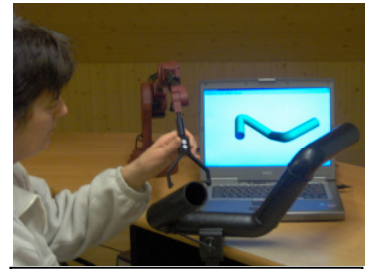# Delta-3D-Tube

Smart tube design and measurement

## D3D-Tube with non-contact tube-probe

3900 €

D3D-Tube double-click probe

The HiTech D3D-Tube probe with the innovative infrared technology is available in four different sizes. It can be combined with any flexible measuring arm (e.g. Cimcore/ MicroScribe). Small wires or large tubes can be digitized in a few seconds with a simple 2-point non-contact measurement. An added turn-joint allows a very flexible and easy measurement handling. Digitizing can't be faster: Twice a „clic-clac" and the next part of tube is digitized and appears on the screen! For reverse-engineering, quality control, bending correction or for digitizing master tubes.

D3D-Tube online NC data

Simultaneously with measuring procedure or while manually changing any tube parameters the actually needed bending process is checked in the background. With a keypress the NC-data for the tube-bending machine or for the 5-axis laser-cutting machine is generated then.
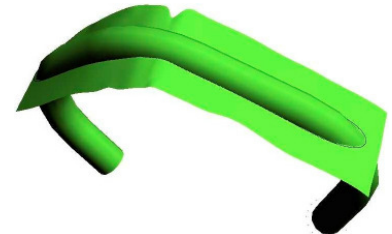

D3D-Tube virtual tube gauge

A measured tube can be treated as a virtual tube-bending-gauge. The actually bended tube can be checked with the built-in bestfit procedure against the digitized virtual tube gauge. The calculated deviations are even visualized on the screen. Useful for prototypes or small series of tubes. That way you don't have to manufacture an expensive tube-gauge. The virtual gauge is faster, cheaper, more flexible and even more precise. An existing tube-gauge can be digitized in the same way, using a special gauge-probe. If the prototype doesn't match the given master tube you can calculate the fault (flex) of the bending procedure and compensate automatically for that. Doing so, the second prototype will match perfectly!

D3D-Tube rubberband designer

With a flick of the wrist the measuring arm has turned into a 6-dimensional mouse. The tube can now be conducted around the previously digitized obstacles. The shape of the tube can be arbitrarily changed as long as it fits as desired. Like a virtual rubberband the tube on screen follows the movements of the measuring tip while the bending data is automatically actualized.
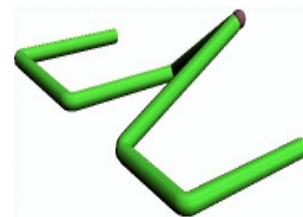
D3D-Tube realtime simulation

Tube construction can be based on both, on bending parameters or on xyz-values. Together with any change of a parameter, the modified tube appears immediately on screen. The needed bending procedures are collision-checked real-time in the background, following the WYSIWYG-paradigm (=What You See Is What You Get).

D3D-Tube open interface

Obstacles and tubes can be easily imported and exported as ASCII text files, as NC data or as CAD data. An interface easy to integrate in an own application and open to everybody and any other application! Any customer specific interfaces available, if needed.

D3D-Tube functions

measurement:

- non-contact measuring with special Y-tube-probe
- exact non-contact measuring of the bending radii with the same probe
- defining and modifying knots with the measuring arm (acting as a 6D-mouse), unrestricted or on a given frame
- modifying knots regarding different conditions (on tube straight lines, inside or perpendicular to the bending plane)
- contact measuring with automatically performed cylinder bestfit
- single point measuring or scanning with choosable point density (up tp 700 points per second)
- tube gauge measuring
- automatical bestfit of separately measured tube sections, in different coordinate frames
- transforming into a new coordinate frame using the „leap-frog" method (measuring the same 3 reference points in old and new frame)
- measuring a workpiece reference frame based on different methods as used in metrology, tube alignement
- defining a master tube based on the measurement of a serie of tubes from which an average tube is statistically calculated
- defining tolerances, defining special probes, accuracy check on a master cylinder
-

construction:

- inserting/deleting knots/tubes, combining/dividing tubes
- aligning a tube automatically to the position and orientation of given in-/out- apertures
- possibility to define different radii and diameters possible
- possibility to define conical tube cylinders and conical bending torii
- constructing a tube either based on XYZ-values or on bending parameters
-

visualization:

- alternatively wireframe or rendered visualization, both in real-time
- marking tubes or part of tubes individually, swapping A- and B-end
- tube to tube bestfit, bestfit using tolerance cylinders
- showing knots and tube length, both online
- showing/modifying XYZ-values, showing/modifying bending-parameters, both online
- possibility to send a measuring protocol to an arbitrary „Windows"-window
-

special functions:

- defining bending machine parameters (option), checking bending process
- measuring tube flanges, measuring A- and B-position and A- and B-direction, measuring fixtures
- measuring and fitting obstacles, fitting curves
- constructing and inserting tube adapters (joining different diameters), defining A- and B-cones
- intersecting tubes with obstacle surfaces and calculating NC data for the 5-axis laser-cut based on the intersecting curve (option)
- Automatic calculation and construction of a spiral tube based on the incoming and outcoming cylinder and the number of turns
-

interfaces:

- import/export of XYZ-values („mm"/„inch") or bending parameters (=length/bending angle/turn angle)
- import/export of obstacle surfaces in CAD format

Delta 3D GmbH Gäwis 1303 CH-9633 Hemberg Switzerland http://www.delta-3d.com info@delta-3d.com Tel: +41 (0)71 377 17 17 / Fax: 10 30	**3900 €-system includes:** - „D3D-Tube-Basic" (with measurement functions) - Non-contact probe 70, 50, 30 or 10 mm