

# LINE PIPE GLOBAL

[www.magazine.mannesmann-linepipe.com](http://www.magazine.mannesmann-linepipe.com)



**MANNESMANN**  
**LINE PIPE**

A Member of the Salzgitter Group

Issue 12 · April 2019

Transport, logistics, mobility

## We make a difference

**Also available  
online!**

[magazine.mannesmann-linepipe.com](http://magazine.mannesmann-linepipe.com)



**Germany**  
Reconstruction of  
Schiersteiner Bridge  
Page 12

**Great Britain**  
Waste Disposal  
Wembley Park  
Page 16

**Poland**  
New construction of  
Katowice bus station  
Page 20



Dear Reader:

The new issue of Line Pipe Global focuses on transport, logistics and mobility.

Under the motto "We make a difference", we don't want to look at the well-known aspects of applications in the classic line pipe sector, but rather present exciting projects in which our products have been used. From the leading role in a bridge construction project to a new bus station as part of a sustainable transport concept, and from there to innovative waste disposal.

In addition, we look to the future and give you an outline of the application area of transport and hydrogen storage.

"We make a difference" also stands for the logistics services we provide to our customers and shows how we ourselves depend on the transport of our goods.

For example, you can find out on which route our pipes reach the USA. A figure that may surprise many of you in this context: For the transport of our HFI-welded pipes, we continuously have 90 special wagons of Deutsche Bahn in service. Not only a reliable, but also a very sustainable transport alternative, as has been recently confirmed by DB Cargo. In 2018, rail transports have enabled us to reduce our CO<sub>2</sub> emissions by 2,080 tons to 825 tons compared to road transport by truck.\* Here, too, we make a difference!

On the following pages of this issue you can read about the opportunities Mannesmann Line Pipe products open up for our customers in the fields of transport, logistics and mobility, both now and in the future.

**I wish you a stimulating and enjoyable read!**

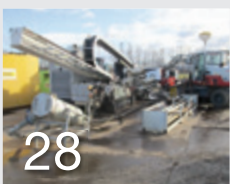
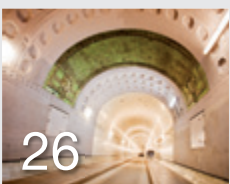
Jörg Winkels  
Director Technology and Sales



\*Calculated with EcoTransIT World according to DIN EN 16258, Annex D Level 4 of DB Cargo.



## Contents



### Cover story

- 04 Transport, logistics, mobility
- 06 Mobility - Getting the curve into the future
- 08 Interview – "From A to B was yesterday. Today, the whole alphabet is involved."
- 10 Farewell pipe!

### Projects

- 12 Reconstruction of Schiersteiner Bridge
- 16 Waste Disposal Wembley Park
- 20 New construction of Katowice bus station
- 22 Sea Tank Terminal Antwerp
- 26 Elbtunnel St. Pauli-Renovation, Hamburg
- 28 Natural gas high-pressure pipeline in Lower Austria

### On the go

- 30 Snapshots from all over the world



Photo: © iStockphoto.com

Transport, logistics, mobility

## We make a difference



**Mobility, transport and logistics play an important role in the globalized economy. That oil, gas and water are transported via pipelines is a well-known fact. The focus of this issue is the extent to which products from Mannesmann Line Pipe assist in the flow of goods, transportation, and the plans for the metropolises of the future.**

Without regular local supplies of electricity, natural gas, oil, water and fuels through pipeline networks, practically nothing would work in the municipalities, in the economy and in private households. Mobility and transport are inconceivable without reliable energy supplies.

### **Pipelines against unending traffic jams**

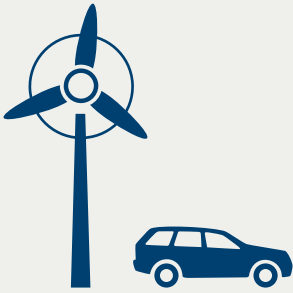
The mostly invisible transportation of energy facilitates mobility in two ways: If our daily demand for energy carriers were met exclusively via road, rail, or waterway transport, we would be faced with unending traffic jams and high transport risks every day. Fuel supplies via pipelines not only take the load away from traffic routes and make them safer – in fact, it is thanks to them that this traffic is possible at all in the form we know today.

### **We move much more**

But our contribution towards mobility is not limited to pipes for pipelines. Products from Mannesmann Line Pipe can be found in bridges, distribute kerosene in airports, serve as extinguishing water pipes in railway tunnels, or they have been used, for instance, in the passages of the St. Pauli Elbe Tunnel, which has eased the commuter traffic load on the Port of Hamburg for over 100 years now.

### **Part of tomorrow's mobility**

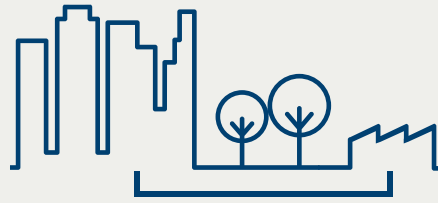
Power-to-gas, large-scale hydrogen use, or intelligent waste disposal concepts for conurbations are just a few of the many other topics that we report about in this issue.



## Getting the curve into the future

How renewable electricity can contribute to CO<sub>2</sub>-neutral mobility. An outlook.

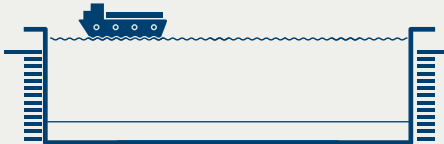
[Page 6](#)



## Down the pipe! Waste disposal 2.0

In London's Wembley Park district, waste is extracted through an underground pneumatic pipe system.

[Page 16](#)



## Clever and simply ingenious. Old Elbe tunnel rehabilitated with "Fuchsrohr System"

The rehabilitation of the two tunnel tubes in the St. Pauli-Elbtunnel was started in 2010. With pipes from Mannesmann Line Pipe.

[Page 26](#)



## "Katowice 2030"

As part of the urban development concept, the new bus station will become an important traffic junction.

[Page 20](#)



## Interview

"From A to B was yesterday" - Thomas Bardzik explains the complex logistics services provided by Mannesmann Line Pipe.

[Page 8](#)



## A ship is bound to come...

It's a long way to the "States". Read how our pipes get there.

[Page 10](#)



## New bridge over the Rhine

The reconstruction of the Schiersteiner Bridge between Mainz and Wiesbaden is making progress. We visited the site.

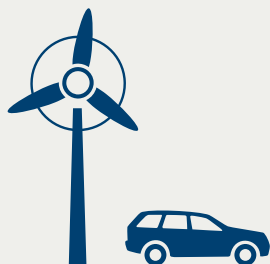
[Page 12](#)





Cover story: We make a difference

## Mobility - Getting the curve into the future



The storage of surplus electrical energy generated from renewable sources plays an important role in the context of the energy turnaround. The more electricity we generate from renewable energies, the greater the possibility of a CO<sub>2</sub>-neutral use of hydrogen and methanized natural gas. An outlook.

### Hydrogen for industry

Hydrogen consumption in Germany is enormous. About 20 billion standard cubic meters are produced annually in this country, and worldwide even 500 billion. Usually hydrogen is produced by steam reforming with natural gas. However, this process releases enormous amounts of carbon dioxide. About 10 tons of CO<sub>2</sub> are emitted for the production of a single ton of hydrogen. Among the largest industrial users are refineries that need hydrogen to desulfurize petrol and diesel. If renewable energies could be used here for electrolysis, this production would be almost CO<sub>2</sub> emission-free, with positive effects on

the CO<sub>2</sub> balance of conventional fuels. In addition to applications in other chemical sectors, such as drug and fertilizer production, there is a vast potential for the use of green hydrogen or synthetic fuels produced with the aid of green hydrogen in the mobility sector: in inland waterway and maritime transport, in air traffic, as well as in truck and rail traffic.

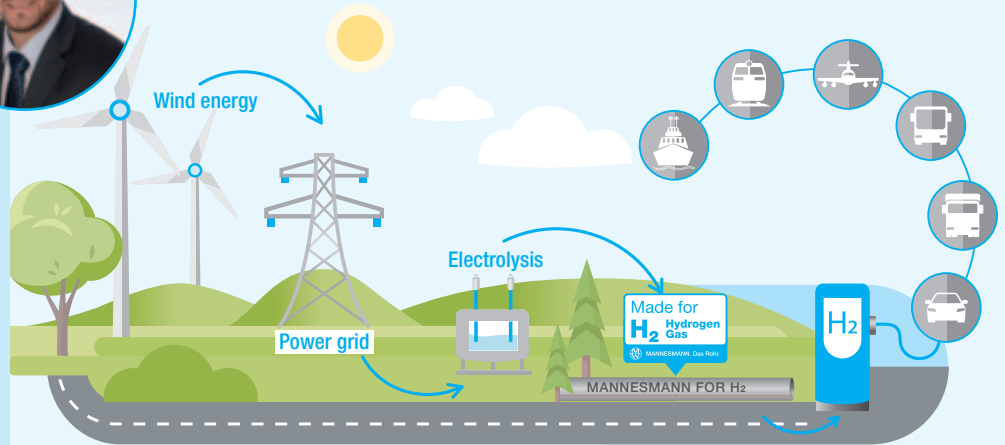
### Power-to-fuel

On behalf of Audi AG, in 2013, ETOGAS GmbH erected a 6 MW pilot plant for the conversion of excess green electricity into renewable natural gas in Werlte, Lower Saxony. Besides hydrogen



**The future with hydrogen can come - we are well prepared!**

**Manuel Simm,  
Regional Sales Manager**



from regenerative sources, CO<sub>2</sub> from an existing biogas treatment plant in Werlte is also used for methanization. The new plant thus produces renewable fuel, called "e-gas" by Audi. The consumption of the Audi g-tron models' vehicle fleet is precisely documented and fed 1:1 into the natural gas grid, so it can actually be termed climate-neutral fuel consumption.

#### **Power-to-gas**

Power-to-gas technology converts regeneratively produced electricity into chemical energy in the form of various gases. Water is first split into hydrogen and oxygen by electrolysis and then CO<sub>2</sub>-methanized. The result is synthetic natural gas. As a matter of interest: Germany has a nationwide infrastructure of over 400,000 km of natural gas pipeline network and over 50 underground natural gas pipe arrays with a current capacity of 23.5 billion standard cubic meters. This could be used for transporting and storing synthetic natural gas. The technological development for the production of green hydrogen using the power-to-gas process is about to establish itself on a large scale. The network operators Tennet, Gasunie and Thyssengas want to promote the storage of renewable energies in gas networks and build a 100 MW plant in northwest Germany. Two locations close to Tennet transformer stations, which mainly bundle and

distribute offshore wind power from the North Sea, are possible candidates. The pilot plant is to start in 2022 with a first module, after which a new module will be added every other year until 2028.

#### **Mannesmann pipes for hydrogen transport and storage**

Mannesmann Line Pipe can offer its customers suitable products and solutions for the transport and storage of hydrogen. The requirements of EIGA, the European Industrial Gases Association, are generally not a problem. Manuel Simm, responsible Regional Sales Manager at Mannesmann Line Pipe: "For durable resistance to the conditions of hydrogen transport, the inside surface of our pipes is free from weld upsets in accordance with ISO 3183. Potential points of attack in the material itself are limited to a minimum, because the phosphorus and sulphur contents are even lower than specified in the EIGA guideline." And Manuel Simm adds: "The pipe material's carbon equivalent has also been reduced, which provides for excellent weldability. The result: low-maintenance operation of the pipe system for a long service life."

#### **H<sub>2</sub>-pipes – the next step**

In order to raise the economic efficiency of hydrogen transport and storage, higher-strength pipe materials and smaller wall thicknesses suggest themselves as possible options. To assess the effects

of hydrogen on such higher-strength materials, investigations were carried out together with Salzgitter Mannesmann Forschung GmbH on grade X70 steel (according to API 5L). Round tensile test specimens of the base material and HFI welds were subjected to slow strain-rate tensile tests in an atmosphere of 80 bar hydrogen and 80 bar nitrogen. Manuel Simm explains the results: "Neither in the base material nor in the HFI weld specimen did we observe any relevant influence of the hydrogen on the course of the stress-strain curves, the yield strength or the tensile strength and thus on the strength of the material as a whole. This means that we have also qualified higher grades for use as hydrogen line pipes." His final conclusion: "The future with hydrogen can come - we are well prepared!"

[www.mannesmann-innovations.com](http://www.mannesmann-innovations.com)



For further information on the topic of hydrogen as well as the contact details of Manuel Simm, please visit our new website [www.mannesmann-innovations.com](http://www.mannesmann-innovations.com)

Interview

"From A to B was yesterday.  
Today, the whole alphabet is involved."



In order for products from Mannesmann Line Pipe to contribute to mobility, they must be set in motion themselves. A sometimes very complex topic, according to Thomas Bardzik in Siegen.



**What transport and logistics services does Mannesmann Line Pipe provide for its customers?**

**Thomas Bardzik:** We calculate, organize and carry out a wide variety of transports for our customers. Sometimes to customer specifications, sometimes we develop the optimal transport solution ourselves to destinations all over the world. From a single pipe up to a maximum weight of 25,000 tons, which fit on an ocean-going vessel. All this, of course, in coordination with production, further processing, such as internal or external coating, and intermediate storage.

**Which means of transport are used?**

We transport by truck and rail as well as by ocean-going vessel, both conventionally and in containers. Our plants each have their own sidings, which is particularly advantageous in the case of large quantities. Frequently, however, combined transports are also involved.

**What role does logistics performance play in the context of order placement by customers?**

The supply and logistics chain is increasingly gaining importance in the overall

package of project management. Experience and reliability play the central role and are our decisive edge when it comes to differentiating ourselves from our competitors. On the one hand, there is enormous cost savings potential; on the other hand, we can minimize the risk of transport damage by choosing experienced partners or working out the best possible transport and storage conditions. In the case of large orders, this leads to extensive consulting services. The quality of logistics services can ultimately determine the success or failure of a project for the client.

**How have customer requirements changed in recent years and how has Mannesmann Line Pipe adapted to the changes?**

Fewer and fewer customers have their own logistics department and warehousing. We were able to compensate for this bit by bit. Over time we have formed a whole team of logistics specialists. Experienced people who have dealt with the requirements of different markets and customers and have very detailed knowledge. Just getting a delivery from A to B was yesterday, today the whole alphabet is involved.





*The quality of logistics services can ultimately determine the success or failure of a project for the client.*

Thomas Bardzik



**Thomas Bardzik,**  
**Logistics Purchasing**

After training as an office clerk at a family-run steel processing company, Thomas Bardzik found his way to Mannesmann Line Pipe in 2009. In logistics, he has since been mainly responsible for handling partial and full loads for delivery within Germany. After changing over to freight purchasing in 2017, he has organized transport solutions for Mannesmann Line Pipe by road, rail and sea.

#### **What does that mean exactly?**

For example, to reconcile the most diverse customer wishes with the numerous regulations to be considered both nationally and internationally. From checking that forwarders meet our requirement profile, the provision of unloading cranes in storage areas, verification of compliance with load securing requirements according to our Dekra certification, consideration of environmental management requirements through to customs clearance. In addition, there are always country-specific peculiarities, e.g. concerning truck drivers or freight forwarders.

#### **The right partners play an important role. What does the cooperation look like in concrete terms?**

If, for example, we supply pipes for a pipeline to the south of France, it must be planned in advance and examined whether the storage areas are large enough and suitable as such according to our specifications. What do the access roads look like, how and at what times can the pipes be delivered and unloaded to our specifications as well as properly stored. Or when it comes to the supervision of overseas deliveries, you need partners you can rely on one hundred percent. Over time, we

have set up a reliable network for our customers. Of course, we mutually benefit from our many years of experience, some of which we have gained together. However, we still accompany our transports ourselves or are on site to receive deliveries.

#### **What else needs to be considered?**

Quite frequently, we are dealing with combined transports. For example from Hamm or Siegen by truck or train to Bremen or Antwerp, and from there by ship to the overseas destination. Of course, everything has to be planned precisely and meticulously - when the goods arrive where, who receives them where and how they are temporarily stored, who documents that nothing has been damaged during loading or unloading. Who oversees the customs procedures, what is the unloading situation on site at the port of destination, and what are the next steps from there to the construction site? All this has to be sorted out before the pipes leave our plants.

#### **That probably doesn't always go smoothly, does it?**

By and large, it does. However, the supply chain is sometimes so long that we just cannot rule out that something

untoward happens to our freight. Above all, handling operations, such as unloading from the train and loading aboard a ship, or stacking in narrow storage areas always involve a certain risk of damage to our pipes or the coating. We are of course prepared for this and, in case of emergency, we can provide specially trained staff at short notice to carry out repairs in line with our quality standards.

#### **Where do you see the greatest challenges for the future?**

One aspect is certainly the shortage of personnel and skilled staff - from truck and locomotive drivers to port employees and surveyors.

The recording and calculation of CO<sub>2</sub> balances in relation to environmental compatibility is a very topical issue. Of course, we are dealing with the digitalization of production and logistic processes, and another focus will certainly be the preservation of the ability to react quickly in case of increasing weather extremes. Securing freight flows in the event of hurricanes, such as those in the USA, regional heavy rain phenomena or, most recently, the extremely low water level of the Rhine in 2018, gives rise to completely new challenges.



Transport, logistics, mobility

## Farewell, pipe!



**It's a long way to the "States". About 10,000 km – or a good 6,200 miles – from Hamm, North Rhine-Westphalia, to the Port of Houston, Texas. Let's accompany an HFI-welded steel pipe on its very varied journey there.**



Mannesmann Line Pipe has 90 special wagons in constant service for deliveries by rail.

At Mannesmann Line Pipe, the lead time from order placement through production to the shipment of an HFI-welded steel pipe is several weeks. The sales, purchasing, logistics and control departments are involved in the logistics process right from the start. Immediately after the order, the arrival date of our pipe in Houston, Texas, was notified to the International Shipping and Chartering Office (ISB) based in Bremen. ISB is Mannesmann Line Pipe's long-standing logistics partner for shipping goods to the USA.

in constant rotation for the Siegen and Hamm plants. Three times a week, a group of wagons or an entire train leaves the works with overseas deliveries.

Our pipe leaves Hamm some time during the evening. Between Oldenburg and Bremen, the freight train changes to the tracks of Bremen's port railway. Right in the morning, the pipes are unloaded and stacked by employees of the port operator. ISB had registered the goods in good time and arranged for the required intermediate storage areas to be kept free.

### **"Online dispatch" by rail**

After our HFI-welded steel pipe has passed the quality test, it is loaded "online", i.e. directly from production, onto a special Deutsche Bahn wagon. Mannesmann Line Pipe has 90 of these

### **A ship is bound to come**

Ours arrives at the port of Bremen at the end of January 2019. The loading space for our cargo was booked early by ISB. Now the port employees are loading all the goods destined to be shipped to the



USA. This is done strictly in accordance with the stowage and handling procedures to ensure on-board safety and prevent cargo damage. Our HFI-welded steel pipe and all others in this delivery are stowed in the subspace so that they are optimally secured against slipping and damage on the high seas.

#### All according to schedule

The shipping companies commissioned by ISB offer their customers two to four departure dates per month from Bremen to Houston. Strictly according to schedule, which is however updated or supplemented on a weekly basis. A challenge for all involved. Because transports, departure dates and travel time are subject to a certain temporal variance, which under unfavorable conditions can sometimes collide with the notified departure or delivery date. As a rule, dispatch to Houston takes about three weeks, depending on the weather or planned stopovers along the route.

#### Controlled export

As exporters with AEO status, the ports of Bremen and Brake are export ports recognized by customs. This facilitates exports for Mannesmann Line Pipe. The customs declaration must be made up to 48 hours before the ship arrives. How-

ever, Mannesmann Line Pipe can report any residual quantities up to 24 hours before loading. A Master Reference Number (MRN) is created for each order and transmitted to ISB. ISB, in turn, obtains customs clearance via access to the central information system of the port industry in Bremen and Bremerhaven and releases the goods for loading onto the ship. Based on the shipping and customs information, ISB prepares the accompanying documents, e.g. the bill of lading, and transmits the data to the shipping company.

#### Everything under control - thanks to AIS

Employees of Salzgitter Mannesmann International USA are on site in Houston for almost every pipe delivery from Mannesmann Line Pipe and inspect the goods for quality and completeness. AIS tracking, which enables the exchange of navigation and other ship data via radio system, allows the delivery to be tracked and precisely scheduled. Now it is loaded directly onto trucks and distributed. In the case of large deliveries, this requires enormous logistical fine-tuning with the ship's crew, port staff, local forwarding



At the port of Bremen: The pipes are loaded strictly in accordance with handling and stowage regulations.

Image: © ISB

agents and truck drivers.

On 18.02.2019 the time has come: after a night on the train, intermediate storage in the port of Bremen and just under three weeks on the high seas, our pipe arrives safely and in perfect condition in Houston, some 10,000 km away from Hamm. All papers have been duly stamped, acknowledged and handed over. Another Mannesmann pipe "Made in Germany", which has made the long journey to the "States" and is now waiting for its intended application.



### Three questions to Stefan Döring, Managing Director of Internationales Schifffahrts- und Befrachtungskontor GmbH (ISB), Bremen

**ISB is the logistics partner for Mannesmann Line Pipe for the reliable transport of goods by ship to the USA.**

#### Mr. Döring, what services does ISB provide to Mannesmann Line Pipe?

On the one hand we organize the handling involved at the port of Bremen, on the other we are the link to the shipping company: from the registration of the goods to be expected, through interim storage and then loading onto the ship. We clarify the basic shipping options and book freight spaces from very small to project quantities. In addition, we obtain customs clearances, handle all docu-

mentation and ensure that all deadlines are met.

#### How does the cooperation work?

The operative activities regarding interim storage in the ports and overseas shipping require close daily coordination between our staff teams and the Purchasing and Logistics department at Mannesmann Line Pipe. The mutually transparent flow of information is the basis for a long-standing successful partnership.

#### How has your industry changed in recent years?

The arrival of IT is, of course, unstoppable



**Conventional shipping still means a lot of manual work. The experience of the employees involved is invaluable.**

**Stefan Döring, ISB**

and processes are becoming ever faster. However, conventional shipping still means a lot of manual work. Therefore, direct communication from person to person and experience of the employees involved are invaluable.

**Many thanks for the interview!**



Project: Reconstruction of Schiersteiner Bridge

## A bridge for 100 years of mobility



Nowhere else can mobility, transport and logistics be experienced as clearly as in road traffic. After its reconstruction, the Schierstein motorway bridge in Rhineland-Palatinate is more stable, lighter and more cost-effective, thanks to the optimized design of its steel structure. The HFI-welded steel tubes used for this purpose were supplied by Mannesmann Line Pipe.

On 10 February 2015, at around 10 pm, considerable damage was detected in the Schiersteiner Bridge on motorway A 643. One pier of the more than 50-year-old foreland bridge had tilted, whereupon the carriageway was lowered by about 30 cm. The bridge was then closed immediately. On the day after, the importance of the bridge, as a part of the "Mainzer Ring" between

Hesse and Rhineland-Palatinate, made itself felt in rush-hour and interregional long-distance traffic: Tailbacks of several kilometers, diversion chaos through Mainz, Wiesbaden and the surrounding area not only strained the nerves of tens of thousands of commuters and truck drivers, but also those of the planners and road workers who had been working for two years now on one of



Image: © Hessen Mobil



The design is the most economical solution in terms of both maintenance and production costs.

From the jury's reasoning on the winning design

Germany's largest transport infrastructure projects.

#### **New construction project brings old bridge to its knees**

It was work on the piers for the new Schiersteiner Bridge that caused this incident. After a two-month full closure, the old bridge was initially re-opened with some restrictions, and then, in autumn 2015, to heavy traffic as well. All those affected and involved breathed a sigh of relief!

#### **A long way to the groundbreaking ceremony**

Planning for the "old" Wiesbaden-Schierstein Rhine Bridge started in 1955. At that time, a traffic volume of 7,100 vehicles per day was forecast, and the bridge was designed for a maximum 20,000. Today, up to 86,000 vehicles cross the Rhine at this point every day. No wonder, then, that the bridge has long been in need of rehabilitation.

A design contest for the construction of a new bridge was held in 2007. The winning entry by a consortium consisting of the engineering firm

Grontmij BGS and the architectural firm Ferdinand Heide designed a 1,285 m long box girder bridge. The construction project envisages the successive realization of the new bridge with two separate superstructures. The bridge sections are each 21.72 meters wide and designed for three carriageways and a hard shoulder as well as a cycle path and sidewalk. The ground-breaking ceremony for the new bridge was held on September 11, 2013.

#### **Bridge construction in three phases**

Originally, the plans were based on the assumption that the new bridge structure would be completed by 2019, but the lowering and closure of the existing bridge in February 2015 had completely disrupted the timetable. First of all, the old bridge had to be repaired and upgraded for current traffic requirements.

The new bridge is essentially divided into three construction phases. Phase one began in 2013 with the construction of the so-called downstream bridge in the direction of Mainz until late summer 2017. This included the foundation work



The limited use of the "old" Schiersteiner Bridge caused miles of traffic jams and great irritation among all those involved.

Image: © iStockphoto.com



Bernd Hollaender,  
Managing Director ProPipe and  
Guido Ludwig, Regional Sales  
Manager, Mannesmann Line Pipe

on the Wiesbaden side, the fabrication and assembly of the steel superstructures and the construction of the concrete superstructures. After completion of the remaining work, such as road surfacing and marking, erection of the gantry signs, installation of the drainage system and the supply lines, the first construction stage could be put into operation. Since November 20, 2017, traffic has been flowing in two lanes in both directions over the new bridge half. That accomplished, the second construction phase began with the demolition of the

existing bridge. For reasons of nature conservation and safety, the bridge was demolished and not blown up. Meantime, the project is in the middle of its third phase, with construction work on the bridge in the direction of Wiesbaden.

#### **Deliveries for both bridge halves**

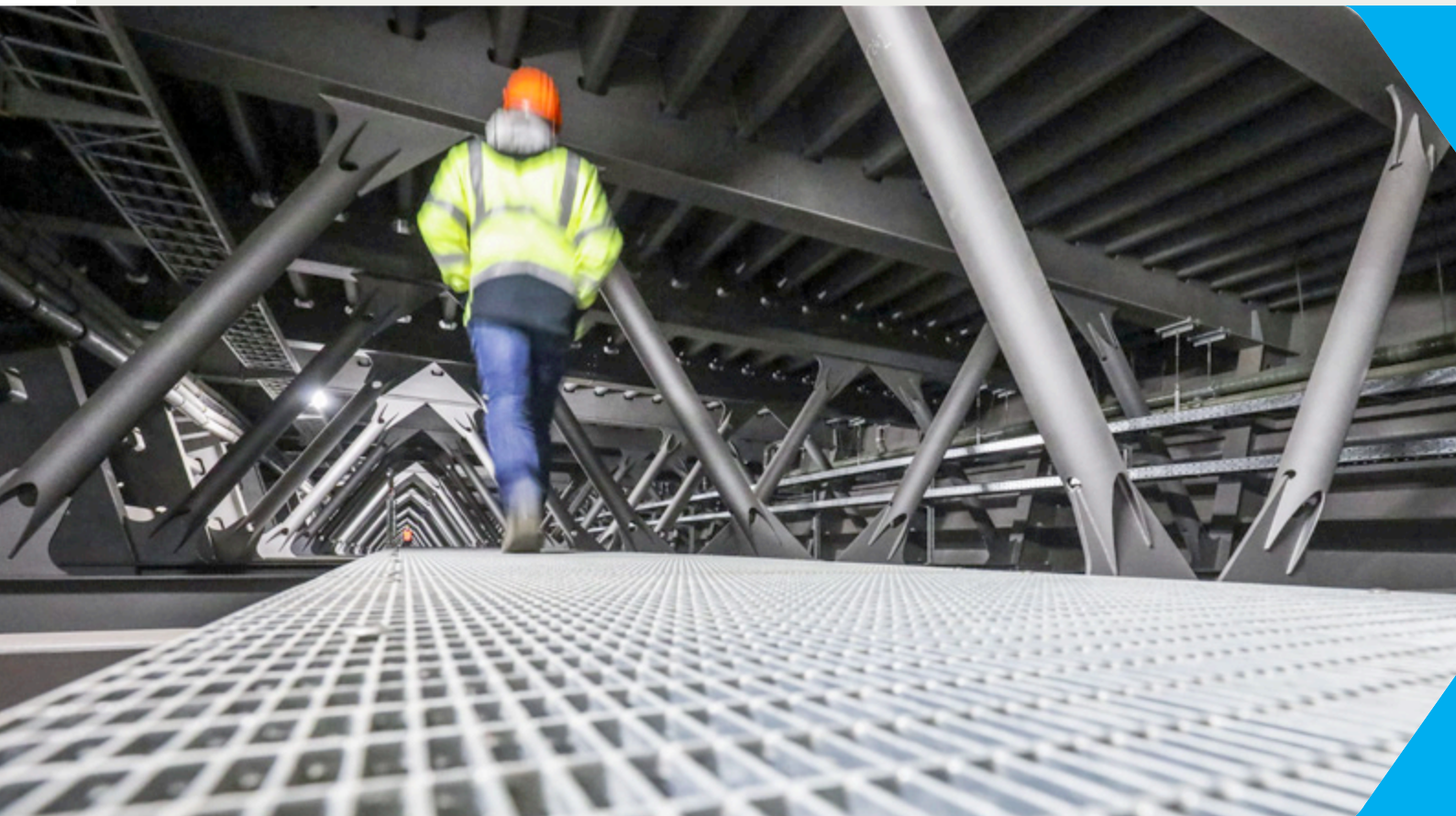
After successful deliveries for the first construction phase until 2017, Mannesmann Line Pipe once again delivered around 220 tons of HFI-welded tubes in grade S355J2H steel for the second half of the bridge. In accordance with

DIN EN 10210 and DB specifications, defined restrictions had to be met for the chemical analysis regarding the carbon, phosphorus, sulfur and boron contents. Furthermore, the test specifications had to be tightened in terms of the test temperature, which was lowered to -20°C. The tubes in size 244.5 x 10 and/or 12.5 mm were manufactured in Siegen and initially delivered to ZIS Industrietechnik in Saxony via the dealer ProPipe from Willich, North Rhine-Westphalia. There the tubes were flame-cut to specification, slit at the ends and beveled as a preparation for welding to structural components at the steel fabricators Max Bögl and Plauen Stahl. They were able to call off the tubes in line with their process flow. The finished components were then sent to the construction site where they were welded to the box girders as planned.

#### **Optimized design for greater stability**

The optimized design of the steel structure provided for significantly higher stability. In addition to immense savings

Image: © Lukas Görlach



## Detail with great effect

The optimized design achieved significantly higher stability in the steel structure. Oval cut-outs at the tube ends allow the inner strut structure to be welded to the box girder on both sides. This ensures force-locking joints and considerably higher stability in the entire bridge structure. According to the bridge experts at Hessen Mobil, the optimization allowed the wall thickness of the steel tubes to be reduced by almost 50 percent. This not only saves material and costs, but also ensures appreciably greater durability for the new bridge: At 100 years, its design life is twice that of its predecessor.



Image: © ZIS Industrietechnik GmbH

in material and costs, this will ensure a long service life for the new bridge. In fact, at 100 years, its design life is twice that of its predecessor.

### A very special on-site meeting

Anyone who always thought that one could only stand on or under a bridge would probably have been set right in September 2018: The bridge experts from "Hessen Mobil" had sent out invitations to a very special on-site meeting inside the new bridge. The entrance point was in Rheingaustraße on the

Wiesbaden side. Together with the organizers of Hessen Mobil, the attendants crossed the Rhine inside the bridge over a distance of 1,280m. They were enthusiastic. Who would have expected that the interior of the new bridge would look so futuristic? Each of the six girder boxes is up to eight meters high and 20 meters wide. The path leads over a narrow walkway, and over a length of around 200 meters there is virtually nothing to be seen but rows of steel tubes, as well as steel girders and steel walls. Then it gets tight: bent over and one at a

time, the attendants had to pass through a narrow opening to get from one box girder into the next.

### Completion of a mammoth project

Up to 100 people per day worked on the bridge construction site as the earthworks for the new piers for the second half of the bridge, the demolition of the old structure and steel works were all carried out at the same time. Final completion is planned for autumn 2020, and in 2021 the complete bridge will be opened for traffic.



An animation of the detailed construction process can be found at [magazin.mannesmann-linepipe.com/en/ssb](https://magazin.mannesmann-linepipe.com/en/ssb)

## Complex structure, complex logistics

On-site preparations for the construction of the 1,280 m long steel superstructure were quite considerable. On the one hand, Rettbergsaue – the Rhine island crossed by the bridge – is a nature reserve, on the other hand, interference with river transport was to be kept at an absolute minimum.

The new bridge is part of the three-lane extension connecting to the A66 at the Schiersteiner Kreuz (junction). The first section in the direction of Mainz was built parallel to the existing bridge on newly founded supports. The new foundations for the bridge piers in the Rhine rest on up to 33 m deep piles. After completion of the welding work, the respective steel section was pushed 90 m in the direction of the Rhine on a feed track. As not only the Rhine but also a side arm had to be crossed, the procedure was carried out four times per direction of travel, i.e. eight times in all. The two gaps were closed

from a floating pontoon on the Rhine. Positioned on a 2,000 t steel structure, the approx. 120 m long middle sections were floated to the installation site by means of tugboats and barges. With the aid of hydraulic presses, they were lifted into the correct position and then welded to the structure. It was only for these maneuvers that navigation on the Rhine had to be interrupted. In the direction of Wiesbaden, the existing bridge piers were retrofitted and repaired in the Rhine. Apart from that, procedures in the second phase were the same as in the first. The opening of the new bridge is planned for 2021.



Project: Waste Disposal Wembley Park

No traffic jam, no noise,  
no stench. Down the pipe.



Within a few years, the once rundown Wembley area has become one of London's most attractive hotspots. This was made possible by a far-sighted master plan for district development, which also includes an innovative disposal concept that does not require garbage bins: the waste is simply vacuumed off - through pipes from Mannesmann Line Pipe.



The bid for the 2012 London Summer Olympics in 2005 was the initial spark for the revival of the once attractive and rich Wembley district in the northwestern London borough of Brent. However, the commitment to host the games around the new Wembley Stadium was based on three core promises: to create an Olympic Park as a new center for a socially disadvantaged region, to involve citizens and all stakeholders equally in the planning processes from the outset, and to leave behind sports facilities that meet the highest international standards.

It is thanks to efficient forward planning and the foresight of the planners for the use after the Olympic Games that the ambitious goals were achieved. In the meantime, a new urban district has been created, the so-called Wembley Park, for which a comprehensive master plan for use after 2012 was developed at an early stage. The project developer Quintain Ltd, which itself is based in London, was and is in charge of the project. By early 2017, Quintain had already invested 900 million pounds in the transformation of the district, according to its own figures. Further





No garbage truck will block the roads and commuter traffic here



planning includes construction measures up to 2026.

#### **New district with mixed use**

In a 350,000 m<sup>2</sup> area around the new Wembley Stadium, which opened in 2007, a completely new district is being built. Besides offering attractive apartments, the district will also take on important local tasks. In addition to a new primary school for 630 pupils, as well as 200 kindergarten places, further public facilities are planned, similar to the Brent Civic Centre which opened in 2012. State-of-the-art office units, retail space, cafés and restaurants as well as numerous sports, event and cultural facilities will provide around 8,500 new permanent jobs. The new district also

benefits from the internationally renowned Wembley Stadium. Around 11.5 million visitors came in 2016, and the new London Designer Outlet with over 50 outlet stores recorded over 7 million visitors in 2017.

#### **Every square meter on the test bench**

In order to achieve the ambitious goals of almost 30,000 m<sup>2</sup> of parking space and 170,000 m<sup>2</sup> of publicly accessible areas in Wembley Park, every square meter was put to the test. Traffic areas and infrastructure facilities were and are therefore planned and built to be as space-saving as possible. For this reason, the objective of the waste disposal concept is to be "sustainable, user-oriented and space-saving". No areas in buildings or in the public space



A smart solution: The chute inlets are color-coded according to the type of waste. No wasted space, no stench, no rattling, no cumbersome transportation.

Photos: © Envac



Opened in 2013, the London Designer Outlet houses over 50 stores, 20 restaurants and a cinema. In 2017, it recorded seven million visitors.

Photo: © alamy.com



At the central collection station, the containers are filled with waste separated by type behind closed doors. No sound or waste smell will be noticed from the outside. Full containers are exchanged and taken away by trucks within a few minutes.



Photo: © Envac

will be wasted on waste containers, no loud clattering of garbage bins will tear the inhabitants from their sleep, and no garbage truck will block the streets or rush-hour traffic. The whole thing was made possible by an invention of the Swedish company Envac: Waste disposal through an extensive underground pipe system.

**This garbage doesn't stink to heaven.**

Each of the building units in Wembley Park will receive three containers into which the inhabitants can dump their waste. However, some adapta-

tion is necessary. The waste bags must not be larger than 20 liters. The waste must be separated into organic waste, paper/cardboard and residual waste. A small chip, which is required to open the sluices, registers and allocates the amount of waste to the user. The sacks first fall into an intermediate container below the inlet chute. When a container is full, the waste is vacuumed off into the pipe system. "The pipes used for this purpose have a diameter of 50 cm," explains Nils Schmidt, responsible for the project at Mannesmann Line Pipe. Envac attaches great importance to the tightest

manufacturing tolerances so that nothing can get stuck inside the pipe. "Rotors create a vacuum in the pipe system and the refuse sacks are accelerated to around 70 km/h, so they virtually fly through the pipe system," explains Nils Schmidt. In a central collection station, containers are neatly arranged in rows next to each other. "Anyone who thinks it smells like garbage there is wrong," Schmidt says. According to the vacuum cleaner principle, the waste is sucked in and filled directly into closed containers. Thus the whole remains not only a clean but also a low-odor thing.

## This is how the "waste vacuum cleaner" works

**Waste collection according to the "vacuum cleaner principle" goes back to an idea by Olof H Hallström. As early as the end of the 1950s he developed the vision of simply vacuuming domestic waste away, an idea which the Swedish company Envac brought to market maturity.**

The system can be equipped with any number of chutes - depending on how differentiated the waste is to be separated. In Wembley there are three chutes: one for organic waste, one for paper/cardboard and one for residual waste. The inlets are opened manually and the waste bags with a maximum size of 20 liters for households and 120 liters for commercial waste are dropped down the chute, where they fall into an underground container. When a container is full, the control room receives a corresponding message. Rotors then generate a negative pressure in the pipe

system, which vacuums the waste out of the container and transports it in an airflow of 70 km/h to the central collection station and there directly into the correct waste container. Full containers are almost fully automatically exchanged and loaded onto trucks. In addition to central collection without specific space requirements, traffic obstructions and noise emissions, the system also leads to improved waste separation and thus to higher recycling rates. The pipe system with a diameter of approx. 50 cm is installed underground at a depth of about one meter.



### Smooth operation

Should individual bags of waste be too heavy or too bulky, this won't clog up the entire system straight away, because such bags are held back under the inlet chutes. The local waste disposal company receives an error message at the control center and a service employee can rectify the fault on site.

### Lasting cooperation

Mannesmann Line Pipe has been supplying HFI-welded steel pipes for the continuously growing pipe system since 2006. Nils Schmidt: "Thanks to our consistent high product quality and short-term scheduling of defined pipe quantities, we have been able to convince Envac as a supplier and as a partner."

The first users have been connected to the system since 2008. A positive side effect of the space-saving and almost traffic-free waste disposal concept is that the local waste disposal company can achieve a recycling rate twice as high as the London average and waste transports can be reduced by approx. 90 %.



Photo: © alamy.com

## Wembley Park

In 2002, the project developer Quintain Ltd purchased the area around Wembley Stadium. The aim is to turn the run-down area into a district worth living in, including local supplies and new permanent jobs.

Nearly 7,000 residential units, over 90,000 m<sup>2</sup> of state-of-the-art office space, the London Designer Outlet, a new primary school as well as numerous other public buildings and a large park will be available on completion of the restructuring project.

The concept seems to work out very well. In 2016, 11.5 million visitors came to the new Wembley Park district around the new Wembley Stadium, which opened in 2007. In all, approximately 8,500 new permanent jobs are to be created.





Image: © www.katowice.eu

Project: New construction of Katowice bus station

## Changing to the future



By means of numerous investments, Katowice is undergoing a transformation from an industrial city to a livable, future-oriented metropolis. In the transport sector, the construction of a new bus station is also part of the project. Mannesmann Line Pipe supplied the steel tubes for the unusual roof structure.

As part of the implementation of the "Katowice 2030" urban development plan adopted in 2015, the city administration defined investments of strategic importance. These investments focus mainly on four areas: quality of life, urban planning, economic development, transport and logistics.

### **New transport hubs for the promotion of sustainable transport**

The promotion of sustainable transport plays an important role here. The concept of the "Integrated Interchange System" envisages several new transport hubs in Katowice as an interface

between rail, bus, tram, bicycle and motorized individual transport. In addition to Park&Ride and Bike&Ride car parks, new stops will be created to ensure a smooth transition between trams, buses, cars and bicycles. The aim is the optimal intermeshing of the various - as sustainable as possible - means of transport at local, regional, supraregional, national and international level.

### **Bus station as a link**

A new bus station will also play a central role here. It will be located within sight of the main railway station, which will be reopened in 2012, with its shopping

center and direct connection to the city center. The bus station is not only the interface to the railway, but also connects Katowice with the airport, which is located about 30 km to the north and not yet connected to the Polish railway network. The importance of the connection can be clearly seen in the number of passengers, which has doubled to five million within eight years. There are now non-stop flights to 36 international destinations, including London, Rome and Frankfurt am Main.

### **Visiting card of modern Katowice**

The new bus station will thus become

the representative visiting card of modern Katowice for guests arriving from near and far. On a total area of 4,220m<sup>2</sup>, 15 covered bus terminals for regional, national and international bus traffic will be built. In addition, there will be around 130 car parking spaces and covered bicycle parking spaces. The two-story service building for travelers offers space for gastronomy, press and a baggage room. Regional traffic is handled on the ground floor, while the service and waiting areas for international long-distance traffic are located on the upper floor.

**300t steel tubes for an unusual roof structure**

Construction work began in 2018 and is expected to be completed by the end of 2019. For the unusual roof structure, Mannesmann Line Pipe supplied around 300 tons of HFI-welded steel tubes via Salzgitter Mannesmann Stahlhandel Sp. z.o.o. at Słupca.

Patryk Maciejewski was the responsible sales employee at Salzgitter Mannesmann Stahlhandel Poland and explains how the order was placed: "Our customer wanted to obtain the steel components required for the entire project from a single source. Via the Salzgitter AG Group, we were also able to supply



Image: © www.katowice.eu



*The possibility of changing the tube lengths up to two weeks before the start of production was decisive for the award of the contract.*

*Patryk Maciejewski, Salzgitter Mannesmann Stahlhandel Sp. z.o.o. at Słupca, Poland*

the corresponding steel girders and the required sheet metal.

However, it was not only the overall package that convinced the customer, but also the flexibility in production. "The possibility of changing the tube lengths up to two weeks before the start of production was decisive for the award of the contract," reports Maciejewski. Mannesmann Line Pipe delivered the 508.0 x 20.0 mm steel tubes to the processing company Kersten

Europe in Poland in 2018. There the tubes were bent to the specified radii before being delivered to the construction site in central Katowice at the beginning of 2019. Meanwhile, the foundation work has been completed, the service building is under construction and the first steel columns for the roof structure have already been erected. The bus station is scheduled to open at the end of 2019 as a change to the future for its passengers.



Photo: © alamy.com

**"Katowice 2030"**

Katowice, with a population of 300,000, is the center of the Polish metropolitan region of Silesia, which, depending on the definition applied, has up to five million inhabitants. With the implementation of its "Katowice 2030" strategy, Katowice is completing its transformation from an industrial city to a future-oriented metropolis. Major international events such as the UN Climate Conference in 2018 or the World Anti-Doping Conference in 2019 also provide for advertising abroad. The finale of the "Intel Extreme Masters" alone, the Gamer World Championships of the "Electronic Sports League", attracted 170,000 e-sport fans to Katowice in 2017.



Project: Sea Tank Terminal Antwerp

## Supplies for the "petrol station of Europe"



The port of Antwerp is the economic engine of the region of Antwerp, Flanders and Belgium. Its chemical industry cluster is considered the largest in Europe. With the restructuring and a major investment in the "Delwaide-Dock", the port is further expanding its position.

From fruit, vegetables and coffee to cars and wind generators – the port of Antwerp handles everything that goes into a ship. At the same time, it is home to one of the largest chemical industry clusters in the EU and, with its enormous crude oil storage capacities and numerous refineries, one of the largest, if not the largest, of the "filling stations" in Europe.

Maritime handling, industry and logistics go hand in hand in the port of Antwerp and account for 140,000 jobs. Containerized (130 million tons) and liquid goods (76 million tons) were the largest contributors to the record handling volume of 235 million tons in 2018.

### Always on the move

Everything is in motion, around the clock, and not just in the actual port. The port operator itself, the Antwerp Port Authority (APA), is also constantly pushing ahead with new projects, restructuring and the expansion of docks, quays and port basins. In 2017, the restructuring project of the Delwaide Dock located in the northern part of the port focused primarily on the right bank of the Scheldt. Until mid-2016, this was the home terminal of the Mediterranean Shipping Company (MSC), a major customer of the port. Meanwhile, MSC has relocated to the Deurganck Dock, which is currently being expanded.



"This investment is a further confirmation of our port's ability to attract major investors. It will also strengthen our position as one of the largest chemical clusters in the world."

Jacques Vandermeiren,  
CEO of the Antwerp Port Authority



### Two new major projects

For the free space available at the Delwaide Dock, the port operator was looking for a major investor that would fit into the port's portfolio. Eventually, the contract was awarded to one of the world's leading companies in the petrochemical industry, which wants to use Antwerp as the base for all imports, exports and transit traffic of its products in the Amsterdam-Rotterdam-Antwerp region (ARA). SEA-Tank Terminal Antwerp (STTA) was commissioned

to build a tank terminal on the 45 ha site. For the first project phase, a storage capacity of 750,000 m<sup>3</sup> was planned for refined products. In addition, new quays for inland waterway and seagoing vessels are being built at the 1,250 m long quay.

Parallel to the investments at the Delwaide-Dock, the Sea-Invest-Group is investing in the Hansa Dock, which is located in the port center. Initially, further tank capacities of 160,000 m<sup>3</sup> will be built on the site as an extension to the neighboring facilities of Sea-Tank

Terminal. The existing facility was commissioned in 2010 and was expanded by 340,000 m<sup>3</sup> in 2013. Its current capacity is 860,000 m<sup>3</sup>.

### Further expansion of the Antwerp chemical cluster

Once again, the Antwerp Port Authority is on the right track with this award: "This investment is a further confirmation of our port's ability to attract major investors. It will also strengthen our position as one of the largest chemical clusters in the world. This is very good



View of the construction site with the network of steel pipes that will connect the individual tanks with each other

The pipe racks are erected along the quay and contain the complex pipe systems for transporting and distributing various incoming and outgoing liquid goods.



news for the port and for our economy," Jacques Vandermeiren, CEO of the Antwerp Port Authority, announced in a press release.

#### **New quays and construction of over 900,000 m<sup>3</sup> tank capacity**

The operation of the new facilities on both docks will require a great deal of work. This includes upgrading the quay facilities and building tanks with a total capacity of over 900,000 m<sup>3</sup>. In addition, quays must be built for loading and unloading liquid cargo onto or from incoming inland waterway and sea-going vessels. The several kilometers long

pipings of the pipe racks – the complex links between the tanks – and the pipelines to the new quays, are currently also under construction.

The investors were looking for a reliable and efficient dealer for the required supplies of steel components. Eventually, the contract was awarded to the globally operating trading company Van Leeuwen, which specializes in steel tube and pipe and has numerous references in the chemical, oil, gas and energy sectors. Matthias Verhaegen was the responsible Van Leeuwen employee. "In addition to steel pipes, we also supplied the necessary flanges

and fittings," says the project manager. "For a project of this size, of course, you have to be able to rely one hundred percent on your supply partners. At the end of 2016, Mannesmann Line Pipe received an enquiry for the required HFI-welded steel pipes.

#### **Delivery of almost 22 kilometers HFI welded steel pipes**

Thorsten Bösch was the responsible project manager at Mannesmann Line Pipe: "It was especially the large diameters and cost-effectiveness of our HFI-welded steel pipes that convinced the customer." So Mannesmann Line Pipe

### Port of Antwerp

## The filling station of Europe

**The port of Antwerp is a cornerstone of the petrochemical industry in Europe. Over 40 million tons of crude oil are refined here every year.**

The port is a dock port at the estuary of the Scheldt, through the mouth of which ships of over 100,000 tons can sail inland. This reduces the distance to be covered by rail or road in cargo handling by over 80 kilometers.

A decisive factor for its size and importance is its central location in Europe: within a radius of 250 kilometers, there are five capital cities and the Rhine-Ruhr metropolitan region with 10 million inhabitants. Within a radius of 500 km, 60 percent

of the European Union's purchasing power is situated.

The port is the economic engine of the Antwerp, Flanders and Belgium region. From fruit, vegetables and coffee to cars and wind generators – everything that goes into a ship is transshipped here. Its chemical industry cluster is considered the largest in Europe. The combination of goods handling, industrial location and logistics services provides over 140,000 jobs.





View of the construction site at the Bevrijdings Dock. The work is rapidly progressing. After completion, up to 13 million tons of liquid goods will be handled here annually.



was awarded an order for 2,250 tons of HFI welded steel pipes in the sizes DN 300, DN 400, DN 500 and DN 600.

The ordered quantities were produced at the Hamm works in autumn 2017. Starting in mid-October, they were delivered directly to the construction sites at the two docks in the port of Antwerp. "Logistics handling was a particular challenge for us, seeing that almost 1,800 pipes had to be dispatched by truck within nine weeks," said Thorsten Bösch. "However, in close coordination with the responsible employees at Van Leeuwen and on the construction sites, everything worked



It was especially the large diameters and cost-effectiveness of our HFI-welded steel pipes that convinced the customer.

*Thorsten Bösch,  
Business Area Manager Sales*

out very well". The internal production planning, scheduling for further processing and logistics processing with the forwarding companies commissioned by Mannesmann Line Pipe also worked perfectly. Up to seven trucks a day left Hamm for Antwerp until shortly before Christmas 2017.

**Operational from the end of 2019**

Once the extensive investments have been completed, the liquid cargo volume at Delwaide Dock alone, which was renamed Bevrijdings Dock in February 2019, is estimated at 13 million tons. So there will be plenty of supplies for the "filling station of Europe".



Photo: © alamy.com



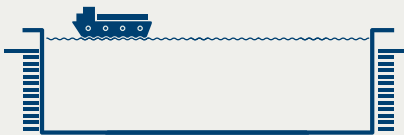
Photo: © iStockphoto.com

Project: Elbtunnel St. Pauli-Renovation, Hamburg

## Clever and simply ingenious



The St. Pauli-Elbtunnel was considered a technical sensation when it was opened in 1911. Since 2011, it has been a "historic landmark of the German art of engineering". Not only traffic, but also drinking water crosses under the Elbe - through steel pipes from Mannesmann Line Pipe.



The "old" St. Pauli-Elbtunnel crosses the Norderelbe over a length of 426.5 meters and connects the northern harbor edge at the St. Pauli landing bridges with the Elbe island of Steinwerder with two tunnel tubes. Even today, it is still used annually by around 40,000 cars, over 300,000 cyclists and around one million pedestrians.

### Historical Background

In 1895, around 20,000 shipyard workers and 25,000 dockers were employed in the Harbor of Hamburg. The ferry lines that

had existed since 1888 could no longer cope with the flow of workers to the opposite side of the River Elbe. In order to get the immense commuter traffic under control regardless of the weather, it was decided in 1904 to build a tunnel.

### A tunnel with two tubes and twelve elevators

Construction work began in 1907 under the direction of Otto Stockhausen, employing around 4,400 workers. No access ramps were built for the tunnel.



Hand trolleys were used to transport the 6 m long pipe sections to the lifts which took them down to the tunnel tube.



The HFI-welded steel pipes (DN 300) fitted precisely into the prepared ducts.



The 426.5 m long pipeline was installed completely without welding.

To this day, the vehicles are transported by elevators instead - four elevator shafts with one car each on each bank side. For pedestrians, the tunnel is accessible via fixed stairways and passenger lifts. The tunnel was opened on September 7, 1911 for pedestrian traffic and on November 30, 1911 for horse-drawn and motor vehicles. From that time onwards, the new tunnel was used up to twenty million times a year.

### Extensive rehabilitation work

On behalf of the "Hamburger Port Authority", a complex rehabilitation project was started in 1994 with the aim of restoring the tunnel's original appearance of 1911 while installing modern technology. In 2010, after the refurbishment of the shaft buildings, it was the turn of the eastern tunnel tube. In the course of the work, the existing drinking water pipe was also to be replaced. In 2017, Mannesmann Line Pipe received an initial enquiry from the Hamburger Wasserwerke GmbH. Thorsten Schmidt, the responsible division manager, forwarded the enquiry directly to ALPE Kommunal- und Umwelttechnik in Austria.

Alois Kluibenschädel from ALPE was delighted: "The tight space conditions in the tunnel and in the elevators made it clear that this is a case for our Fuchsrohr system." The system uses pipes in a standard length of 6 m, which need not

be joined by welding. "With its axially force-locking DKM joints and space-saving fittings, the system withstands service pressures of up to 40 bar, and it is reliably protected against corrosion," says the ALPE Managing Director. With this special order, he did not miss the opportunity to personally present the system and application technology to the planners of the Hamburger Wasserwerke and also to inspect the construction site. "Mannesmann Line Pipe then supplied us with HFI-welded DN 300 ZSK steel pipes in lengths of 12 m, from which we produced the specified 6-m sections in Stams and delivered them to Hamburg, complete with the required fittings," says Alois Kluibenschädel, not without pride in having been involved in the rehabilitation of a historic landmark.

### Drinking water for over two million customers

Laying the pipes without welding made the work much easier. The new pipeline passed the pressure test with flying colors, so it could be put into operation at the end of 2017 as part of the drinking water supply for over 2 million citizens of Hamburg. The east tunnel of the "old" St. Pauli-Elbtunnel has been opened to traffic again in March 2019. Work on the west tunnel will commence in May. Possibly also with HFI-welded pipes of the Fuchsrohr system.



The "old" St. Pauli-Elbtunnel

The people of Hamburg love it, the tourists are thrilled. The "old" St. Pauli-Elbtunnel has been part of Hamburg for over 100 years. The vertical clearance of the tunnel tubes – 4.7 m – is said to have been calculated to allow a "coachman with an upright whip in his hand" to pass through it. In the course of the extensive rehabilitation of the east tunnel, the entire tunnel skeleton consisting of 1,700 ring-shaped steel girders was excavated, around 200,000 rivet and screw joints were renewed and a total of 37 km of joints sealed.

### Opening hours for pedestrians/cyclists:

24 h/365 days a year; exception: December 31 (New Year's Eve) closed from 21:00 - 04:00 hrs. The opening hours for motor vehicles vary due to further rehabilitation work on the western tunnel tube.

### Prices:

Free of charge for pedestrians and cyclists  
Motor vehicles: single ticket € 2.00

### Further information:

Phone +49 (0) 40 - 300 51 701



Natural gas high-pressure pipeline in Lower Austria

## Minimal impact on the ecosystem

The Lower Austrian electricity and gas grid operator Netz Niederösterreich GmbH laid a new high-pressure natural gas pipeline to ensure sufficient natural gas supply to Burgenland. For the demanding pipe-laying project in nature and water reserves, Mannesmann Line Pipe delivered HFI-welded steel pipes with fiber cement mortar coating to the customer's specifications.

The new high-pressure natural gas pipeline from southeast of Velm to Mannersdorf replaces an undersized DN150 pipeline and will cover the increasing natural gas demand in northern Burgenland.

### Nature and water protection

Richard Karlberger, chartered engineer at Netz Engineering Gas of Netz Niederösterreich GmbH, points out: "It was a very demanding route with several river, railway, road and pipeline crossings, and we also had to cross the Mitterndorfer Senke, one of the largest groundwater reservoirs in Europe." Above all, the engineers had to deal

with extremely difficult soil conditions: In some cases, the groundwater level was less than 20 cm below ground, with unstable soils and thick layers of peat.

### Challenging conditions

With respect to the extensive nature protection requirements, the horizontal flush drilling technique had to be employed for a large part of the pipeline. Project manager Richard Karlberger: "We can draw on years of experience with this technique. But the special challenge with this project was that we had to use the horizontal directional drilling (HDD) method for an approximately six-kilometer section of the route."

### A convincing concept

Thorsten Schmidt was responsible for the project at Mannesmann Line Pipe: "Fortunately, we were able to present our expertise from numerous HDD installations to the responsible manager at Netz Niederösterreich and bring our experience into the challenging project.

In 2017, an about 1,000 m long test section was laid. Economically superior to a glass fiber reinforced (GFR) coating, the FCM-S coating in combination with the user-friendly MAPUR® casting resin field coating proved convincing as a system solution. "We also met the specifications regarding the length to be left uncoated at the pipe ends to

Left: The smallest possible pits were excavated to connect the individual HDD sections. The groundwater level was lowered with temporary wells.



the customer's full satisfaction," says Thorsten Schmidt.

Mannesmann Line Pipe then supplied around 14 kilometers of HFI-welded steel pipes with a diameter of 273.0 mm in lengths of 14 m. The pipeline in steel grade L360NE was dimensioned for a maximum permissible operating pressure of 70 bar. The steel pipes for the HDD strings were supplied in wall thicknesses of 5.6 mm, 6.3 mm, and 8.8 mm. For the FCM-S special design, they were given a 10 mm coating of fiber cement mortar.



*The system of pipe coating and field coating of the welds has completely convinced us.*

*D.I. (FH) Richard Karlberger,  
Project Manager Niederösterreich GmbH*

#### 18 site-specific boreholes

"In order to keep the impact on the nature reserves as low as possible, we have selected the drilling sections in such a way that the entry and exit points were positioned directly on field paths," continues Richard Karlberger. Where this was impossible, the access roads to the drilling sites were covered with steel plates.

The pipes for the HDD strings were field coated with MAPUR® casting resin in the weld area as a preparation for this pipe-laying process. It was not only the ideally matched FZM-S/MAPUR® system that was found convincing, but also the fact that the field coating achieved its maximum strength after only one day - even at temperatures around the

freezing point. In all, 18 horizontal boreholes were drilled for pipeline sections between 200 and 500 m in length and pipe-laying depths of up to 10 meters.

#### Eight-kilometer section laid conventionally

The remaining 8 kilometers of the high-pressure natural gas pipeline were laid using the conventional open-trench method. On the agricultural land, the soil was initially removed over a width of about 23 meters. The steel pipes were aligned along the route, welded, tested and field coated. The welded pipe string was then lowered into the dug-out trench and provided with sand bed-

ding. Subsequently, the pipe trench was backfilled and the topsoil was returned to its original position.

"The conventional open-trench method would have serious disadvantages for the ecologically sensitive natural reserves," explains Karlberger, who looks back with enthusiasm on the complex project. "I am more than satisfied about the way it went, and I would like to thank all those involved for their cooperation and their dedicated commitment."

After a successful pressure test, the integration and commissioning of the new high-pressure natural gas pipeline is planned for July 2019.



#### The HDD pipe-laying method

In the Horizontal Directional Drilling method – or HDD method for short – a horizontal hole is drilled below the ground surface. Through this hole the actual pipe is pulled in when the drill stem is retracted. The impact on the landscape is significantly lower than in conventional open-trench pipe-laying. But there are more advantages to the HDD method. For example, there is no need to lower the groundwater level over large areas, or to build seepage reservoirs. Furthermore, no water discharges are involved.



**2. Georgia**

Pipe laying as part of the Sectional Replacement Project of the Western Route Export Pipeline (WREP).



**6. Canada**

Michael Bick at our trade fair stand at the International Pipeline Exposition (IPE) in Calgary in September 2018.



**1. Germany**

José Pinto and Martin Fowler with representatives of Subsea 7 at an audit in December 2018 in Siegen, Germany.

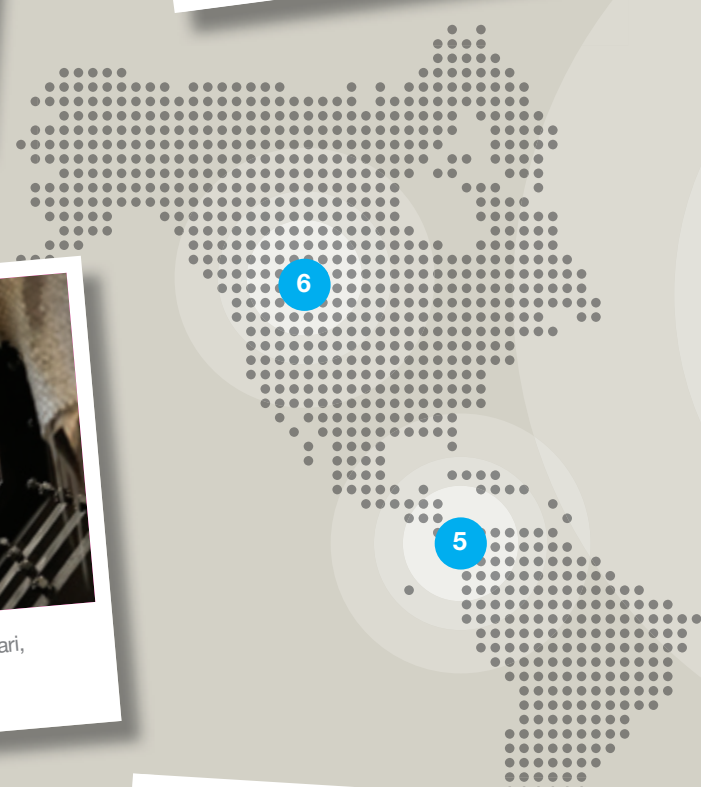


José Pinto and Shirin Espiari, Subsea 7.



**5. Colombia**

Michael Kosfeld inspecting delivered pipes in Barranquilla in March 2019.



On the go –  
from global to local



**1. Germany**  
Visitors to our stand at the Oldenburger Rohrleitungsforum on February 14 and 15, 2019.



**1. Germany**  
Visitors to our stand at IFAT, which took place from May 14 to 18, 2018, in Munich, Germany.



**1. Germany**  
Trade fair participation from the joint Salzgitter AG stand at the "Tube" in Düsseldorf, April 2018.



**1. Germany**  
Gas/oil line pipe customer conference on November 15-16, 2018, in Siegen, Germany.



**3. France**  
Valentina Berger and Cyril Lelievre, Managing Director JHC.



**4. Egypt**  
Cooperation trip with Hassan Fahmi, March 2019.

**Legal notes**

**Publisher**

Mannesmann Line Pipe GmbH  
In der Steinwiese 31  
57074 Siegen  
Germany  
Phone: + 49 271 691-0  
Fax: + 49 271 691-299  
info.mlp@mannesmann.com  
www.mannesmann-linepipe.com

**Responsible editor**

Birgit Quast  
Phone: + 49 271 691-201  
birgit.quast@mannesmann.com

**Concept, editing and design**

Kümpel Lorenz GbR, Büro für Gestaltung  
www.kuempellorenz.de

**English translation**

Ruth Baldwin, Mönchengladbach



Mannesmann Line Pipe GmbH  
In der Steinwiese 31  
57074 Siegen  
Germany  
Phone: + 49 271 691-0  
Fax: + 49 271 691-299

Postal address:  
Postfach 12 01 52  
57022 Siegen  
Germany

[info.mlp@mannesmann.com](mailto:info.mlp@mannesmann.com)  
[www.mannesmann-linepipe.com](http://www.mannesmann-linepipe.com)



**MANNESMANN**  
**LINE PIPE**

A Member of the Salzgitter Group