

The cast iron pipe project of the year: The Binz underwater pipeline



***What do cast iron pipes and the Titanic have in common?
One week in the hard life of working in application technology -
a very personal and tongue-in-cheek report by Stephan Hobohm***

With long johns, thick socks, bobble hat and raincoat all packed, the two spearheads of application technology at Buderus, Georgios Moutroupidis and Stephan Hobohm set off in the pouring rain to perform new heroic deeds on behalf of the company. This came to pass in the second week of October 2008. The destination of the arduous journey was the small town of Binz in the north east of the island of Rugia, the most exclusive seaside resort of its kind north of the Alps and west of the Urals.

But why the long journey?

Quite simple! Their ambition was to support the cast iron pipe project of the year with specialist words and deeds and to record it for posterity.

On arrival in Binz, the two were horrified to find that they had packed their long johns, thick socks, bobble hats and rain jackets unnecessarily. They should have



known – when angels travel, the weather simply has to be good. At 20°C, no wind and glorious blue skies, they threw on light work clothes of t-shirts, flip-flops and board shorts and went to work fresh and calm, footloose and fancy free.

Cast iron pipes on the beach

Directly on the long sandy beach, surrounded by thousands of elderly tourists, jellyfish and seagulls, was the building site – very centrally located right by the village centre.

And there they lay, our lovely ductile cast iron pipes, glinting in the autumn sun shining from the sky, eagerly waiting to be used for their designated purpose. In this case, that was and is to divert the excess water from the Schmachter See in the Binz back country approximately 400 m under the dune and the beach into the Baltic Sea and hence to rid the village of



a long-standing eyesore on the otherwise immaculate Binz beach.

Hitherto the water has been drained directly from the dune to the beach. However, the water was brown, due to organic constituents, giving the impression that this was sewage, prompting some dog owners and parents to curtail their darlings' play on this part of the beach. To avoid this in future, the community decided to build a drainage pipe directly into the sea.

Consequently Norddeutsche Rohrleitungsbau von Lübeck, an experienced company, was engaged to carry out the work using the best pipe in the world.

Thus, in the second week of September, the site was set up and the first pipes delivered. A total of 75 MDRA DN 1000 Zinc/Epoxy BLS® K10 pipes, or 450 metres, were produced and stored on the beach. A great deal of preparatory work was then done in the weeks that followed. This mainly consisted of digging a trench through the dune and the beach as

far as the waterline. But a trench also had to be dug under water. A floating dredger was used for this, which was essentially just a large boat with a perfectly normal excavator on it. This floating dredger dug a trench approx. three metres wide and 400 metres long in the sandy floor of the Baltic Sea. Another ship was then supposed to drive piles into this trench every 20 metres, which were supposed to be used later to align the cast iron pipe. However this never happened because the ship in question was unable to sail across the Baltic from Denmark to Rugia because of a storm. Consequently, the construction sequence was altered because, apart from the missing alignment piles, a pillar with a deflection pulley, which was supposed to pull in the pipe later, also could not be positioned.

Cast iron pipes on standby

So it's 6th October, 7 o'clock in the morning, the sun is just rising over the Baltic, the sea is calm, stomachs are full and our

two application technology heroes are on site to fly the flag for Buderus Giesserei Wetzlar, and not just figuratively. As has already been mentioned, there were no pillars, piles or any other everyday necessities for pulling in pipes. So it was time to have a rethink and pitch in. The circumstances lent themselves to pushing the pipe in.

Pushing it in? How? Where? What do you mean?

What we have failed to mention so far was the crucial part of the plan, to float the pipe in the Baltic while it was being pulled in – or rather pushed in now. "But will it even work?" This question was on everyone's lips, not just the many spectators along the site fence on Binz beach. "Yes, of course it will work! The Titanic was made of iron and could float as long as it was watertight. So it will work fine with a ductile cast iron pipe," was the answer that was often advanced.





The physics of cast iron pipes

This claim can be substantiated with the aid of physics.

Each of the MDRA DN 1000 K10 BLS® Zinc/Epoxy cast iron pipes described above has a mass of approx. 2600 kg. That is equivalent to 433 kg/m, which in turn corresponds to a weight and hence a buoyancy of 4.3 kN/m. Because of the pipe's d1 dimension (external shaft diameter) of 1048 mm, which has been set in stone since the beginning, and the water density of approaching 10 kN/m³, the expected buoyancy of the pipe can easily be ascertained. According to Adam Riese this comes out at 8.6 kN/m. Ultimately this means that a cast iron pipe of the dimensions used can float providing it is filled with air. You could even put 4 overweight people per metre on the pipe and they would only get their feet wet -

unless they were wearing rubber boots, when even their feet would stay dry.

So, to cut a long story short, a cast iron pipe can float and is therefore ideal for this project.

Cast iron pipes on the Baltic

Back to 6th October and the beach. Still great weather and even slightly sunburnt noses.

Sliding in the pipes begins. Hesitantly at first, but then more and more quickly; the string of pipes moves towards the Swedish coast, i.e. northwards, away from the shore, at a speed of around 20 minutes per pipe.

The construction company's preliminary work must have been good to achieve such an excellent installation speed. A platform had been set up on the beach to which rollers were fitted. Here the pipes

were laid down, pulled together, locked and slid into the sea. Daily productivity of up to 25 pipes was achieved, as a result of which all 68 pipes that were intended to float were in the water by the morning of 9th October.

In the meantime, the ship ordered for driving in the piles had now finally arrived from Denmark and could do its job. In addition to the piles for alignment and for pulling the string of pipes that have already been described, another ten piles were driven into the discharge area of the pipeline. These were then cut off by a diver just above the floor of the icy Baltic and fitted with what are known as pipe saddles.

Cast iron pipes in the Baltic

Decision time had now come. It was now Saturday, the weather was still glorious, so it was possible to start manoeuvring





and sinking the pipe into its final position. To do this, the pipeline was slowly filled with seawater until it gradually began to sink. A diver monitored it to make sure it stayed in the right position.

And by Saturday evening the pipeline was lying where it was supposed to be – on the floor of the Baltic. Over the next few days the pipes were secured to the pipe saddles and the section that had been floated out was connected to the string laid under the beach.

However, our two brave application technology heroes were not there to follow this last step live. As the pipeline sank, the two bade farewell to Binz and sallied forth into the wide blue yonder of the international cast iron pipe market, onwards and upwards to new sites and challenges.



Binz is the largest seaside resort on the island of Rugia and is situated on one of the most beautiful bay on the island, the Prorer Wiek. Surrounded by the extensive woodland of the Schmale Heide (the "narrow heath") and Granitz, the town extends to the banks of the Schmachter See in the west whilst the east faces the Baltic. Binz is famous not only for its wonderful location and mild climate, but primarily for its bathing architecture, which is more splendid than in any other seaside resort on the island. The playful ornaments and rosettes on the villas and the little towers and bay windows have become synonymous with Binz.



The first spa hotel was built in 1890 and the beach promenade was built five years later. In the same year, the railway line from Putbus to Binz was built, along which the narrow gauge steam railway the Rügensche Bäderbahn, known as „Rasender Roland“ now runs.

Binz was connected to the drinking water supply in 1903 and a year later an electric power station was built. International travellers were soon drawn to the former fishing village which had now become an attractive seaside resort.

During the GDR era, Binz became a traditional „workers' seaside resort“, but reverted relatively quickly, and at great expense, to its former glory after reunification. The new 370m long pier was opened in May 1994. The spa gardens were redesigned in the early years of the 21st century and the „Park der Sinne“ (park for the senses) on the Schmachter See was opened. This lake, which originates from the ice age, has a surface area of approx. 118 hectares and is only one to two metres deep, even in the middle. The Ahlbeck drainage ditch, which was cased in the 1950s, connects it to the Baltic. The lake is environmentally unstable because of the sewage discharged from the treatment plant and the increased ingress of nutrients from agriculture. After many years of preparatory work, a unique renaturation process was launched in 2004 to clarify the water again and hence to preserve the habitat of the indigenous animals and plants. Never before had a lake of this size been „restored“. And now – thanks to Buderus' ductile cast iron pipes – Binz also has a perfectly maintained beach!