**Press Facts**

Pipe sizing

**Premiere at TUBE 2020**

**Dango & Dienenthal: Laser technology facilitates pipe sizing**

A circumferential laser enables high-precision measurements of internal pipe contours.

**Siegen, Germany, January 27, 2020 At the upcoming TUBE trade fair, Dango & Dienenthal (D&D) is going to unveil its new laser-supported tool for high-precision sizing of pipes. The Pipe Sizer achieves its extraordinarily high precision level thanks to a laser triangulation sensor which measures the internal contour of the pipe simultaneously with the sizing process. Another benefit of the new tool is that it dramatically cuts the time needed for pipe sizing.**

The core element of the system is the expander. This unique component features six axially arranged expandable forming dies that cover the entire internal circumference of the pipe. Each die can be expanded separately by means of a hydraulic cylinder. As each cylinder can be individually actuated, it is possible to size the pipe ends highly precisely and efficiently by actuating only those dies relevant for the sectors of the pipe circumference that need sizing.

Unique about this pipe sizing tool developed by D&D is that it comes with a 360° circumference laser which measures the internal contour over the pipe’s complete circumference, generating - in real time - an exact high-resolution image of the internal pipe wall.

### High-precision input for high-precision control

The pipe to be sized is fed onto the pipe sizer by means of a roller table. During this process, the 360° circumference laser measures all geometry data needed for the subsequent sizing process. From these measurements, the dedicated software calculates the actuation values for each one of the six expandable dies.

During the sizing process, the dies are individually expanded exactly to the point and with the pressure needed to achieve the desired internal contour of the pipe. When the process has been completed, the laser re-measures the contour. In the event that the pipe wall has sprung back, the control software re-calculates the actuation values for a second sizing cycle and the sizing process starts anew.

Each one of the six dies covers a sector of 60°. It may happen that the contour measurements show that the pipe wall needs to be expanded at a point located between two adjacent dies. In this case, the pipe can be rotated on the roller table.

The first pipe sizing machine of this type designed by D&D will be used for sizing the ends of pipes with diameters ranging between 400 and 1,000 mm and wall thicknesses between 20 and 60 mm.

Denis Albayrak, Sales Manager at Dango & Dienenthal Umformtechnik, describes the benefits for producers and processors of tubes and pipes: “The inline laser measurement makes it possible, for the first time ever, not only to obtain information about the internal geometry of a pipe “live”, during the sizing process, but to actually use this information inline for the control of the sizing operation in process. This shortens the entire procedure while achieving ultra-high precision.“

### Best Fit and full body expansion

With the contour measurement by a laser it is now possible to introduce 100% pipe inspection without having to set up a time-consuming procedure. Gapless documentation of the geometry – inside diameter and ovality, for example – no longer poses a challenge. This data can even be used to apply the Best Fit process, a highly efficient process to optimize line pipe welding assembly operations.

Moreover, the new laser-based sizing technology also enables the sizing of pipes along their full body. The demands on the quality of pipes - especially, in terms of perfect roundness - have become increasingly exacting during the last few years, presenting pipe manufacturers constantly with new challenges. Here the new laser-supported tool has the potential to accelerate the pipe sizing process perceptibly and reduce the number of out-of-spec pipes shipped.

**600 words**

### Background information: Circular laser triangulation

The recently patented 360° circumference laser measures the internal contour of seamless and longitudinally welded pipes in a non-contact process based on the circular laser triangulation technique. It captures the internal contour along the complete pipe length, immediately generating a complete 2D image of the internal pipe wall from the measured data.

This innovative measuring system, arranged at the head end of the Pipe Sizer operates on the laser triangulation principle. A laser, accommodated in the measuring head, projects a line onto the complete internal circumference of the pipe. The measuring head also contains a camera which captures the projected line at 2,048 pixels arranged around the internal pipe circumference, equaling an angular resolution of 0.17 degrees. By calculating the individual distances from the axis, the software generates an exact image of the internal contour of the pipe.

The resolution of the distance measurements equals 0.1 percent of the measured area: in a pipe of 500 mm radius, for example, the resolution would be 0.5 mm.

**Background information: 166 words**

**D&D at TUBE 2020  
Düsseldorf, Germany, 30 March - 3 April 2020:**

**Hall 5, stand C24**

### About Dango & Dienenthal Umformtechnik GmbH

Dango & Dienenthal Umformtechnik GmbH designs and manufactures machinery for plate cold and hot bending and for hot forming of pipe by induction bending.

The company’s product range includes heavy-duty plate roll-bending machines, three and four-roll round bending machines and induction pipe-bending machines.

Dango & Dienenthal provides a full line of services, from the design and planning through to the manufacturing, installation and commissioning of complete machines and plants, and after-sales service.

Added to this are upgrades and the service of hydraulic and hydroforming presses, and the relocation of presses, including dismantling and reassembly work.

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Figures and captions:

High-resolution image files are available for downloading at:   
[press photos](https://www.vip-kommunikation.de/dango-dienenthal.html)

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| Fig. 1: A camera captures the line projected onto the internal pipe wall by the 360° circumference laser arranged on the head end of the Pipe Sizer.  Dateiname: D&D-Pipe-Sizer.jpg |  |
| Fig. 2: The tube lies on the roller table and can be turned if necessary.  File name: D&D 04919023\_Rollgang+PST\_002.jpg |  |
| Fig. 3: The pin-type 360° circumference sensor (left) is arranged at the head end of the sizer.  File name: D&D\_04919023\_Rollgang+PST\_005.jpg |  |
| Fig. 4a: The expandable forming dies in the retracted position.  File name: D&D\_04919023\_Rollgang+PST\_003.jpg |  |
| Fig. 4b: Each of the six expandable forming dies is separately actuated by a hydraulic cylinder.  File name: D&D\_04919023\_Rollgang+PST\_004.jpg |  |

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