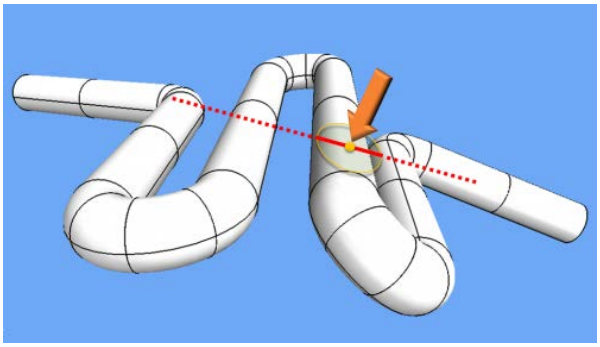
- See VTube-LASER Cut Planes

THE DCP (DIAMETER CUT PLANE) FEATURE REMOVES BACKGROUND DATA AUTOMATICALLY

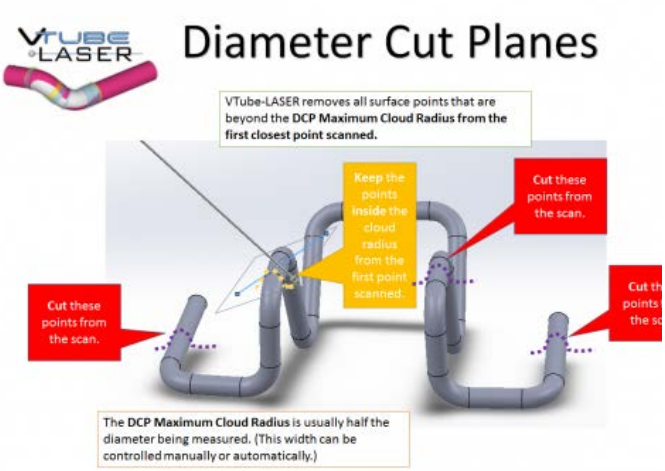
We invented DCP in 2016.

No other tube measuring system uses this feature.

Only VTube-LASER uses DCP (Diameter Cut Planes) to keep the first tube the laser finds and remove any other tube (or any object) scanned beyond allowed DCP radius width limit.



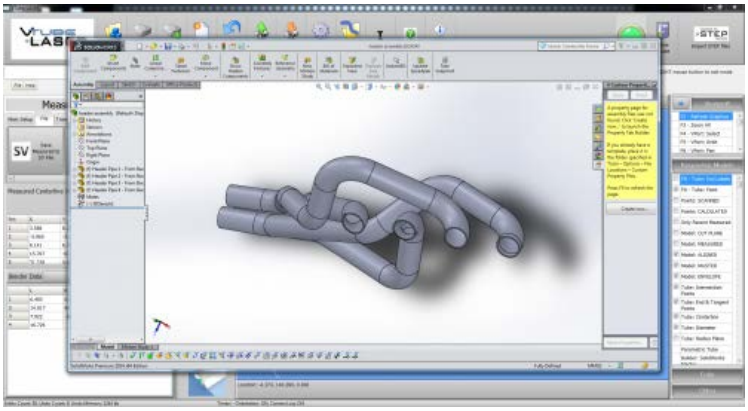
For example, Holly MSD uses this feature to scan tube headers.



- See DCP - Diameter Cut Planes

AUTOMATICALLY BUILD 3DSKETCH PARTS IN SOLIDWORKS

We are unaware of any other tube measuring system that can duplicate this feature.



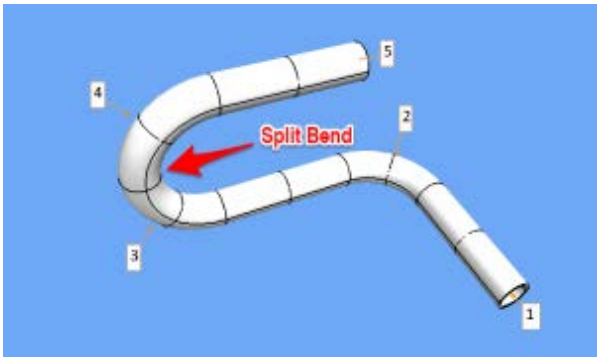
VTube-LASER can draw a measured part in SOLIDWORKS in just a few seconds. In this image, we measured four tubes in VTube-LASER, automatically drew each part in SOLIDWORKS, then combined the four parts into an assembly using the SOLIDWORK's assembly feature.

- See VTube-LASER Video 58
- See Building Tube Assemblies in SOLIDWORKS

SPLIT BEND MEASUREMENTS HANDLE 180-DEGREE BENDS ACCURATELY

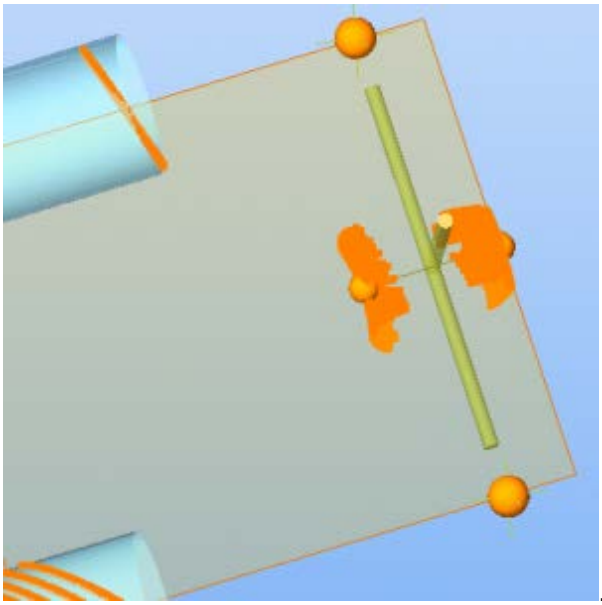
We invented the SPLIT BEND feature in 2011.

Fork-probe measuring systems must treat 180-degree bends as if they have a straight (which they don't). This can create a high wobble deviation in the centerline creation.



This feature solves a huge accuracy problem that many other measuring centers have when trying to handle 180-degree bends.

VTube-LASER uses the SPLIT BEND process to accurately measure any bend that equals or exceeds 180 degrees using math based on point-cloud data from the inside and outside apex area of the bend.



Any collapse or ovality in the bend region **does not reduce the accuracy of the Split Bend centerline placements** in VTube-LASER.

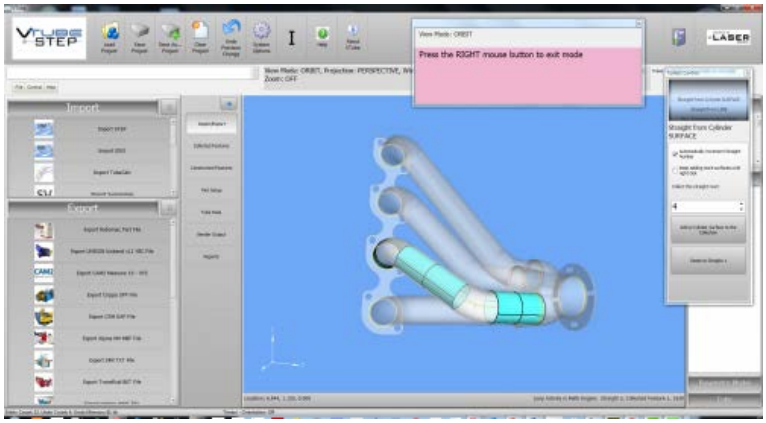
VTube-LASER assumes that the bend is an unpredictable shape and uses math that finds the exact center of *whatever shape it measures* at the apex of the bend.

- See VTube-LASER Video 40
- See Video 54 for how to setup for a Split Bend.

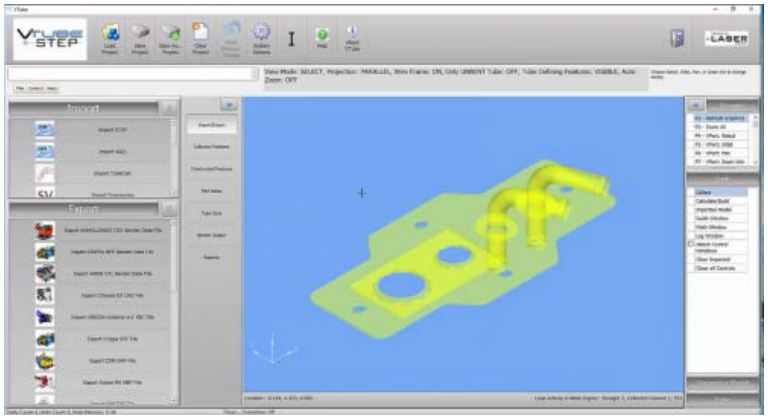
For details, see the VTube-LASER Split Bend Feature page.

TROUBLE-FREE IMPORT OF TUBE MODELS FROM ENTIRE ASSEMBLIES WITH COMPONENTS

Other systems may struggle with importing tubes with extra objects in the file.



VTube-LASER can import entire assemblies in STEP and IGES formats. This software lets you find the centerline of any solid model tube inside any assembly.



VTube can even find the centerlines of straights that are drilled with holes or end copings.

BUILT-IN EXTENSIVE BENDER COMMUNICATIONS

Some competitors require that you purchase bender communications functionality.

VTube-LASER includes communication with up to 100 benders with no additional license charge for many bender types.

- See one protocol example: Setup VTube for Supravision Network Communication

ONE PROBE FOR ALL DIAMETERS - EVEN STRING CENTERLINES

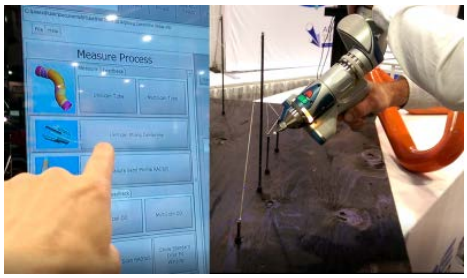
Competing fork-probe measuring systems cannot duplicate this feature. They must change fork probes for wide ranges of diameters. Also, to the best of our knowledge, no other systems can measure STRING centerlines like VTube-LASER can.

VTube-LASER is completely immune to diameter changes **because it measures the diameter on-the-fly**. (The diameter value entered in Part Setup is only for visualizing the model on the screen.)

This means that VTube-LASER can measure ANY diameter without changing the probes or scanners. The same scanner can measure a paper clip or a 12-inch diameter pipe.

VTube-LASER uses the FARO ScanArm capability to measure a tube using either the ball probe or the laser probe – all in the same tube. This feature lets you alternate measuring technique depending on what works best for each straight.

VTube-LASER even has a feature for measuring CENTERLINE STRINGS. We added this for the US Navy.



SCANS SURFACES TO COLLECT DENSE POINT-CLOUD DATA

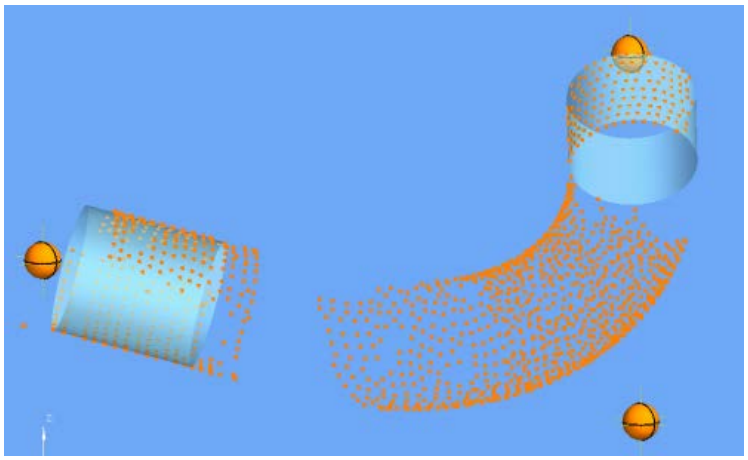
Vision-based systems examine the OD silhouette only. Fork-probe systems use a sliver of data from either tangent on each straight.

VTube-LASER takes in an actual point cloud of the diameter surface then solves for a centerline cylinder.

This is why VTube is immune to changing diameters, and why it always returns the Out-of-round% for every measure.

VTube-LASER has built-in filters that let you control the density of the point cloud on the scanned surface.

If you want to, VTube can even scan the bend sections to give you the actual average radius value (shown in the image).

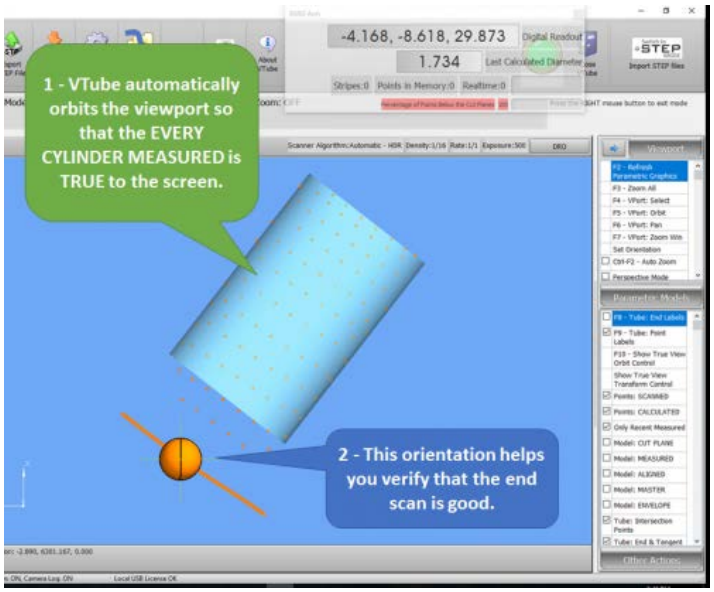


BETTER REAL TIME VISUAL FEEDBACK WITH SURFACE POINTS AND GEOMETRY IN TRUE VIEW ORIENTATIONS

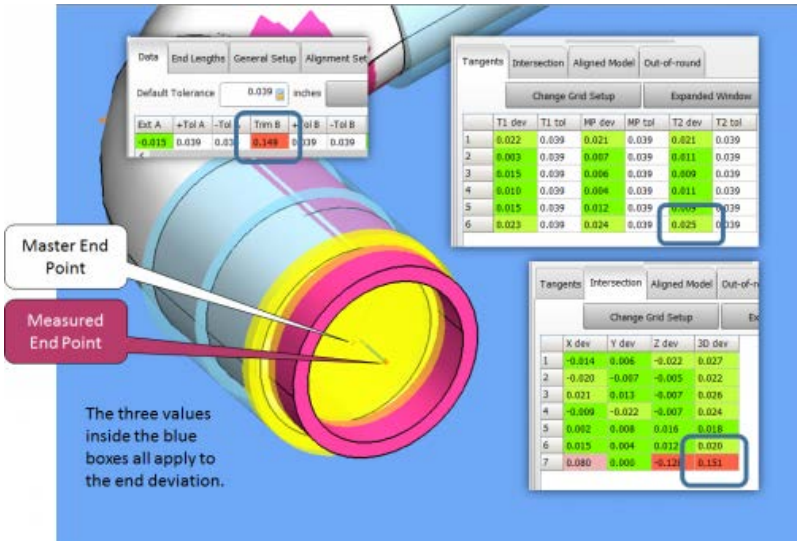
Heavy surface point display has been part of VTube from the beginning. The TRUE VIEW feature was added in version 2.8 in April 2017.

Other systems hide much of the real time feedback or show none at all.

VTube-LASER shows you the actual model of the scanned points on the screen immediately after the scan in its TRUE VIEW orientation. This allows the operator to visually verify that the scan was good before moving to the next straight or end. If there are outliers or flyers - you can easily see them in this screen. (See the top image.)



After the inspection is complete, VTube creates solid model images that are designed to clearly show you where the tube passes or fails the tolerance envelope. In the bottom image, it is easy to see that the measured-aligned tube (the pink tube) is too long because it moves far past the end length tolerance envelope - which has turned bright yellow because the measured tube is outside the envelope.



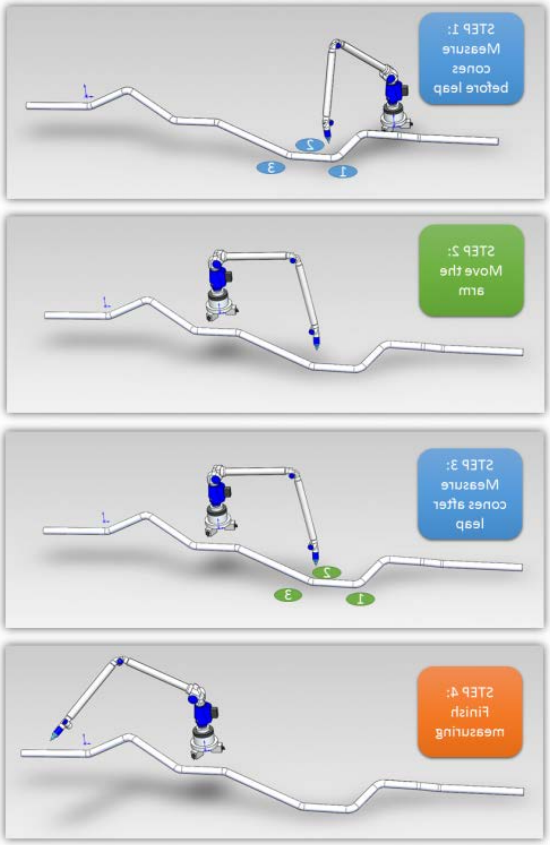
You can see exactly how far it exceeds the tolerance by looking at the Inspection Results grids.

USES THE MORE-ACCURATE LEAPFROG FOR MEASURING TUBES LONGER THAN THE ARM REACH

Some systems rely on less-accurate and less-flexible MOVE commands for longer tubes.

The LEAPFROG feature allows VTube-LASER to measure any length tube shape accurately by moving the arm around longer tubes and pipes.

This method of measuring tubes longer than the arm's reach is far more accurate than operations that use TUBE MOVES.



Leapfrog also works regardless how long the preceding straight is. When other systems use a MOVE command, they require you to measure a preceding bend or two. VTube-LASER can measure even a straight tube with no bends that is longer than the arm reach with leapfrog.

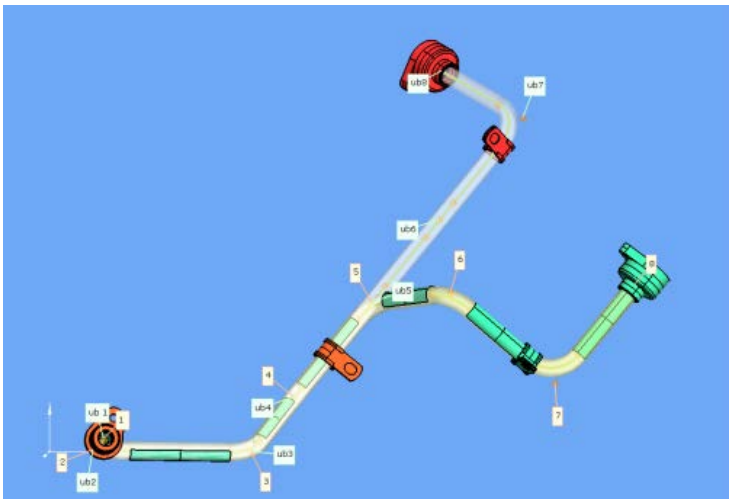
- See VTube-LASER Leapfrog

INCLUDES THE POWER OF VTUBE-STEP

We introduced VTube-STEP on March 15, 2010.

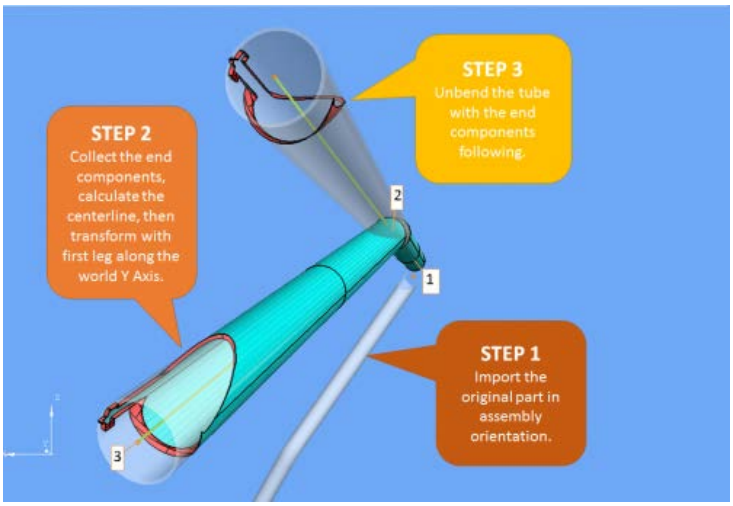
No other system includes VTube-STEP as part of the software license.

Every VTube-LASER comes with VTube-STEP because the **MBD** (**Model-based Definition**) STEP mode is the foundation of VTube-LASER mode.



Not only can you import any solid model - but you can do some very complex operations on them as well. For example, you can unbend the parametric tube with components or holes following the unbend. And you can include elongation in the unbend too.

In the top image, VTube has unbent part of the tube with end solid model components and brackets following. This new unbent configuration can be exported to any solid modeling package with the STEP EXPORT feature.

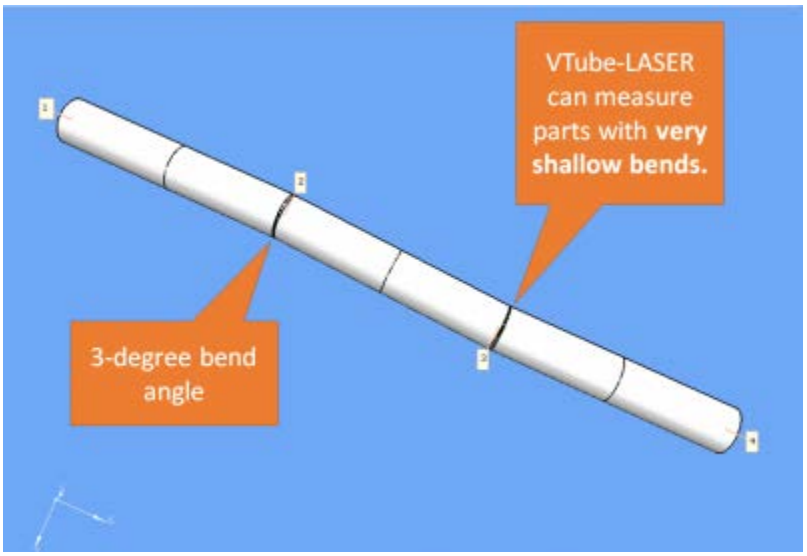


In the bottom image, we've used VTube to prepare a tube shape with coping on either end for export to a LASER cutter CAD software package.

HANDLES TUBES WITH SMALL-ANGLED BENDS

Vision-based systems cannot easily measure tubes with small-angled bends.

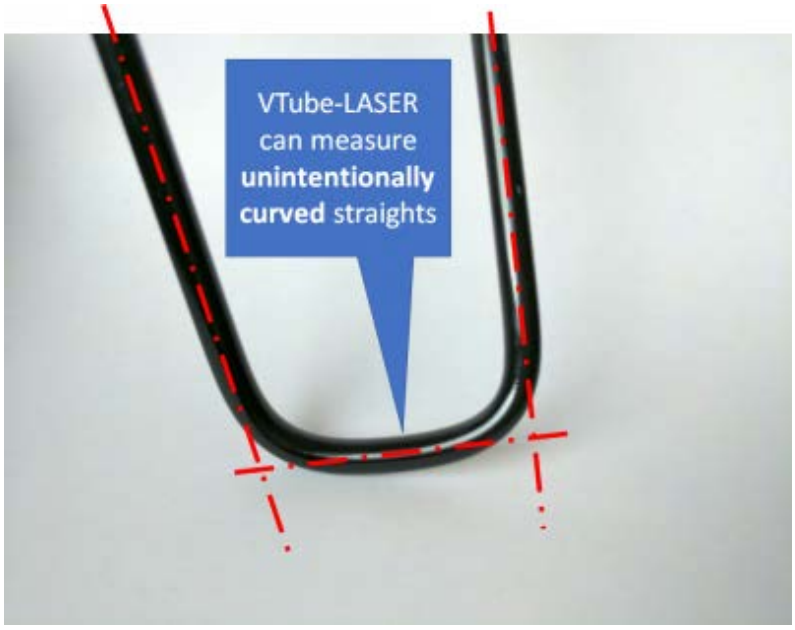
VTube-LASER can measure tubes with very small bend angles.



HANDLES UNINTENTIONALLY-CURVED STRAIGHTS

Some systems may not be able to measure bowed straights well.

VTube-LASER can measure curved straights using the **MULTISCAN** feature.



TARGET MARKET

- VTube-LASER is for any customer that measures and qualifies tube shapes.
- This is true even if the customer already uses a generic software solution like POLYWORKS or GEOMAGIC. Customers that use these packages always prefer to measure tube shapes in VTube-LASER because VTube-LASER is much easier to use (they tell us that all the time).
- Adding VTube-LASER to existing customer systems is cost effective. VTube-LASER is still one of the least-expensive licenses on the market, compared to other solutions.
- If the customer uses tube bending machines, then VTube-LASER is very justifiable because it can correct bending machine programs quickly. VTube-LASER saves hours per setup for each new part. One customer reported to us that **they reduced their setup scrap rate by 95% with VTube-LASER**.

SOFTWARE MAINTENANCE PLAN (SMP) SUPPORT

- Every new license includes one year of **free updates** with our SMP.
- Every new license includes one year of technical support by telephone, email, and/or remote internet connection with the SMP.
- Every customer with an active SMP has direct access to the VTube-LASER software developers. We do not hide from customers.
- SMPs can be renewed annually for 20% of the current license price of VTube-LASER. We do not require SMP renewal.

INTERNATIONAL ON-SITE TRAINING

Our on-site training rates are currently the SAME EVERYWHERE IN THE WORLD. (This may change in the future.)