HFI GLOBAL

The magazine of Salzgitter Mannesmann Line Pipe for customers and partners

SALZGITTER MANNESMANN LINE PIPE
A Member of the Salzgitter Group

Issue 02 · February 2009

Cover topic Motor sport

The new Formula 1 race track in Abu Dhabi. Salzgitter and the DTM.

Dear Reader,

What has Salzgitter Mannesmann Line Pipe got to do with motor sport? This is the question we're investigating in our title story. Answers are supplied by the articles on the new Formula 1 race circuit in Abu Dhabi and Salzgitter AG's involvement in the DTM, the German Touring Car Championship.

While Abu Dhabi is another fine example of an exciting international project, the present issue shows that it is also worthwhile reporting on projects that have taken place on our doorstep, so to speak. 360 km long and stretching right across southern Germany, the Ethylene Pipeline South is undoubtedly exceptional, as impressively underlined by the employees responsible, Konrad Thannbichler and Stephan Maier, in their interview.

We are presenting another extraordinary project in our report on a district heating pipeline in Lower Austria. Here, heat in St. Pölten is being provided by biomass incineration in a new plant.

The controlled use of fire not only yields heat, but has also been the basic requirement for the evolution of a variety of welding processes. In our history section, we trace developments from hammer welding through to the high-tech HFI weld.

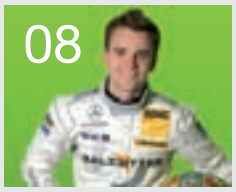
The ongoing development of Salzgitter Mannesmann Line Pipe as a systems supplier is the subject of the articles on our new product MAPUR® and on the optimization of our project management.

Last but not least, it gives me great pleasure to report some news that hasn't been explicitly mentioned in an article of its own. Marc Rasquin became a member of the Management Board of Mannesmannröhren-Werke GmbH on 1 July 2008. Along with his position as CEO of Salzgitter Mannesmann Line Pipe, he is also responsible for the HFI-Welded Pipe division.

Enjoy your read!

Jörg Hernando,
Sales Director, Fully Authorized Officer
Manager Water Line Pipe and Commercial Pipes

Contents



New speed record before the first race

When the first Formula 1 race takes place in Abu Dhabi in November 2009, yet another gigantic building project with utopian features will have been realized at lightning pace. And involved from the outset are tubes from Salzgitter Mannesmann Line Pipe.

Philippe Gurdjian, ADMM CEO, and Bernie Ecclestone in front of the model of the Yas Marina Circuit

»A Formula 1 Grand Prix is one of the world's most prestigious sports events, in the same category as the Olympic Games or a World Cup.«

Sheikh Mohammed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi

The countdown is on. Because since the finalization of the contracts by the Chairman of Formula 1 Management, Bernie Ecclestone, and Khaldoon Al Mubarak, Chairman of the Abu Dhabi Executive Affairs Authority, preparations and construction of the race circuit have been proceeding at breakneck speed. In view of the extremely short project term of two and a half years, what is true of Formula 1 itself applies very much to the construction of the new circuit: Every second counts.

And just as one has come to expect of building projects in the United Arab Emirates, it is a question not merely of a race track, but also of the re-design of an entire island. So it's hardly surprising that the original route design was completely overhauled in mid-2008 by Philippe Gurdjian, the new CEO of Abu Dhabi Motor Sport Management.

The Yas Marina Circuit, as the new circuit is officially called, is a successful compromise that will delight drivers, TV viewers and trackside fans alike. Firstly, the course has a challenging layout with its 20 bends, long straights and a top speed of 320 km/h, ensuring race thrills and spectacular overtaking manoeuvres. And it also has a special appeal to spectators at the track, as the course, much like in Monte Carlo, is partially embedded in the new cityscape under construction. Stunning are not only the new marina, Ferrari World in the midst of the race action and a hotel that straddles the track, but also the grandstand structures offering nothing but covered spectator seating. This will be joined by the 60 metre tall, panoramic Sun Tower that will give VIPs a unique view of the entire race action.

Shots from the construction site: Salzgitter Mannesmann Line Pipe supplied about 2,000 tons of tubes for the stands, stand roofs, the façade of the 60 m tall Sun Tower, pit and support pit buildings and for the mast structures of the floodlight system.

Left: Simulated picture of the grandstands. All seating is covered and ensures a spectacular view of the race course. Right: From the 60-metre high Sun Tower VIPs will enjoy a superb panoramic view of the race course.

Project planning that respects the culture

The project is being planned by ALDAR Properties PJSC, the leading real estate development company in Abu Dhabi. The Yas Marina Circuit is part of the development of Yas Island as a whole. Like other construction projects in the United Arab Emirates, the task involves creating a totally new residential and leisure environment. Along with the new race circuit, which has become a permanent fixture on the Formula 1 race calendar for an initial seven years, a total area of about 25,000 km² will be developed. In addition to hotels, upmarket sports and leisure facilities, an aquatic park and luxury properties, there will be a Warner Brothers Fun Park and roughly 350,000 m² of business and retail space. Notwithstanding all the unique features of the design, the project managers have also committed themselves to preserving the emirate's cultural and natural heritage. There are therefore no skyscrapers, and the architecture, while adopting a modern formal language, pays tribute to the cultural setting. Successful examples of this are the grandstand roofs and buildings along the track reminiscent of Bedouin tents. New areas have also been earmarked for regeneration of the island's to some extent dwindling mangrove belt.

»I'm very proud that Abu Dhabi can present one of the most sophisticated Formula One race tracks in the world. A hotel which spans the track, a marina with a beautiful yacht club, and with grandstands which are 100% completely covered – this has never been seen before.«

Philippe Gurdjian,
CEO Abu Dhabi Motor Sport Management

Expertise for the entire track

Salzgitter Mannesmann Line Pipe is making its expertise available all around the track. Steel tubes have been produced not only for the grandstands and the innovative grandstand roof structures, but also for the façade construction of the Sun Tower, the pit and support pit buildings and for the mast structures carrying the 700-kilo floodlights that will illuminate the track at night.

A total of about 2,000 metric tonnes of thick-walled tubes with outer diameters ranging from 219 to 610 mm have been supplied. From the production plants in Hamm and Siegen, the tubes went to a stockist and from there to a steel fabricator in Germany, where they were cut to the precise lengths and angles and in some cases precoated, before being shipped to their destination.

Building work at lightning pace

So that the circuit and the entire infrastructure will be ready in time for the start of race action in November, thousands of construction workers have now been withdrawn from other sites. Which means we can expect a speed record to be set before the first race – for the construction of the new race circuit itself.

Yas Marina Circuit data	
1st Formula 1 race:	1st November 2009
Track length:	5.52 km
Race length:	309.12 km (56 laps)
Top speed:	Roughly 320 km/h

Abu Dhabi Grand Prix

The Abu Dhabi Grand Prix will be a permanent fixture on the Formula 1 race calendar for an initial seven years as of November 2009. The circuit, still undergoing construction, is similar in design to the Monaco harbour course which makes use of public roads. The circuit, whose original plans were overhauled in 2008, also has a section resembling the Eau Rouge of the Spa-Francochamps track.

Top: Simulation of the marina with the grandstand roof structure reminiscent of a Bedouin tent
Right: Crown Prince Sheikh Mohammed bin Zayed Al Nahyan amidst prominent Formula 1 drivers

Passion and the will to win

A deep purr comes from the 4-litre V8 engines. At the start signal, the drivers open the throttle and accelerate away, and 460 hp leave a deafening noise and the smell of exhaust gases and burning rubber behind. Exactly the right mixture to give DTM fans goosebumps. And in 2009, Mercedes AMG und Salzgitter AG driver Jamie Green will again be in the thick of it.

»I have high hopes that I can win the championship in a Salzgitter car.«

Anyone who experiences the excitement in the pits at first hand and breathes in the air of the DTM will not forget the German Touring Car Championship in a hurry. The proximity of the star drivers, the authentic racing car atmosphere and the unique mix of qualifying, support programme, warm-up and the race itself all combine to ensure ever greater numbers of spectators. With this perfect blend of spectacle, event and sport, the organisers have succeeded in attracting other stars from the world of show business to the racetracks. And to top it all there are the races and the unsurpassed tension of the battle for the Championship. In 2008, this was again decided only at the final event, in Hockenheim. No wonder the German Touring Car Championship, as it has been known since 2000, has become Europe's most popular touring car series.

Since 2005, Salzgitter AG has also taken an active interest in motor racing. "Business and motorsport both operate on the same basic principles – passion, the will to win, readiness to work hard, fairness and team spirit are crucial factors" says Bernd Gernsdorff, Group Communications Manager, explaining the company's involvement.

After Norbert Haug, head of Mercedes motorsport, brought Jamie Green into the HWA-Mercedes works team in 2006, the talented newcomer has been the "works driver" of Salzgitter AG. The trade marks are the striking Salzgitter design and the green outside mirror of the AMG-C class Mercedes. After his first DTM season in 2006, as the then reigning European Formula 3 champion, the Englishman experienced his first DTM victory in the second-last race of 2007, in Barcelona. Just 21 days later, this was followed by his second success, in the final race of the season at Hockenheim.

In the 2008 season, driving more consistently, he gained another two victories for Mercedes and Salzgitter at Mugello (Italy) and at the Norisring in Nuremberg. Having finished the season in a very creditable fourth place in the drivers' classification, his future targets are ambitious. "I desperately want to win the DTM, and I won't even think about driving in other series before I have achieved this" says the friendly Englishman as he looks forward confidently to the new season. "I am happy with the excellent cooperation and the great trust placed in me by those responsible at Salzgitter AG. I therefore have high hopes that I can win the championship in a Salzgitter car."

On 26 April 2009, the long awaited day will arrive for all fans of the DTM. At the Hockenheim circuit, the 100th race of the German Touring Car Championship will kick off the new season. We are confident that Jamie Green and his team will show their familiar will to win and readiness to work hard in 2009. May Jamie be the new champion when the season ends at the Hockenheimring on 25 October.

For more information go to www.dtm.com

Jamie Green

Personal details
Born: 14 June 1982 in Leicester (England)
Marital status: Single
Place of residence: Leicester (England)
Height: 178 cm
Weight: 65 kg
Hobbies: Golf, football, shooting
Website: www.jamiegreenracing.co.uk

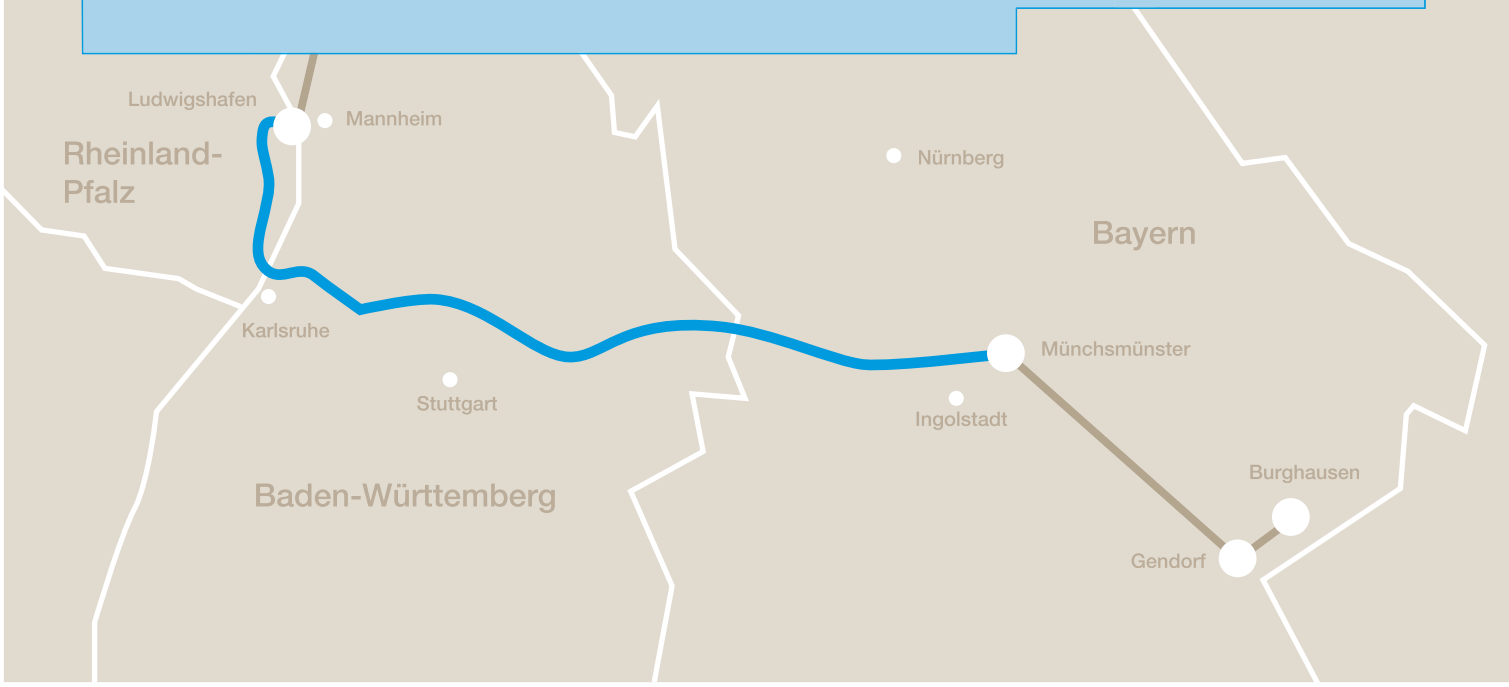
Career

Jamie Green was active in the world of karting from 1996 to 2001, and then switched successfully to the British Formula Renault championship in 2002. In 2003 he moved up to Formula 3. In 2005, as reigning European Formula 3 champion, he moved into the DTM, driving a Mercedes C-class for the Persson Motorsport team. In 2006, Mercedes motorsport boss Norbert Haug promoted him, together with team colleague Bruno Spengler, to the factory Mercedes AMG line-up. Jamie Green obtained his first DTM wins in the final two races of the 2007 season, in Barcelona and Hockenheim. These were followed by wins in Mugello and on the Norisring in the 2008 season, when he finished fourth in the drivers' classification.

Project Ethylene Pipeline South

Ethylene – inside and outside: 20,000 pipes for southern Germany

The construction of the Ethylene Pipeline South is creating the necessary infrastructure for the safe and economic transport of ethylene between key chemical sites in southern Germany. Salzgitter Mannesmann Line Pipe supplied 360 km of pipes for this technically and logistically highly demanding project.



Preparing to cross the Rhine near Karlsruhe: The underwater crossing will be given a heavy coat of concrete before it can be finally pulled in.

One of the large storage areas to which the pipes were delivered by rail. From here special trucks distributed the pipes along the route.

The main beneficiaries of this project are the metropolitan region of Ludwigshafen/Mannheim, the North Baden economic region, the Ingolstadt area and the Bavarian "chemical triangle" around Burghausen. The route runs from Münchsmünster near Ingolstadt straight across Baden-Württemberg to Karlsruhe. This stretch is followed by underwater crossings through the Danube, Neckar and Rhine. Continuing northward, it terminates at the BASF site in Ludwigshafen. The pipeline is expected to be completed and in operation during the course of 2009.

Link-up with north-west European ethylene network – prospects for Europe as a whole

The new pipeline will be connected to existing supply systems: in Bavaria, to the pipeline between Münchsmünster and Gendorf/Burghausen, and in Ludwigshafen, to the pipeline to Wesseling, and hence to the ethylene network in north-west Europe. This will open the way to further steps in the expansion of the European network: links to the Czech Republic, Italy, Croatia and Austria, with further options through Slovakia to Hungary, and towards France. The planned pipeline is therefore simultaneously a connection module and part of a future closed trans-European ethylene pipeline network. It will play a part in eliminating the disadvantages of the petrochemical industry in Europe relative to the USA and the Middle East, and increasing its global competitiveness.

Constructor and operator in one

The client for this major project is Ethylen-Pipeline-Süd GmbH & Co KG (EPS). EPS is a joint project between seven leading petrochemical and chemical companies. EPS is constructing the pipeline and will also operate it. The total costs of the project currently amount to 180 million euros. Financial support from the state of Bavaria gave the seven EPS shareholders the plan-

The EPS route
Existing pipelines

The route of the new pipeline runs across southern Germany, linking the Ingolstadt area and the Bavarian "chemical triangle" around Burghausen directly to the BASF site in Ludwigshafen.

Below: The parallel pipe strings of the LUKA (right) and EPS (left) wind their way from Ludwigshafen to Karlsruhe. Right: Most of the route follows existing power line and supply line routes.

ning security they needed, and their approval of the final financing concept in October 2006 was the starting signal for the project.

Safety is top priority

The safety and protection of citizens and the environment were the main factors guiding the choice of the route. Special aspects of the settlement pattern, urban development and protection of the landscape and nature were taken into consideration. To minimise the impact on the landscape, almost 90 % of the planned route runs parallel to existing supply lines. Construction and recultivation are carried out so carefully that normal land use can be resumed immediately afterwards. The pipes for the 360 km pipeline in DN 250 with a wall thickness of 7.1 mm were produced by Salzgitter Mannesmann Line Pipe in L 360 MB grade with a PE coating. The finished pipeline will be operated at a pressure of 60 – 90 bar and will carry up to 400,000 tonnes of ethylene each year. Besides a monitoring system, the pipeline is also provided with shutoff stations every 12 to 18 km.

The new pipeline will play a part in eliminating the disadvantages of the petrochemical industry in Europe and increasing its global competitiveness.

Demanding logistical performance

The logistical development of the project was perhaps even more demanding than

Left: Andreas Weishaupt, EPS Technical Manager, and Stephan Maier, Project Manager at Salzgitter Mannesmann Line Pipe, at the Rhine crossing near Karlsruhe. Top: Preparation of the underwater crossing. Underwater crossings are manufactured on land and then pulled into a river. One of the three pipe strings is already available in reserve for further projects.

the production of the pipes to the exacting customer specification. About 20,000 pipes had to be delivered precisely on time to some 10 storage depots along the pipeline route. The logistics planners of Salzgitter Mannesmann Line Pipe achieved a transport rate of more than 45% by rail, eliminating the need for approximately 400 truck journeys. The section of the route from Ludwigshafen to Karlsruhe also required precise coordination, as BASF's LUKA pipeline had to be laid in parallel. Salzgitter Mannesmann Line Pipe supplied 75 km of pipes of almost the same type for this.

Operation on common carrier principle

Access to the new pipeline will not be restricted to a closed circle of users. Rather, the pipeline will be operated on the common carrier principle, with access to all, from the very beginning. All ethylene producers and buyers and other interested parties will be able to use the pipeline under the same terms and conditions. The significance of this open access can be gauged from the fact that the MiRO fuel refinery in Karlsruhe has decided to connect its site to the EPS pipeline.

Ethylene production and use

Ethylene (C_2H_4) – also referred to as ethene – is a colourless, flammable gas with a slightly sweet odour. Mixtures of 3 to 29 percent by volume of ethylene with air are explosive. The double bond between the two carbon atoms makes ethylene highly reactive. The readily formed products of such reactions include ethyl bromide, ethene-1,2-diol and polyethylene.

Ethylene is an important base material for the chemical industry. It is used to make, for example, films, adhesives, sealants, plastic bottles and detergents. Many medicines also contain ethylene. Last but not least, Salzgitter Mannesmann Line Pipe is dependent on ethylene, as polyethylene coating protects the supplied steel pipes against external influences and corrosion. And that is the really unique aspect of the EPS pipeline: ethylene – inside and outside.

In charge of the project are Konrad Thannbichler (left) and Stephan Maier (right).

»Direct contacts are still very important«

The EPS Pipeline South, with a length of 360 km and a planning period of about 5 years, is an enormous challenge for all project participants. In Siegen, we spoke to the responsible Salzgitter Mannesmann Line Pipe representatives Konrad Thannbichler and Stephan Maier.

What has impressed you most about the project?
K.T.: The size of the project, with a total length of about 360 km, is certainly unusual for Germany. However, a project is often distinguished by the way those involved work together rather than by its size. Co-operation during the EPS project has been, and still is, excellent and based on trust. This starts with the technical monitoring of the construction and the commercial development, and also includes close contacts with the construction managers on site.

What was the decisive factor that resulted in Salzgitter Mannesmann Line Pipe winning the contract for the project?
K.T.: A number of factors were decisive for the customer. One factor which was certainly very important was the active support of direct contacts during the formulation of the specification to which the pipes were finally manufactured. All details were discussed and agreed at an early stage with TÜV SÜD (the supervisory agency), the responsible consulting engineer and EPS.

S.M.: Moreover we were able to demonstrate some very interesting variants for solving the logistical problems. Naturally the price was a key factor, but the total package, with our renowned product quality, was ultimately decisive.

Which requirements deserve special mention?
S.M.: Given the scope of the project, our own logistics people were involved at a very early stage. The plan was for about 50% of deliveries to be transported by rail. Otherwise about 900 trucks would have been needed to carry them by road. Suitable storage depots with rail links had to be identified within reach of the pipeline route. The depots also had to be surveyed and approved in good time, so that any necessary improvements could be carried out in line with quality assurance requirements.
K.T.: From the initial planning to the realisation, a number of implementation options were discussed, some of which were developed further, so that the best variant for all concerned could be precisely defined. After this identification phase, the Technical Customer Advice department was brought in to adapt the specification accordingly.

What is the contribution of project management to projects of this size?
K.T.: We contacted the customer at a very early stage. That is a good starting point for the planning, of course. After the first technical discussions, our Technical Customer Advice department checked the EPS specification for the realisation and for conformity with the relevant standards. Logistics and Purchasing were then brought in for the concrete quotations. Before production started, our usual preproduction meeting was carried out with the client (EPS) and the responsible TÜV SÜD. Our Manufacturing and Inspection Plan (MIP) was presented and approved. Discussions of this type are greatly appreciated by our customers. Our quality department was in contact with the TÜV responsible for monitoring production during the entire manufacturing process.

Were there any surprising project changes during the implementation phase?
S.M.: There were no technical changes during the entire production period, apart from additional quantities being ordered for further processing and extra pipe bends. We supplied an additional 16 km of pipes to TDC, Trollenhagen, near Neubrandenburg, for further processing. The pipes were coated with glass-fibre-reinforced plastic there, and then transported to the pipeline section where they were needed.

Were the project milestones reached on schedule?
S.M.: Given the scope of the project, there was of course considerable pressure to stay on schedule. In retrospect the good advance project planning and the incorporation of time buffers in the schedule proved to be highly advantageous, as we were able to optimise the welding lots at the mill. As the depots were also provided with sufficient pipe material, there were no delays or construction stoppages.

How important is direct customer contact?
S.M.: During the realisation of the project, contact to EPS was maintained and intensified. Talks were held on the construction site and with the commercial and technical departments in Munich. Further talks and contacts were necessary to coordinate the pipe deliveries. As always, our customers regard personal communication with direct contacts as very important.

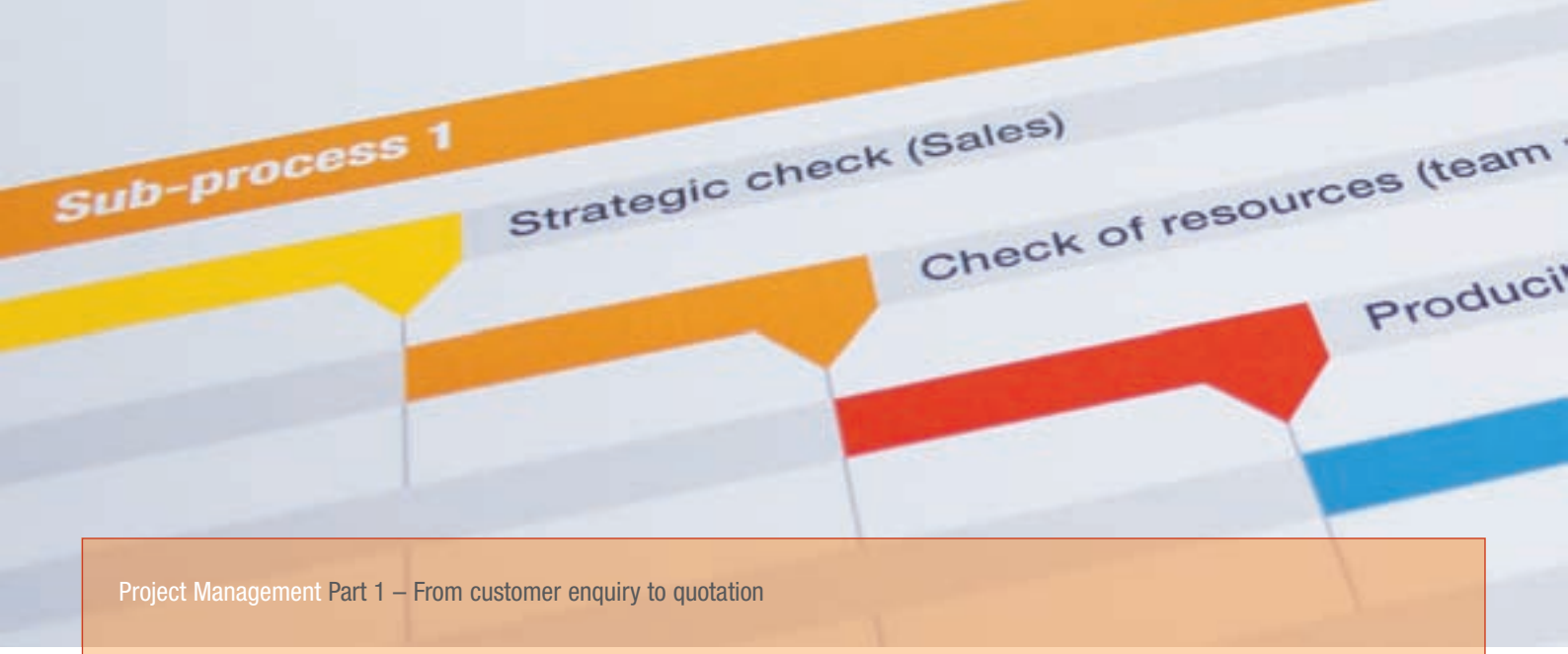
What are the prospects for Salzgitter Mannesmann Line Pipe in the chemical sector?
K.T.: The chemical sector is certainly an interesting potential customer for us. Given the increased logistics costs, and taking safety into consideration, there is major development potential for all materials that can be conveyed through pipelines. We are therefore confident that there will be a shift from transport by road, rail and water in favour of environmentally friendly and safe pipelines.

Konrad Thannbichler
born on 08.11.1968 in Traunstein, married, 2 children

Konrad Thannbichler has been Sales Manager for gas and oil line pipe at Salzgitter Mannesmann Line Pipe for the Central European region since 2003. Prior to this, he ran the project department at a manufacturer of special-purpose machines in Munich.

Stephan Maier
born on 10.12.1961 in Siegen, married, 3 children

Stephan Maier has been working for Salzgitter Mannesmann Line Pipe for 20 years. Initially employed in internal sales, he works today as the Sales Territory and Project Manager for water, gas and oil line pipe. He is responsible for central and southern Germany.



Project management – the next step

Against a background of ever larger projects, with ever increasing requirements and more stringent material specifications, professional project management ensures a smooth exchange of information between customers and project managers at Salzgitter Mannesmann Line Pipe.

At project meetings, the emphasis is on an exchange of information between the project management and specialists from the various departments

In the wake of a significant rise in the number of large-volume international projects, Salzgitter Mannesmann Line Pipe decided to make changes to its project management. The outcome is a professional and structured procedure for the handling of all projects, whatever their magnitude or complexity, by Quality Management and Sales.

Sales and QM as a planning team

"How can prompt and efficient exchange of information between customers and Salzgitter Mannesmann Line Pipe be achieved, and how can we ensure that the quality requirements agreed with customers are complied with during production?" was the core question addressed by the planning team, consisting of personnel from Sales and Quality Management.

Division into quotation and order phases

First of all the total planning process, from the customer's enquiry through to the supply of the materials, was divided into two sub-processes. These are the quotation phase, with

- **Project check**
- **Project meeting**
- **Project planning**
- **Customer coordination**
- **Project costing**
- **Quotation drafting**

and the order phase, with detailed planning, material planning, pre-production meeting, production, quality assurance and shipping.

Clear definition of responsibilities

One of the core aspects in project management at Salzgitter Mannesmann Line Pipe is the clear definition of responsibilities. Responsibility for the execution of the quotation phase rests with the appropriate project manager. At Salzgitter Mannesmann Line Pipe, this is the salesperson who is responsible for the project. He coordinates all the process steps and the participating technical departments (Logistics, Planning, Quality Assurance, Technical Customer Advice, Purchasing and Production).

Differentiation into standard and special projects

First of all, the project is systematically analysed with the help of a revised checklist for "Characterising special projects". The evaluation of the checklist gives the project leader an efficient basis for deciding whether the project should be categorised as "standard" or "special".

The questions still facing the individual technical departments are then worked

through just as systematically. With the help of the checklist, the project manager decides which technical departments must be integrated into the planning team for this project. The contacts in the individual technical departments support him during the quotation phase in all matters concerning production feasibility, and during the order phase in all matters concerning the realisation.

Project meeting

The project manager forwards all relevant documents to the employees involved so as to check whether production is feasible. After a suitable interval for carrying out these checks, a project meeting is held, at which all participants are present. The emphasis here is on an exchange of information between project management and the specialists from the various departments, as maximum synergy can be generated here in the cooperation of the technical departments. Only in this way can a solid basis be created for realistic project costing.

Drafting a project plan

At the project meeting, the information from the individual technical departments is brought together to create a project plan. With the help of the "project commitment", the current status is documented in terms of production feasibility, actions, responsibilities and any agreements with the customer. The completed project plan is used to produce a technical commentary, which is subsequently submitted together with the quotation, and the current status, any deviations in the quality requirement and a comparison of the customer's requirement and the production options are documented. This document subsequently serves as a basis for the Manufacturing and Inspection Plan (MIP*) agreed between the customer and Salzgitter Mannesmann Line Pipe.

Costing and drafting a quotation using SAP

After the project plan has been drafted and, if necessary, revised in agreement with the customer, computer-aided costing of the project can be carried out on the basis of the actual figures. The system makes use

of project-specific quality data, which has been entered into the SAP quality data on the basis of the agreements reached with the customer. This SAP module, which was developed specially for Salzgitter Mannesmann Line Pipe, contains all quality data (derived in consultation with the customer) from standards and specifications which will be of relevance for the subsequent execution of the contract. With the help of this fully integrated computer-aided system, all essential information relating to the customer's invitation to tender can be checked promptly and efficiently in relation to technical feasibility, brought together to form a project plan and, if necessary, agreed with the customer. After the agreed quality criteria have been incorporated into the SAP system, the quotation can be drafted on the basis of all the relevant project data.

Central documentation

Central documentation is of crucial importance during the course of the project. The documentation, which is based on the automotive industry's PPAP** procedure, contains the up-to-date versions of all relevant documents in chronological order. The project leaders and the technical departments store all documents concerning the enquiry – quotation, manufacturing and inspection plan (MIP), invoice, etc. – so that the project leader and the technical departments can always access the current status of the project.

Order phase

The project management procedures that apply after an order has been received, including those relating to the transfer of customer-relevant information from the computer system to production units and documentation, will be described in detail in the next edition of HFI Global.

* MIP = Manufacturing and Inspection Plan
A document containing all quality relevant data of an order (applicable standards, specifications and customer requirements, incl. tolerances, type and scope of testing and testing frequency).

** PPAP = Production Part Approval Process
A structured process initially developed for the auto industry but meantime used across all industries. PPAP ensures that outsourced components comply with the quality specifications, that this is documented, and that this quality is maintained throughout the life of the product. PPAP documentation shows whether or not a supplier has understood the manufacturer's requirements.

Sales partner Salzgitter Mannesmann Stahlhandel GmbH

The importance of performance

Salzgitter Mannesmann Stahlhandel GmbH can look back on over 40 years of competence and industry experience. Along with a wide range of sections and rolled steel, tubes and pipes are also a major factor in its success. Thanks in large part to its close cooperation with Salzgitter Mannesmann Line Pipe, the company can claim to be the only full-range supplier in the district heating pipe sector in Germany.

Jens Rojahn
Manager for Pipes and Custom Machining at Salzgitter Mannesmann Stahlhandel GmbH

Mathias Berger
Manager Pipe Sales Region West and Product Manager Hollow Sections and Thick-walled Pipe, Salzgitter Mannesmann Stahlhandel GmbH

Ilker Santiña
Manager Pipe Sales Region North and Product Manager Commercial Pipe, Salzgitter Mannesmann Stahlhandel GmbH

Integrated in the trading structure of the Salzgitter Group, the company sees itself as serving the Group's productive companies on the German market. Its core business is that of a steel stockist, which may sound simple, but with 16 locations and a product range unmatched anywhere in Germany, Salzgitter Mannesmann Stahlhandel GmbH is in fact a highly complex enterprise. The company trades with the entire spectrum of the Salzgitter Group's product portfolio, i.e. sections, girders, flat products and tubes & pipes of all sizes and grades. This is supplemented by a broad range of flame-cut products and custom-machining services from its own plants and with cooperation partners.

Open-warehouse strategy

"A key factor in our company success is the strategy of the open warehouse," explains Jens Rojahn, Manager for Pipes and Custom Machining. "This means that all sales staff have access at all times to all stock at all warehouse locations in Germany."

By setting up its own service department, the company responded to demand from numerous customers for complete components and for comprehensive warehousing and logistics service. "This also satisfies the wish to minimize risk. There's a growing desire among our customers to shed the burden of capital outlay, place the responsibility for supplies of materials in competent hands and achieve this with as little manpower of their own as possible," says Rojahn, explaining the reasons for the creation of the department. The specialists of Salzgitter Mannesmann Stahlhandel are concerned with everything to do with materials management, the handling of distribution and purchasing services, and outsourcing activities.

This is yet another fine example of how the company differs from other traders. "We want to make an impression on our customers by improving our performance and thus become the preferred partner in their process chain," says Rojahn expressing his satisfaction with the company's sustained success.

Cooperation in district heating pipe business

The company has been engaged for many years in successful cooperation with Salzgitter Mannesmann Line Pipe. In the field of HFI-welded steel pipes, Mathias Berger and Ilker Santiña are the main contacts at Salzgitter Mannesmann Stahlhandel GmbH. What's new is cooperation in district heating pipes. They are both highly appreciative of this close cooperation. As the only full-range supplier in Germany, the company is now capable of supplying longitudinally welded products from 1 to 24 inches and with a maximum length of up to 18 m.

Salzgitter Mannesmann Stahlhandel GmbH	
Workforce:	1,070
Head office:	Düsseldorf
Sales:	1.5 billion euros
Turnover:	1.5 billion tonnes of steel, of which 210,000 tonnes is tubes and pipes

As a steel stockist and trading company, Salzgitter Mannesmann Stahlhandel GmbH is integrated in the strategic trading structure of the Salzgitter Group. With 16 locations and branches across Germany, the company serves customers in Germany and neighbouring countries. Its portfolio includes flat products, steel sections, tube and pipe, and tube accessories.

Steel tube & pipe services:

- Contour cutting and threading
- Roll milling
- Linings
- Prefabrication from drawings
- Brushing, deburring, descaling and chip-free washing of precision steel tubes

Surface treatment:

- Shot blasting, priming, galvanizing, PE-coating

Project District heating project in Lower Austria

St. Pölten goes for heat from biomass

Reducing the carbon footprint, becoming independent of gas and oil, and intensifying the use of regional resources – this is the approach pursued by the public utility company in St. Pölten in Lower Austria when it comes to its energy supply. And making this possible are district heating pipes from Salzgitter Mannesmann Line Pipe and Isoplus Fernwärmetechnik.

Frank Meyer
Sales Division Manager
Salzgitter Mannesmann Line Pipe GmbH

Kjell Rieckmann
Team Leader
District Heating Pipe
Salzgitter Mannesmann Handel GmbH

To supply about 20,000 district heating customers in the capital of Lower Austria, resort will be made among other things to a regional heat generation mix as of the end of 2009. The heat comes from a total of three sources at the Dürnrohr EVN power plant site 32 km away. These are the waste incineration plant that converts the energy content of domestic waste into heat, the two blocks of Dürnrohr's combined heat and power (CHP) plant, and a new biomass plant.

Immense CO_2 savings

The generation of heat from residual waste and biomass alone will cut CO_2 emissions by over 40,000 tonnes per year. In the biomass test plant that went into operation in 2008, the high-grade biogas generated will be used in the neighbouring CHP plant as a substitute fuel. Now that the trial operation of the test plant has been successfully completed, expansion plans are already underway. The new plant will then mainly process agricultural biomass such as cereal and maize straw, lucerne plants and energy grain. In its initial form, the plant will have a thermal output of 3 megawatts. The input of the generated biogas alone is capable of saving up to 2,000 tonnes of hard coal and 7,000 tonnes of CO_2.

The centrepiece of the plant will be an indirectly heated rotary furnace in which the biomass is heated with the exclusion of air to about 450 to 650 °C. In this process, pyrolysis gas and pyrolysis coke are produced for heat generation.

The biomass plant has annual agricultural biomass needs of about 1,600 tonnes. Overall, EVN and St. Pölten's public utility company will not only secure jobs and incomes in farming, but will also make a noteworthy contribution to environmental and climate protection.

Transporting heat over 32 kilometres

The district heat supply in St. Pölten is only possible, however, thanks to a new district heating pipe. The route runs from the power plant site in Dürnrohr in the parish of Zwentendorf along the Perschling Canal and through the Traisental valley as far as the regional capital.

In cooperation with Salzgitter Mannesmann Handel in Hamburg, Salzgitter Mannesmann Line Pipe supplied a total of about 48 km of bare black pipes of diameters DN 400 and DN 450 for further processing at the Isoplus Hohenberg production site in the immediate proximity of the pipe route. Here the pipes were coated to the specified thicknesses: standard for the return line, increased for the DN 400 supply line, and special, even further increased for DN 450. Just-in-time deliveries of the coated pipes to the construction sites along the route have been underway since May 2008. First of all, the pipes are placed on wooden blocks parallel to the topsoil-cleared route, where they are welded together and then lowered in single string sections up to 700 m long into the freshly excavated pipeline trench. This procedure familiar from pipeline construction is necessary, as in many areas the trench floor is well below the water table and the trench can only be kept dry for a brief period. The logistics for this is being handled by Trost, a company that has had many years of experience of gas pipeline construction in Austria.

Commissioning at the end of 2009

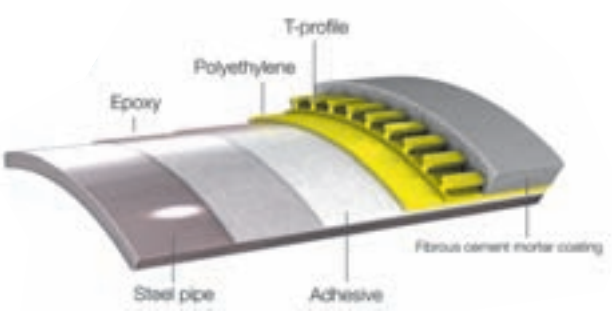
After commissioning in October 2009, the pipeline will carry about 200 GWh of district heat per year to about 20,000 customers.

The fact that a distance of over 32 km can be covered shows how little heat is lost thanks to the efficient insulation of the pipes. The heat is fed into the pipeline at Dürnrohr power plant at 140 °C. 32 km later, the heat leaves the pipe at St. Pölten's public utility company at a temperature of 138 °C. The public utility company distributes the heat to end consumers via the existing secondary grid.

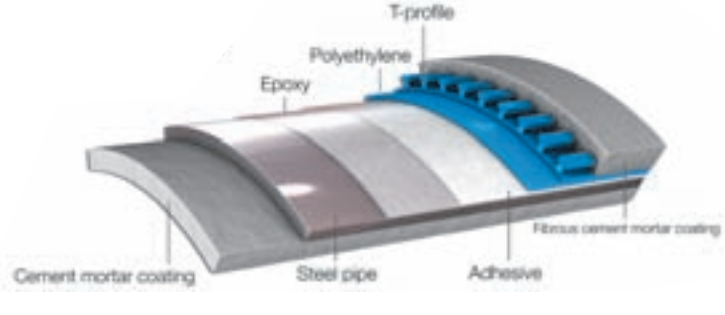
Anton Steindl and Frank Meyer, responsible managers at Isoplus and Salzgitter Mannesmann Line Pipe, have summed up the successful project with the following words: "We're very happy to make our expertise available for this innovative supply strategy."

Product innovation for trenchless pipe-laying

When it comes to laying pipe crossings beneath buildings, rivers and traffic routes, trenchless methods are the state of the art. With a new pipe end design and a quick-curing casting resin for field-coating, Salzgitter Mannesmann Line Pipe has now completed its product range for trenchless pipe-laying.

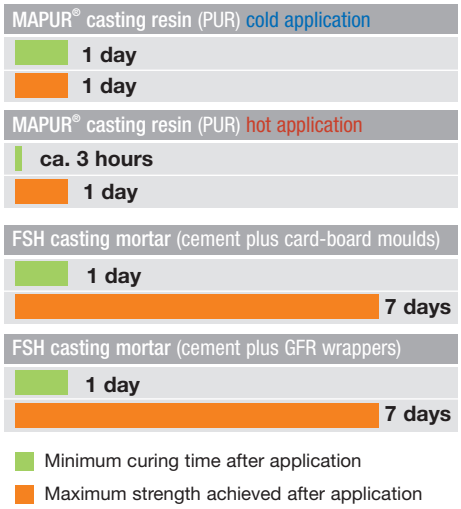


Schematic representation of the new pipe end design on an oil or gas line pipe



Schematic representation of the new pipe end design on a water line pipe lined with cement mortar

Overview: Curing time and strength



The main advantages of the new MAPUR® casting resin are related to its significantly reduced curing time.

The new MAPUR® casting resin has proved its time saving potential in numerous field tests.

Thanks to the huge range of material grades and wall thicknesses, the key advantage of steel pipes is that pipe design can be adapted to the specified tensile forces. For trenchless methods, there are also a wide range of coatings and linings available to suit the application and the soil.

However, the success of a project is not solely dependent on the pipe supplied with the appropriate coating. For the handling and assembly of the entire pipeline also have to be adapted perfectly to the laying process. The currently available solution of field-coating is in many cases less than ideal, and this is where the optimized system gives a significant boost to the reliability of pipe-laying.

Pipe production with the FCM-S coating

The highest degree of reliability is achieved with an FCM coating as additional mechanical protection for the corrosion-protected line pipe. In its FCM-S version, this protective coating is designated specifically for trenchless pipe-laying in the DVGW Worksheet GW 340.

To produce this version, the polyethylene coating is extruded with an axial T-profile. While the coating is still hot, coarse polyethylene particles are fused onto the surface to give the ribbed coating a rougher structure. In this way, mortar movement is completely ruled out both in the circumferential and the longitudinal direction. The T-ribbing also makes it possible for the mortar to key more tightly with the pipe.

New pipe end design

When the pipes have been welded together into a string, all the pipe joints have to be protected from corrosion. In addition, the mortar field coating must be applied in the joint areas before pulling in the pipe string.

In the case of the new version of coated pipe for trenchless pipe-laying, the T-ribbing on the last 2 to 3 cm of the pipe ends is no longer covered with cement mortar. This ensures that the field-coating can also hook up mechanically with the pipe's cement mortar coating.

MAPUR®, the extra-fast field-coating

Available for field-coating are both casting mortars and casting resins. Casting mortar is easier to handle, but inevitably yields less-than-optimum results. In most cases, the curing time in the course of a project is too short for the field-coating to achieve the same mechanical properties as the existing pipe coating.

Salzgitter Mannesmann Line Pipe has now developed MAPUR®, a sand-filled polyurethane-based casting resin. This novel material satisfies all the expectations of a field-coating, but sets much faster as well. The initial series of tests have shown that its mechanical properties after only a few hours are comparable to those of the factory coating.

»Thanks to targeted further development, both the FCM-S line pipe and the field coating material now have technical properties which are unparalleled by any other product in the market. Examples include the improved shear load resistance of the product innovation, which provides enhanced safety and reliability in trenchless pipe-laying projects.«

Jörg Hernando

Service as part of a package

Because the new MAPUR® requires special know-how, Salzgitter Mannesmann Line Pipe recommends having the field coating operations done by a specialist service company. The Frankfurt-based firm SKI has extensive application experience based on numerous field tests with MAPUR®.

Perfect component match

Despite all the economic advantages, any decision for or against trenchless pipe-laying will depend essentially on confidence in the laying method and on the suitability of the materials employed. Salzgitter Mannesmann Line Pipe is therefore applying the systems approach: To achieve the best-possible results, all the components must be a perfect match. If the success of pipe-laying can be checked with measuring instruments, there is then hardly any difference from pipe-laying in open trenches in terms of reliability.

pre-1800

Hammer welding – the ancient process

Hammer welding, with the smithy forge, hammer and anvil, is a centuries old trade and the oldest and original welding process.

1845

Albert Poensgen begins producing pipe by butt welding

In 1845, Albert Poensgen started up the first rolling mill in Germany, at Mauel near Gemünd in the Eifel, for the production of longitudinally welded wrought iron pipe using the butt welding technique.

ca. 1880

Development of the first electric welding process

James P. Joule found that the heating of an electric conductor depends on its electric resistance. This discovery led to the first electric welding processes.

From hammer welding to the high-tech HFI weld

For many centuries, stone, clay, wood and lead were the commonest source materials for the production of pipe and pipelines. The rapid industrialisation in the 19th century, however, called for large quantities of pipe at reasonable prices. That led to the development of a number of different welding processes, and the industrial production of metal pipe had started.

The swiftly expanding gas industry, in particular, suffered from the lack of serviceable and economically priced pipe. While in those days cast iron could still be used for the main pipes, finer pipes with smaller diameters were now needed for the branch connections and the service connections to the combustion point, and needed in such quantities that they could no longer be manufactured using the traditional techniques.

Hammer welding – the original process

Hammer welding, with the smithy forge, hammer and anvil, was a centuries old trade and the oldest and original welding process. In the 19th century, the new sheet mills and shears made it possible to manufacture strip, and this was used to make pipe by bending the strip and joining the edges under pressure by forge welding. Many companies – above all in the economically prosperous England of that time – set to developing better methods based on the old techniques, exporting the new pipe to the likes of Germany, where the market was only too eager to take it.

Poensgen – founder of the German welded pipe industry

In 1845, Albert Poensgen started up the first rolling mill in Germany, at Mauel near Gemünd in the Eifel, for the production of longitudinally welded wrought iron pipe. Using the butt welding technique, sheet strip was heated to welding temperature, fed through a funnel-shaped draw plate with the help of a draw bench and shaped to an open pipe. Since the strip was somewhat wider than the circumference of the pipe to be made, the longitudinal edges were pressed firmly together in the funnel and welded. By repeatedly heating and drawing the pipe through increasingly narrower draw plates, the pipe was drawn and stretched while at the same time the weld hardened.

Not long after launching the production of these "gas pipes", Poensgen also started producing boiler pipe. With this method, the chamfered edges of the sheet strip overlapped each other while the pipe, with a mandrel inside, was drawn to size under pressure between two rollers in a draw bench. Such pipes were also known as "patent welded".

Yet even the quality of these welded pipes could not, in the long term, satisfy the growing demands of the swiftly developing industries that were producing machines, vehicles and utility pipelines. The inadequate compressive strength of the welds, in particular, constituted a constant risk, as the statistics of steam boiler explosions demonstrate only too clearly. Even the welded pipe pioneer Poensgen had to turn down inquiries for welded pipe for manometers, and Carl Benz had solid steel rods drilled out individually by hand for the chassis of his patented vehicle in 1885.

1899

Mannesmann takes up welded pipe production

In 1899 Mannesmann started up production of fire and water-gas welded pipe at its own mill in Düsseldorf-Rath.

ca. 1930

Development of the Fretz-Moon process

Using the Fretz-Moon process it became possible to manufacture longitudinally butt-welded continuous pipe strings of any length.

1973

Salzgitter Mannesmann introduces the HFI welding process

From the outset, both the plant and the HFI welding process at Salzgitter Mannesmann Line Pipe have been improved on an ongoing basis. In 2007 the product range was extended to include 24 inch diameter pipe.

Competition from seamless pipe
The established welded pipe manufacturers reacted in great alarm when it was learned that Reinhard and Max Mannesmann had applied in 1885 for a patent for manufacturing seamless pipe from solid steel ingots purely by rolling. In the years that followed, after some initial entrepreneurial difficulties for Mannesmann, it looked for a time as if the seamless pipe would completely replace its welded counterpart. Yet this impression was misleading. For a start, the hope of being able to roll seamless pipe of every dimension soon proved to be illusory. In addition, the seamless pipes were considerably more expensive. The dimensional accuracy was not adequate for all applications either. So the welded pipe manufacturers soon started fighting back, one weapon being their threat to stop supplying pipe dealers who were selling the seamless Mannesmann pipe.

1899 – Mannesmann takes up welded pipe production
Mannesmann reacted to this challenge by setting up its own pipe welding mill in Düsseldorf-Rath and in 1899 began manufacturing fire and water gas welded pipe. Over the years, Mannesmann would go on advancing to newer, improved welding techniques. So today the company that pioneered seamless steel pipe also has more than a hundred years of experience in manufacturing welded pipe. Indeed, if you count the Poensgen Werke, which were integrated into Mannesmannröhren-Werke in 1970, the history goes back well over 160 years.

Almost forgotten – water gas welding
One welding technique which is today almost forgotten is water gas welding, developed in the 1880s as the earliest variation on pressure gas welding. In Germany the sheet mill Schulz Knaudt, a forerunner of the present Hüttenwerke Krupp Mannesmann GmbH, built the first water-gas production plant with mechanically operated water-gas welding torches in 1882. As late as the 1920s, water gas welding was still regarded as an established joining technique. Soon after, however, acetylene superseded hydrogen as a fuel gas.

The Fretz-Moon process
A further development of solid-state welding was the Fretz-Moon process. Developed in the early 1930s by the US American Moon and the German engineer Fretz, it allowed the manufacture of continuous longitudinally butt-welded pipe strings of any length. In Germany the process was introduced at the then Vereinigte Stahlwerke AG in Mülheim an der Ruhr (today the headquarters of Mannesmannröhren-Werke GmbH) in 1932. This principle was followed for the production of basic commercial pipe between 40 and 114 mm outside diameter right up until the 1990s. With modern equipment, the continuous pipe string could be rolled to diameters as small as about 13 mm.

Fusion welding processes
Various other processes emerged for pipe with large diameters which are manufactured not in a continuous process but in one-off production, the oldest of them being oxy-acetylene welding followed by, among others, submerged arc welding. Both are types of fusion welding processes.

Electric welding
Parallel to the methods described above, various electric or arc welding processes were developed from the 1880s onwards. These were based on James P. Joule's discovery that the heating of an electric conductor depends on its electric resistance. In 1898 the American Standard Tool Company was granted a first patent which allowed it to use resistance welding for pipe production. From the 1930s onwards, resistance welding took over as the main industrial welding process.

Here, too, it was a Mannesmann subsidiary of those days, the Kronprinz company, which was the first to use the method in Germany. The first steel pipes were manufactured by induction welding in the 1950s.

HFI welding
At Salzgitter Mannesmann Line Pipe, high-frequency induction welding has been used for longitudinally welding pipe since 1973. High frequency current heats the strip edges to welding temperature and they can then be pressed together and homogeneously welded under pressure rollers without additional filler metals.

This is the way in which quality pipe and MSH sections are produced today, both to standard specifications and sophisticated customer specifications in outside diameters of 4.5 to 24 inches (114.3 to 609.6 mm) with wall thicknesses between 2.9 and 20.6 mm.

Trade fairs and customer conventions

This year, too, Salzgitter Mannesmann Line Pipe will be present at numerous trade fairs throughout the world. We will also organise two customer conventions of our own. Further information and details of these events can be found on the Internet at www.smlp.eu under »News«.

February 2009

05./06.02.09
Oldenburg Pipeline Forum
Oldenburg, Germany
Stand no.: 1. OG-M-25

March 2009

30.03. – 03.04.09
Wasser Berlin 2009
Berlin, Germany
Hall/Stand: 5.2B / 504

April 2009

19. – 22.04.09
Aerion
Athens, Greece
Stand: Lymberopoulos

May 2009

12. – 14.05.09
Oil & Gas Uzbekistan
Tashkent, Uzbekistan

May 2009

13./14.05.09
119. ÖVGW-Jahrestagung
Graz, Austria
Joint stand with ALPE Kommunal- & Umwelttechnik

June 2009

01. – 04.06.09
SIEE Pollutec
Algier, Algeria
Stand: Biwater

June 2009

09. – 12.06.09
Expo Petro Gas
Bucharest, Romania
Stand: IMD

June 2009

23. – 26.06.09
MIOGE
Moscow, Russia

September 2009

22./23.09.2009
DVGW Anniversary Congress with gat 2009 and wat 2010
Leipzig, Germany

October 2009

01./02.10.2009
Customer Convention, Water
Salzgitter Mannesmann Line Pipe, Siegen

October 2009

05. – 09.10.09
World Gas Congress
Buenos Aires, Argentina
Stand no.: A 60

October 2009

06. – 09.10.09
KIOGE
Almaty, Kazakhstan

October 2009

15./16.10.2009
Customer Convention, Gas
Salzgitter Mannesmann Line Pipe, Siegen

November 2009

17. – 19.11.2009
OGT
Ashgabat, Turkmenistan

Flashlights

1 Trade fair stand at KIOGE, 7 to 10 October 2008 in Almaty, Kazakhstan
2/3 Trade fair stand at ADIPEC, 3 to 11 November 2008 in Abu Dhabi, UAE
4/5 Symposium on Trenchless Pipeline Renewal, 10 September 2008 at Salzgitter Mannesmann Line Pipe in Siegen
6 Customer Convention Water at Salzgitter Mannesmann Line Pipe in Siegen, 25-26 September 2008
7/8 Customer Convention Gas at Salzgitter Mannesmann Line Pipe in Siegen, 16-17 October 2008

Credits

Publisher
Salzgitter Mannesmann Line Pipe GmbH

Head Office
Siegen Works
In der Steinwiese 31
57074 Siegen
Germany
Phone: + 49 271 691-0
Fax: + 49 271 691-299

info@smlp.eu
www.smlp.eu

Concept, editing and design
Kümpel Lorenz GbR, Büro für Gestaltung
www.kuempellorenz.de

English translation
Ruth Baldwin, Mönchengladbach

Authors and co-workers
Jörg Hernando, Horst Dix, Dorothee Karches, Dr. Hans-Jürgen Kocks, Joachim Krägeloh, Stephan Maier, Frank Meyer, Kornelia Rennert, Thorsten Schmidt, Konrad Thannbichler

Photo credits

cover, 3 – 7 · www.yasmarinacircuit.ae
page 2 · www.andreaseifert.de
page 9 · www.jamiegreenracing.co.uk
pp. 14 – 15 · www.andreaseifert.de
page 16 · www.kuempellorenz.de
pp. 16 – 17 · www.andreaseifert.de
pp. 18 – 19 · Salzgitter Mannesmann Stahlhandel GmbH
page 22 · www.andreaseifert.de
back · www.yasmarinacircuit.ae

Salzgitter Mannesmann Line Pipe GmbH

Head Office
Siegen Works
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

Hamm Works
Kissinger Weg
59067 Hamm
Germany
Phone: +49 2381 420-701
Fax: +49 2381 420-719

Postal address:
Postfach 17 13
59061 Hamm
Germany

info@smlp.eu
www.smlp.eu

SALZGITTER
MANNESMANN
LINE PIPE
A Member of the Salzgitter Group