RÖCHLING

Project Report

New pickling line with Polystone® G blue B 100-RC

- High operational reliability and performance
- Pickling medium with up to 18 % nitric acid and 7 % hydrofluoric acid

Chemical Processing Industry

New pickling line with Polystone® G blue B 100-RC

Anyone who works with **aggressive chemical media** in industrial processes bears a **special responsibility**. Technically correct handling and application is decisive for the operational safety and the efficiency of processing plants. In short: the work is demanding and involves much responsibility. Andreas Nürnberger, industrial foreman, also knows this. The 57-year-old is responsible for environmental and energy management at Salzgitter Mannesmann Stainless Tubes Deutschland GmbH in Remscheid, Germany.

Production of seamless steel tubes

The company specialises in the manufacture of seamless steel tubes and offers one of the largest product portfolios in the world. The worldwide success story of Mannesmann-Röhrenwerke AG – today Salzgitter Mannesmann Stainless Tubes Germany – began with a patent application for the manufacture of seamless tubes filed in January 1885.

Up to 18 % nitric acid and 7 % hydrofluoric acid

Pickling the pipes is an essential step in the production process. Nürnberger: "After straightening, the drawing agent or scale residues are removed from the seamlessly pressed or drawn tubes in the pickling tank." Mannesmann Stainless Tubes uses an **aggressive chemical medium with up to 18 % nitric acid and up to 7 % hydrofluoric acid.** The operating temperature is up to 50 °C. As part of a team, Nürnberger is involved in the professional control of the pickling lines and always examines possibilities for optimisation. As a leading company, Mannesmann Stainless Tubes places very high demands on its products and processes. Aggressive chemical media are a particularly special challenge.

Goal: Longer service life

The pickling tank of an existing plant used to be made of glass-fibre reinforced plastic. Nürnberger explains: "Although the material offers the necessary chemical resistance, maintenance is time-consuming and costly. For repairs, the GRP must be glued; a process that takes time to dry and harden. Furthermore, sawing and grinding generate dust." Salzgitter Mannesmann was looking for an alternative to **increase the service life** of the new tank. Nürnberger gave this task to the apparatus manufacturer G&H Kunststofftechnik GmbH & Co. KG from Sprockhövel/Germany.

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Randolf Gödecke, Managing Director G&H Kunststofftechnik

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G&H Kunststofftechnik GmbH & Co. KG

Founded in 1998, the company is one of the leading specialists in special plastic construction. The key business areas include tank, pipeline and apparatus construction as well as ventilation technology. Since 2010, the subsidiary G&H Anlagenbau GmbH & Co. KG has been supplementing its comprehensive range of products and services, which has won over well-known companies in the chemical industry, in vehicle manufacturing, research, medical and semiconductor technology. At the location in Sprockhövel, it builds ultra-modern systems based on the latest construction technology, which are individually tailored to customer requirements.

Years of cooperation

It was not only the confidence in the chemical apparatus manufacturer's expertise that tipped the scales, but also "the fact that G&H has been rooted in plant engineering for years and the close proximity", says Nürnberger. Randolf Gödecke, Managing Director of G&H, says: "We like that Salzgitter Mannesmann is open to new ideas and has trusted our recommendations for years."

Capacity 25,000 litres

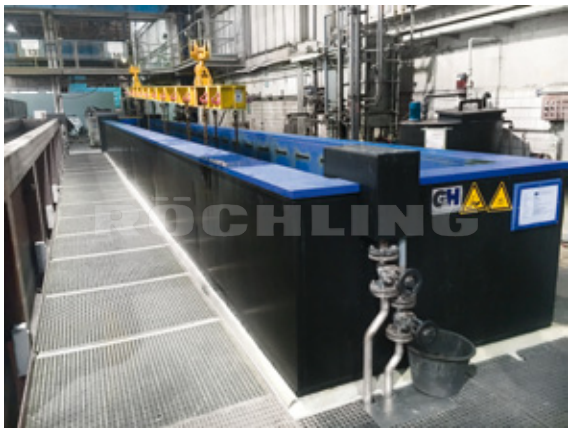
At Mannesmann, G&H familiarises itself with the task at hand. Via Autodesk Inventor, the team constructed a basin supported by a stainless steel frame with a length of almost **17 metres, a width of almost 2.5 metres and a capacity of 25,000 litres.** At the Sprockhövel site, G&H prefabricated the basin in two parts. It was finally assembled and welded at Mannesmann Stainless Tubes in Remscheid.

Interior cladding made from Polystone® G blue B 100-RC

G&H chose Polystone® G blue B 100-RC from Röchling Engineering Plastics in Haren/Germany as the interior cladding material for contact with the aggressive pickling medium. The plastic is a polyethylene with **excellent chemical resistance to chemical media** and high stress crack resistance – RC stands for **R**esistant to **C**rack. The plastic is used worldwide in process and storage tanks with media that cause stress cracking. Gödecke explains: "Our experience has shown that Polystone® G blue B 100-RC is very well suited for chemical apparatus engineering. The material is suitable for permanent contact with the aggressive nitric and hydrofluoric acids used at Mannesmann Stainless Tubes. The plastic thus contributes to the reliability and longer service life of the new pickling line." The material also offers high impact resistance at low outside temperatures. This is important because the tank is located in an unheated hall. "The tank is exposed to considerable temperature differences", says Nürnberger. G&H has used Polystone® G HD black from Röchling as the exterior cladding material. The plastic Polystone® P flex was used at the foot of the exterior cladding. The material combines very high elasticity with good chemical resistance and is therefore particularly suitable for sealing gaps in galvanic or steel pickling lines.

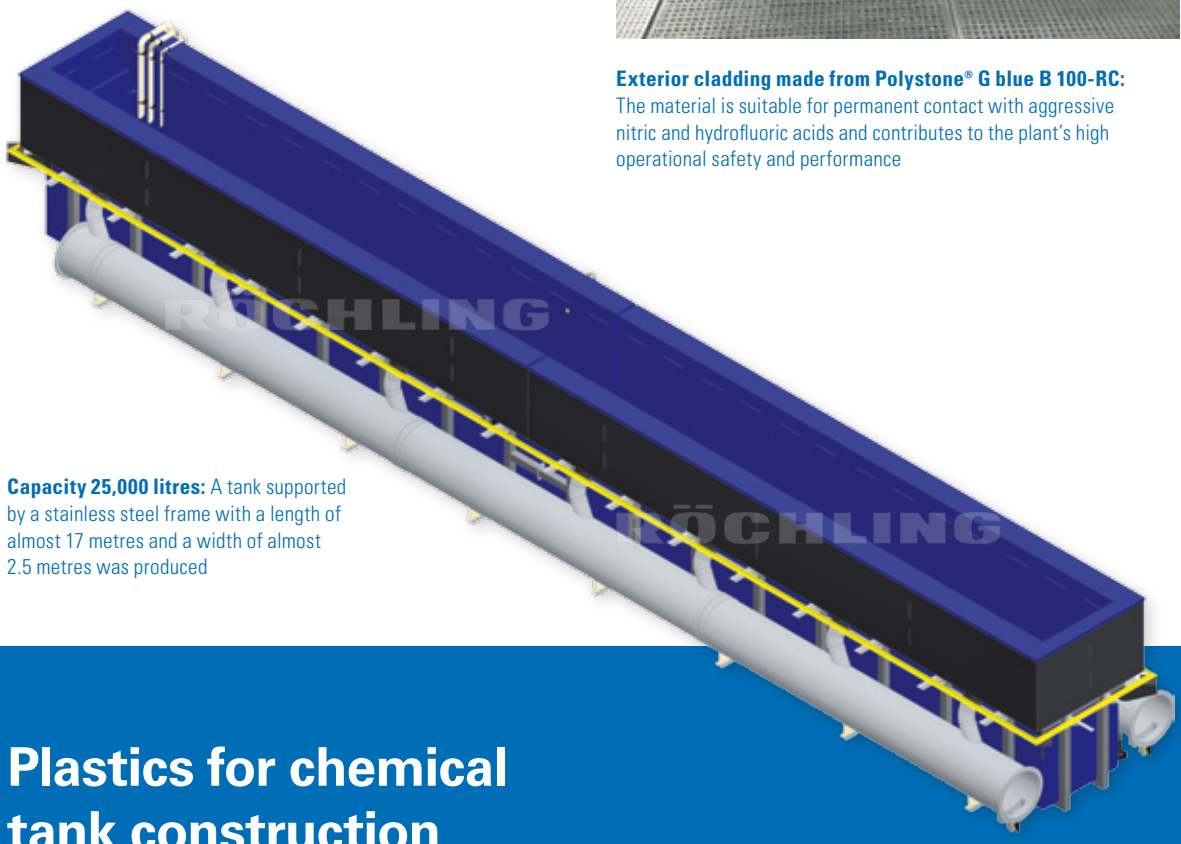
Fast commissioning

Thanks to their low weight and excellent weldability, the plastics were very easy to process. "The new pickling line was so easy to assemble and was quickly put into operation" says Gödecke.



Pickling line for seamless tubes at Mannesmann Stainless Tubes Deutschland GmbH in Remscheid/Germany: A pickling medium with up to 18 % nitric acid and 7 % hydrofluoric acid is used

Exterior cladding made from Polystone® G blue B 100-RC: The material is suitable for permanent contact with aggressive nitric and hydrofluoric acids and contributes to the plant's high operational safety and performance



Capacity 25,000 litres: A tank supported by a stainless steel frame with a length of almost 17 metres and a width of almost 2.5 metres was produced

Plastics for chemical tank construction

Röchling plastics have been in use for decades in the chemical processing industry as materials for installations and tanks. Röchling provides its customers with a complete installation, from sheet material, round rods and tubes, different welding rods and assists them in the selection of the right materials with expert advice. In addition, Röchling has extensive databases and many years of experience regarding chemical resistance and the successful use of thermoplastics and composites. The most important areas of use include tanks for the storage of liquids, galvanising systems, steel pickling systems, water treatment plants, exhaust-air cleaning plants and ventilation systems.

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Project overview

New pickling line with Polystone® G blue B 100-RC

Initial situation

Planning and manufacture of a pickling line for the production of seamless tubes at Salzgitter Mannesmann Stainless Tubes Deutschland GmbH.

- Dimension: 16,820 x 1,780 x 2,470 mm
- Capacity: 25,000 litres

Requirements

- Resistance to the **aggressive pickling medium with up to 18 % nitric acid and 7 % hydrofluoric acid**
- Simple processing and weldability

Material used

- Polystone® G blue B 100-RC
- Polystone® G HD black
- Polystone® P flex grey

Result

With its high resistance to aggressive chemical media, Polystone® G blue B 100-RC contributes to the reliability and service life of the new pickling line. Thanks to the simple processing, the system could be designed and put into operation very quickly.

Project partner

G&H Kunststofftechnik GmbH & Co. KG
Stennert 14 | 45549 Sprockhövel | Germany
www.gh-kunststofftechnik.de

Salzgitter Mannesmann Stainless Tubes Deutschland GmbH
Bahnstraße 61 | 42859 Remscheid | Germany
www.mannesmann-stainless-tubes.com

Röchling Engineering Plastics SE & Co. KG
Röchlingstr. 1 | 49733 Haren (Ems) | Germany
www.roechling.com

RÖCHLING

Röchling Engineering Plastics SE & Co. KG
Röchlingstr. 1
49733 Haren | Germany
Phone +49 5934 701-0
info@roechling-plastics.com

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