



Powerful: the pipe bending mill in Mülheim



Fotos: PHOTOBJAHRE

Teamwork is the secret to success (from the left): Stephan Puschwadt, Joern Hoppe, Frederik Schröter, Elke Muthmann, Frank Lingnau, Mareike Kirch and Hans-Joachim Völkel

TAP teamwork

From HKM in Duisburg to the pipe bending mill in Mülheim – everyone is working together to deliver the TAP project

The pipe bending mill in Mülheim is working flat out. Since November 2, 2015, around 50 employees have been working around the clock on the largest order in the 30-year history of the company: 1,559 pipe bends are required for the construction of the Trans Adriatic Pipeline (TAP). The production of these pipes bends ensures capacity utilization at the plant until the start of 2017.

According to Elke Muthmann, Head of Operations at the pipe bending mill, one reason was certainly decisive in gaining the order: “We were able to offer a group solution. This not only means that the products fit together, coordination is also much smoother. And the customer really appreciates this, particularly given the ambitious timeframe.” In addition to Hüttenwerke Krupp Mannesmann in Duisburg* (HKM), Salzgitter Mannesmann Grobblech, EUROPIPE **, the pipe bending mill and Salzgitter Mannesmann International (SMID) are also involved in the TAP order.

Frederik Schröter, Works Manager at the pipe bending mill, explains the production workflow:

“Steel in the grade L485 is produced at HKM and cast into slabs. Salzgitter Mannesmann Grobblech in Mülheim rolls these slabs into plate, which serves as pre-material for longitudinal welded large-diameter pipes at EUROPIPE. These pipes are then finally bent into various angles by us using induction.”

The pipe bend hollows for the TAP order require wall thicknesses of between 21 and 36 mm. That is more than in normal line pipes, as the bending process causes compression and stretching in the pipe body and the minimum wall thickness may not be undercut. Most pipe bends are delivered with an outer-diameter of 48” (1,219 mm), while just 43 bends which are required for the Italian mainland section of the pipeline have a nominal diameter of 36” (871 mm).

After the production of the bends, a so-called tempering treatment takes place, which is required to achieve the right material-specific mechanical properties. The only process remaining is then the end machining of the pipes, which are finally coated on the inside with epoxy flowcoat and polyurethane on the exterior.



FOTOS: PHOTOBÜRO JAHR/DE

The pipes are shaped by way of induction bending at the pipe bending mill – completed in a wide range of angles

The pipe bends weigh between 1,680 and 8,050 kg, and between eight and twelve bends are produced each day. A HGV then transports the pipe bends to the port in Brake, where they are shipped to the Adriatic. Stephan Puschwadt, Head of the Pipe Department at Salzgitter Mannesmann International, explains: “We are currently still storing the pipe bends at the port. The first ship carrying the bends is due to depart on April 19 and then the rest will be transported in quick succession after that. The destination ports are Durres in Albania as well as Thessaloniki and Kavala in Greece.”

SMID played an important role in gaining the record order and is responsible for the contract arrangement, the entire project management, documentation and the logistics execution. Negotiations included SMID’s Hans-Joachim Völkel as Project Manager and Maria Mougousidou, responsible for the entire project delivery, as well as pipe bending mill representatives Elke Muthmann and Joern Hoppe as project supervisors for the TAP order within the pipe bending mill’s sales team. “The timescale was really tight,” recalls Hoppe. “We received the inquiry on March 3, 2015. We then had three meetings in four months before signing the contract on September 24. We already shaped the first pipe in our mill on November 2.” And not only the team in Mülheim is delighted to have a busy workload and capacity utilization ensured for the remainder of the year.

* SZAG has a 30 % stake in Hüttenwerke Krupp Mannesmann via Mannesmannröhren-Werke (MRW). ** Salzgitter holds 50 % of the shares in EUROPIPE

Induction bending

Bending pipes using inductive heating is an advanced technique with a largely automated, continuous shaping process as part of which the pipe is bent within a small section heated by a ring-shaped inductor. The bending force exerted on the pipe is axial, and the front end of the pipe is clamped to a bending arm. The bending arm traces a circular arc around its pivots according to the set bending radius. Under feeding force, the pipe is pushed through the mechanism at the pre-set radius.

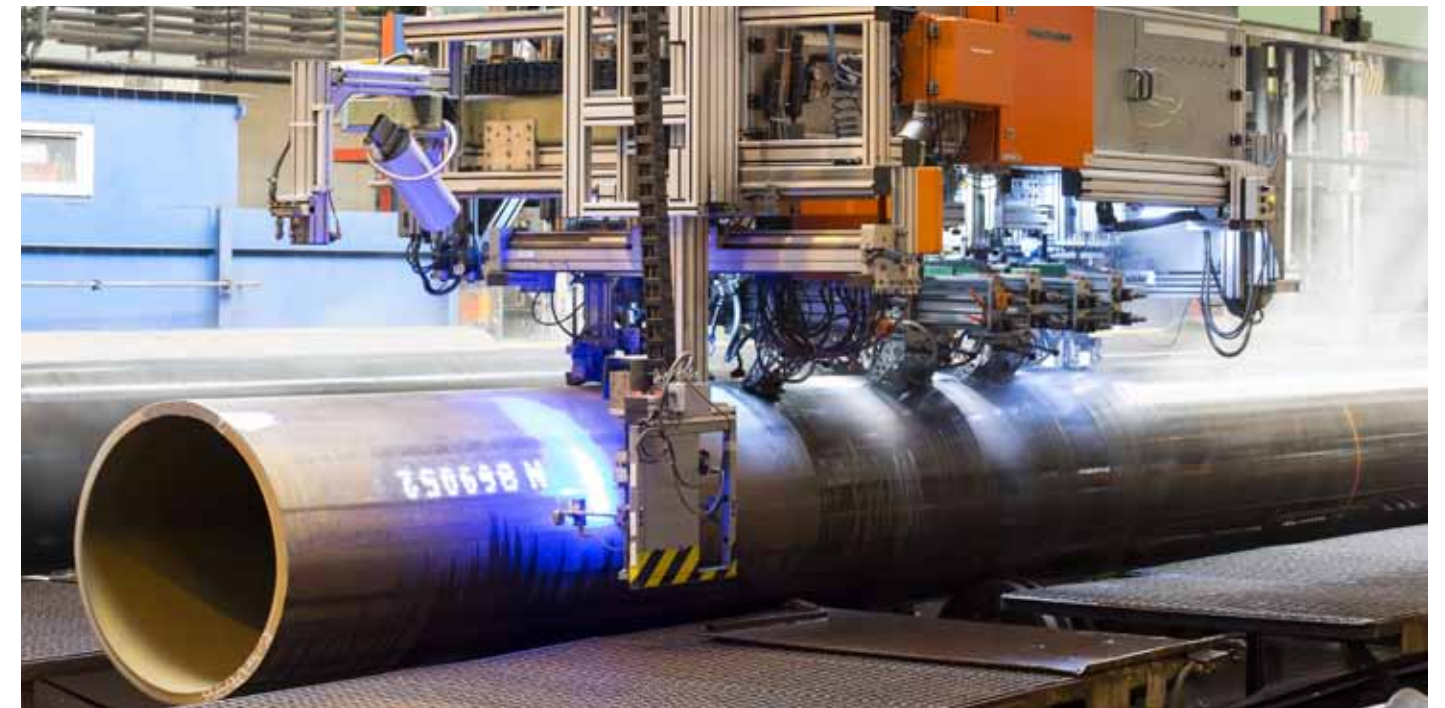
In Mülheim, the shaping of steel pipes with induction bending is executed by one of the most high-performance pipe bending machines in the world. The bending process is carried out with partial inductive heating and precisely controlled temperature management. The system is fitted with two bending arms which correspond with the different specifications required for the final products.

The powerful design of the bending machine allows the production of pipe bends with tight bend radii as well as large pipe diameters and wall thicknesses. This process is effective for both ferritic and austenitic materials in equal measure.

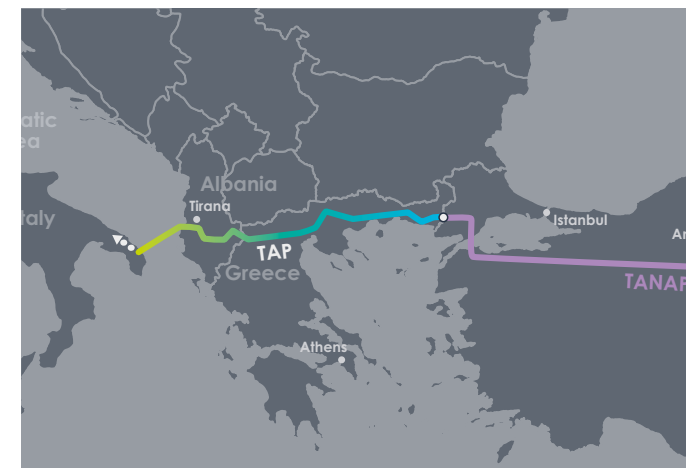
Even extremely large bending radii up to several hundred meters can be realized. The capabilities of the Mülheim induction-bending machine create additional scope for special solutions such as the bending of forged components.



Mareike Kirch is a plant engineer in our heavy plate mill located in Mülheim. This is where the slabs cast by Hüttenwerke Krupp Mannesmann in Duisburg are rolled



Large-diameter pipe production at EUROPIPE



The Trans Adriatic Pipeline (shown in turquoise and light green on the map) is due to transport gas from the Caspian region after its completion in 2020 – in connection with the TANAP pipeline which is already under construction (purple)



Each end of a pipe bend is machined and supplied with a welded bevel. The geometry has to be just right to avoid any problems on the building site in circumferentially welding the pipe bends with the line pipes