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**European Association for  
Ductile Iron Pipe Systems**

**Fachgemeinschaft Guss-Rohrsysteme**

# NEWSLETTER

10/2016

Dear Readers,

In this, the last Newsletter of 2016, I am reporting on projects in Austria, Switzerland and Norway. Ductile cast iron is used in a variety of ways. But pipes, fittings and valves are always the key element in the thinking here. With this in mind, one article looks at the further development of renewable energies. Robust and operationally reliable ductile iron pipes are given priority for use in power plant pipelines. Security of supply for drinking water takes centre position in the second piece about a major project in Switzerland which, naturally, includes the installation of ductile iron pipes as the transport pipelines from newly developed drinking water extraction areas. In the third contribution I am reporting on another area where ductile iron pipes are used. Ductile driven piles have been used as foundation elements for around 30 years. You can see what these piles look like after 30 years of service in article no. 3.



Dear Readers, we would like to close by wishing you a successful start to 2017.

Have an enjoyable and stimulating read  
Sincerely yours

Christoph Bennerscheidt

## Always topically, always informs

The online newsletter informs deciders and technical experts about cutting-edge pipeline projects in Europe as well as about the diverse activities of EADIPS®/FGR®.

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### Imprint

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# 750 m of ductile iron pipes for the turbine pipeline

## Storelvi hydropower station



Installation of ductile iron pipes as the turbine pipeline for the Storelvi hydropower station

In Ullensvang in the Norwegian province of Hordaland, with Bergen as its capital city, Sunnhordaland Kraftlag (SKL) is building a new hydropower station. Ductile iron pipes were used for part of the turbine pipeline.

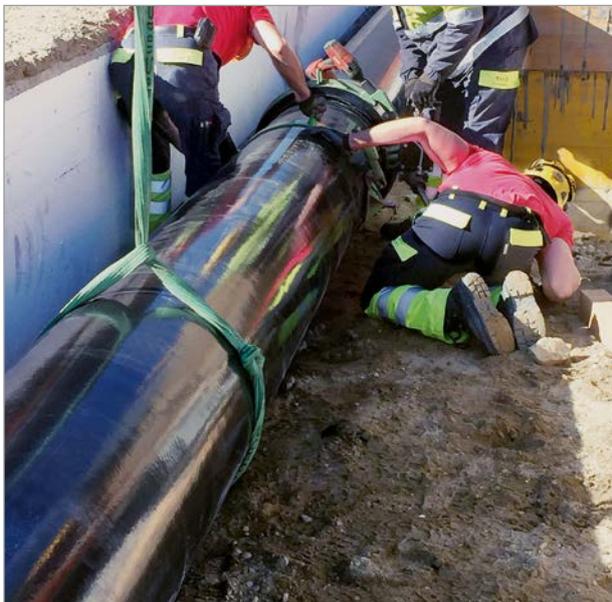
For the new hydroelectric power station, water from the Storelvi, which flows into a branch of the Hardanger Fjord, is supplied to the turbines. The major part of the region around Ullensvang is located within the Hardangervidda national park, Europe's largest mountain plateau with the Hårteigen as its highest point at 1,690 m. In its top section running from the water catchment area, part of the 1,500 m long turbine pipeline is laid in a tunnel driven for this purpose. The pipeline in the 750 m long lower section consists of DN 600 and DN 500 ductile iron pipes, in part with BLS® push-in joints. While the first 200 m from the powerhouse run through relatively level ground, some impressively steep slopes had to be coped with towards the tunnel opening.

On this section, DN 500 pipes with BLS® push-in joints were used. The turbine pipeline has a head of 650 m and is designed to a pressure of approximately 64 bar. Once completed, the Storelvi hydropower plant will deliver around 14 GWh of power.

# New drinking water transport pipelines for Bellinzona in the Swiss Canton of Ticino



The route of the drinking water pipeline between the Ticino River in the Swiss Canton of the same name and the A2.



The route of the drinking water pipeline between the Ticino River in the Swiss Canton of the same name and the A2.

Bellinzona is the capital and, after Lugano, the second largest city in the Canton of Ticino (Switzerland). For the past 6 years Aziende Municipalizzate Bellinzona AMB, the utility company for the city of Bellinzona, has been implementing the stages of a major project which will ensure a secure, top quality supply of drinking water for the city of Bellinzona and the suburbs of Sementina, Monte Carasso, Gnosca and Gorduno for the coming decades. The philosophy behind the project is the reliable operation of existing and new productive wells and sources. Facilities with insufficient capacity or those located in densely built-up risk areas are to be abandoned.

Because of this, 5 existing wells close to the football stadium in the centre of Bellinzona will be taken out of operation. The volumes of drinking water lost in this way will be provided by the construction of 2 new wells in a groundwater protection zone in the districts of Gorduno and Gnosca. These new water resources will be integrated into the drinking water distribution network of the participating municipalities. The total investment for this future-oriented project amounts to more than 20 million CHF. It is planned that this intercommunal water supply system will be put into operation in the middle of 2017.

For years now, AMB Bellinzona has been putting its trust in vonRoll ECOPUR ductile iron pipes with integral polyurethane (PUR) lining to EN 15655 and coating to EN 15189 along with ECOFIT fittings with epoxy coating. Because of the outstanding resistance of the PUR lining to the "soft" water of Ticino and because of the electrically insulating protection system of the PUR coating, ECOPUR pipes are the ideal solution in all installation situations and they offer the highest level of investment protection.

The route of the 5th stage of the pipeline currently under construction with ECOPUR DN 500 ductile iron pipes runs through an in-situ concrete canal alongside the River Ticino for a length of approximately 3 km, parallel to the A2 motorway. The entire section of pipeline is secured with HYDROTIGHT flexible push-in joints.

In the project as a whole, the following types of ECOPUR pipe will be used in the participating communes:

- City of Bellinzona: DN 300/400/500 – length 5.8 km
- District of Gnosca: DN 100 – length 1.5 km
- District of Gorduno: DN 100/150 – length 0.5 km
- Districts of Monte Carasso and Sementina:
  - DN 150/200 – length 1.4 km
  - DN 200/250 – length 1.3 km

## 30 years of ductile cast iron driven piles

On the occasion of a technology transfer (licence agreement) between the companies Tiroler Röhren- und Metallwerke AG and AB Gustavsberg in 1986, the ductile driven pile came to Austria, where its history of success began. 7 million metres have been produced in 30 years which have been used across the world.

If there was still scepticism and misunderstanding among the associates about the subject of pile driving at the start, these days the system has become indispensable in Austria. Spheroidal graphite cast iron, otherwise known as ductile cast iron, was and is the key to this success. The material, which was industrialised in the early 1960's, offers everything needed by a driven pile system: ductility, impact strength and corrosion resistance.

In addition to the material advantages mentioned above, liquid iron can be used to produce push-in joints with a shaft in a single casting process. The PLUG&DRIVE® joint produced in this way is bending resistant and friction-locked. It can be assembled without special tools or welding work and the length of the piles can be adapted to requirements on site. This technical performance of ductile cast iron driven piles offers the highest security.

In addition to this, the ease of handling offers economic advantages in the form of high daily outputs with low material and machine costs and the proven longevity.

The ecological advantages of cast iron driven piles are environmental compatibility and the 100 % recyclability, which will be described below.

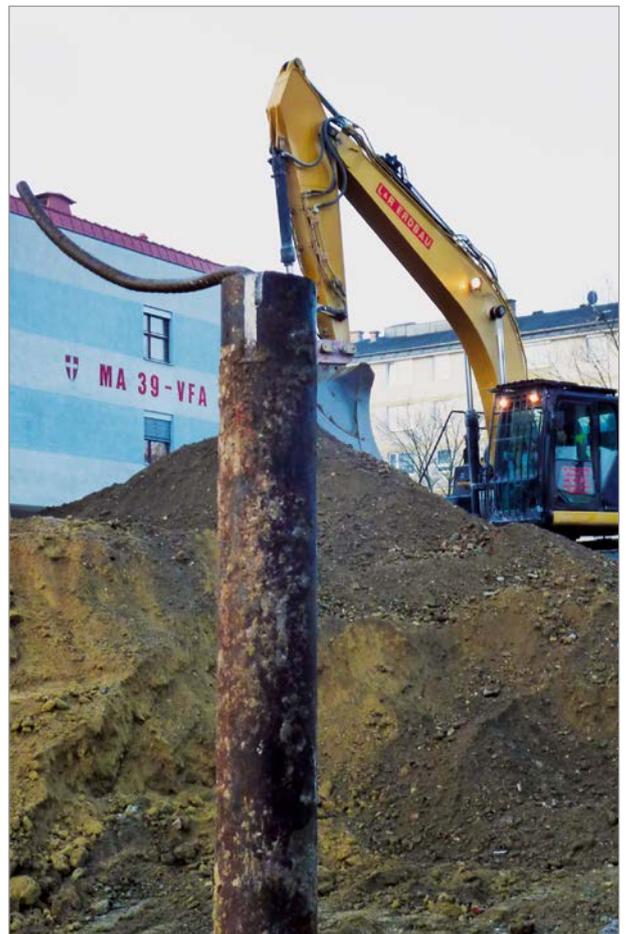
Both the concept of recycling and the longevity of the material take us on to what is currently the largest municipal building project by the city of Vienna. For about 60 million euros, the testing, research and certification institute of the city of Vienna (MA 39) is currently being extended and rebuilt. The MA 39 was established in 1879 and it is the oldest testing institute in Austria in the field of testing building materials.

In the context of the reconstruction work and for the purpose of expansion, an existing materials testing hall has been demolished; it was here, close on 30 years ago, that the ductile cast iron pile driving system was used for the first time.

30 years later, these same cast iron driven piles were released from beneath the foundations and pulled out by hydraulic excavator.



Cast iron driven piles (grey) in store at Tiroler Rohre GmbH



Cast iron driven pile revealed after 30 years

The result was very gratifying. No traces of corrosion or resulting signs of fatigue were detected on the three piles exposed and extracted. In fact the TRM trade-name sprayed on at the time was still visible. A slight deformation of one pile, due to the high impact energy when driving the pile, had no effect on the functionality of the system and provided eloquent testimony to the material property of ductility.

To come back to the concept of ecological advantages mentioned: the cast iron piles extracted were able to be put to a new production process one-for-one as valuable raw material for smelting – new for old or, in other words:



The PLUG & DRIVE® joint of a cast iron driven pile extracted after 30 years

**“I once was a ductile cast iron driven pile and might also become a ductile cast iron driven pile once again!”**

The example impressively underlines the concept of resource efficiency and the recycling economy with a low level of pollution by fossil fuels and the associated CO<sub>2</sub> emissions.