

Automatic Tube Production with varying shapes and diameters - with tool change and with integrated tube cutter -

It was at the **Blechexpo** in Stuttgart 2 years ago when we introduced this world novelty first fully automated tube roll forming and welding line with Laser or TIG source. We also integrated our 3D tube cutter TOP 600. Three of these lines are now working successfully in the industry. The advantages of this line are:



- Higher flexibility
- Tube production between 70 and 500 mm possible
- Wall thickness between 0.3

and 2 mm with different materials can be produced

- Different geometries such as round, oval, conical, square and Trapezoids can be produced.
- Starting material from coil or precut blanks possible.
- Multiple tube production per



Destacker and roll former



machine cycle if required (min. length 250 mm).

- No scrap and low inventory cost due to just-in-time production.

Stainless steel, carbon steel, galvanized and galvanealed, aluminum and aluminized steel as well as copper can be processed.

- control cabinet and cooling

system on balcony above the line saves space.

- weld seam annealing integrated in tube exit area possible if required



2-Roller Roll forming technology – no tool change –varying tube geometries and diameter produced with CNC technology



Due to TTE patented Flexformer Technology it is possible to CNC roll form tubes between 75 and 500 mm diameter with only 2 rollers. Pre-programmed products of different size and shape can be roll formed in any required sequence without tool change or set up. Multiple blank pick and place stations provide the required sheet for this process. The 2-roller technology guarantees that there is no flat area around the weld seam. The

machine can be supplied as a standalone roll forming cell (manual or automatic blank feeding from up to 4 sheet stacks). The finished roll formed tubing will automatically unload and fed to an exit chute. More than 30 machines are already working world wide. Visit TTE or customer sites to see it yourself!



TT2 – CNC roll former cell

New at TTE

Manually loaded - tube welding machine 2

Fully automated tube production line CS 2

Optimal use of laser 2

Tube end forming, flanging, beading, etc 3

Stainless steel tubing for exhaust systems 3

3D tube cutting with TTE TOP 600 3

What's new at TTE 4

- Innovative solutions for tube production and processing.

- Complete turnkey solutions for chimney and HVAC industry.

- Flexible tube production lines for tubes and shells for the car/truck exhaust industry.

- We personally support your project development

- We develop and build complete factory solutions and automation

SLU 500 - Tube welding without tool change with manual loading and unloading!



Tube welding machine:

- 75-500 mm diameter
- 0.3-2 mm wall thickness
- 1000/1250 and 1550 mm standard tube length.

Loading of the roll formed tube is done manually by pushing the tube onto the weld rail system. The machine positions, clamps and welds the tube automatically and then releases the tube for manual unloading.

Machine delivered as

- **STU 500** with TIG
- **SPU 500** with Plasma
- **SLU 500** with Laser.



Modern touch panel technology with Siemens S7 control!

“Flexible tube production at a reasonable price supports entering the market to manufacture tubes in-house. Regional production centers can now be set up in multiple locations”



Multiple tube production per machine cycle.



Two CSL double lines in production in the USA (Simpson Duravent)

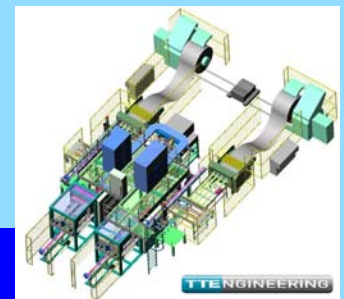
Die neue TTE halbautomatische

Fully Automated tube production - CS Line

We have supplied many fully automated tube production lines during recent years. The **CS** line starts either from sheet (single or dual de-stacking table) or from coil with integrated cut to length line with or without sheet stacking/destacking. The sheets are then exactly fed into the roll former (perfectly square sheet position – no double sheet problems). The weld seam position is controlled all the way through the line until tube discharge. Roll

formed tubes enter an intermediate buffer are then released separately to the welding station. The finished tube is transferred to the exit chute area (left and right side discharge possible) where annealing can be integrated. The CS line can be supplied as Plasma/TIG or Laser welding source. TTE has constantly improved the process and the product quality as well as cycle time (reduced significantly) over the years

Double production line using one Laser with a beam splitting technology!
Laser is used more than 95% of the time.



Optimal usage of laser...

is achieved with TTE's double line **CS**. Depending on production volumes a single line can be converted to a double line or one can start with a double line. Two CS lines are positioned parallel to each other. The Laser beam is delivered either with a beam switcher or via fiber optic cable to each welding station. While one line is welding the other line is finishing its idle operations (transfer, clamping etc.). The relatively expensive laser is now

almost used 95% of the cycle time instead of below 50% usage. Different tube sizes, materials or geometries can be produced on each CS line. High productivity is matched with high flexibility to lower your piece price of the products.

Laser welding speeds have been perfected to 15-20 m / minute TIG welding speeds are now at 5-6 m / minute or more.



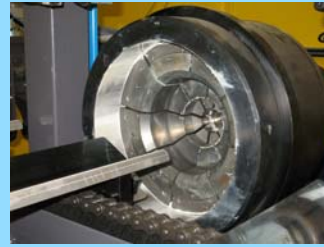


Automatic Tube end forming line

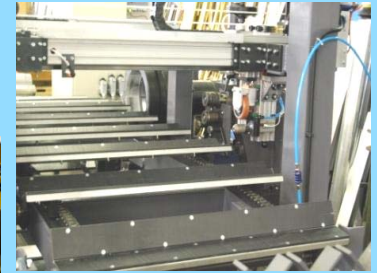
The quality of our weld seam allows extreme forming of tube ends. Single process end formers as well as fully automated tube end forming lines combined processes such as roll flanging, beading, expansion and reduction. Despite extreme forming the weld seam is not cracking.



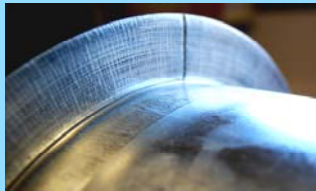
automated production plants for the heating, ventilation and chimney business.



female forming and reduction.



TTE tube end forming with beading, flanging, expansion and reduction and automatic transfer



TTE is offering completely

Here you see photos of the automated end-forming line with self-centering transfer system, including double sided male-



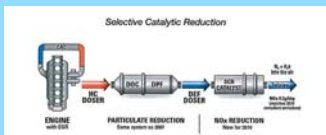
“Considering the entire process chain as a whole, productivity and quality will be optimized...”

Shells for Truck exhaust shells USA

Eberspaecher is producing stainless steel shells for the converter and particle filter assemblies for Freightliner and Volvo Trucks for the EPA 2010 exhaust systems.

The 1.2—1.5 mm thick stainless steel shells have different diameter and lengths depending on product design and filter sizes

used (100-350 mm thickness and 90-950 mm lengths) ENA will now extend the line with a TTE 3 D cutter TOP600 to cut holes for valves and other features into the shells. They will also produce more standard length tubing and cut the shorter tubes outside of the CSL line in order to increase capacity and quality. Another example of the advantages of combining processes to improve productivity and quality.



TTE specializes in engineering and the delivery of integrated solutions.

TTE Vision and Passion guarantees constant improvement and innovation“

3D - Tube cutter - TOP 600

Often the production process requires cutting short pieces for different components such as



elbow and t-sections, damper parts and more in the HVAC and chimney business. Furthermore small holes or miters need to be cut as well. This is done on the TTE 3-D cutter TOP 600 delivered as a free standing or fully integrated machine using robots or gantry systems. The machine is supplied with Plasma or Laser cutting technology. TTE's developed software allows precise manipulation of the tubes during cutting



Fully integrated TOP 600



Products made on TTE equipment for the global chimney and HVAC industry!



Automatic assembly solutions

TTEENGINEERING

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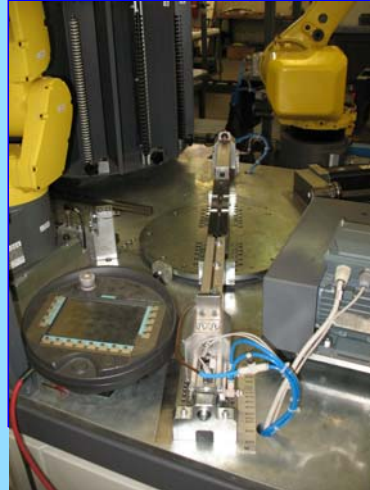
TTE specializes in automation of assembly processes. These photos show the automatic assembly of dampers for the HVAC industry.

Leader in tube production and automation technology

On the net at:
www.ttengineering.it



Robot pick and place of components



Fully automatic elbow production


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Stainless tube with TIG weld



Welded aluminum tube



TTE assembly hall view

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