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Fachgemeinschaft Guss-Rohrsysteme

NEWSLETTER

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Dear Readers,

In the winters of the 1980's when snowfall was low, the need grew for snow-making facilities in the Alps. Since 1986, robust, reliable and easy-to-handle ductile iron pipe systems have been used for this and the extension and renovation of the snow-making equipment in the Alps has been forging ahead. This is also the case in Seefeld in order to guarantee snow for the Nordic Ski World Championships in 2019 and in Ischgl, where ductile iron pipe systems have been used for building the new storage reservoir.

When it comes to producing power from wastewater, the height difference of a wastewater pressure pipeline can also be used to advantage. In future, a small hydropower plant will use a turbine to convert the flow of wastewater from the municipality of Zumikon (Switzerland) into power. Shutoff valves in drinking water networks are replaced regularly. When doing this, it is advisable to take any changes in the water supplier's operating requirements into account for the design of the valve. So it was in the case of a shutoff valve for Hamburg Wasser, where air-venting was ensured by the installation of two underground hydrants, before and after the shutoff valve.

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Christoph Bennerscheidt

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22nd Pipe Construction Congress in Weimar

We look forward to your visit to give us the opportunity to talk together about the latest applications of ductile iron pipe systems.

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Doncaster-Platz 5 · 45699 Herten/Germany · Phone: +49 (0)23 66/99 43 905 · Fax: +49 (0)23 66/99 43 906 · E-mail: info@eadips.org · www.eadips.org
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More than 30 years` experience with ductile iron pipe systems for snow-making equipment

In the winters of the 1980's when snowfall was low, the need grew for snow-making facilities in the Alps. The operators and planners of snow-making equipment were in search of a robust, reliable and easy-to-handle piping system which could withstand pressures of up to 100 bars without problems. These criteria were – and still are today – met by ductile iron pipe systems with restrained push-in joints. Tiroler Rohre GmbH ventured into the area of snow-making equipment as early as 1986. But even now, 30 years later, the extension and renovation of the snow-making equipment in the Alps is still forging ahead. This is illustrated by two current projects in the districts of Seefeld and Ischgl in the Tyrol, where ductile iron pipes with BLS®/VRS®-T socket joints from Tiroler Rohre GmbH are being used.

Guaranteed snow for the Nordic Ski World Championships in 2019

It was in 2014 that Seefeld in the Tyrol was named – for the fourth time – as the venue for the FIS Nordic Ski World Championships (FIS – Fédération Internationale de Ski). The snow-making equipment is already being expanded so that, in just two years time, snow is guaranteed for the great event. Particularly impressive here is the construction of a new snow-making reservoir on the Gschwandtkopf, which forms the basis for a seamless cover of snow for the entire cross-country skiing trail. For filling the storage reservoir, for the reservoir piping system and for distributing the water to the snow cannons, around 3,300 m of ductile iron pipes in nominal sizes DN 80, DN 200, DN 250 and DN 400 from Tiroler Rohre GmbH are used. In June 2017, construction work was started on the conversion and extension of the infrastructure of the snow-making equipment. The construction project will be completed in the next few months in order to be able to offer the athletes a taste of what is to come in the 2019 World Championships at the forthcoming cross-country skiing events such as the FIS Race, the Kaiser Maximilian Lauf, Austrian Championships and the "PRE WSC".

Figure 1:
Filling and take-off pipelines to the future pumping station

Figure 2:
Filling and take-off pipelines to the snow-making reservoir

New Viderböden storage reservoir in Ischgl

In the ski resort of Ischgl, more than 2,300 m above sea level, work was started on the new Viderböden storage reservoir in May. The construction site is also referred to as a "heart transplant" as the very heart of the snow-making system – the reservoir lake – has to be completely relocated.

Figure 3:
Panoramic view of the major construction site around the new Viderböden storage reservoir in the ski resort of Ischgl, Tyrol

The location of the existing reservoir, including the upper and above all the lower slope, is constantly moving and the authorities withdrew their approval for its operation as from the end of the 2016/17 winter season, which is why it was necessary to look around for a new location. This had to be as close as possible to the former site so that the pipelines could be connected up without having to run long distances and so that the water could be taken from there and supplied to the widely branching network of the existing system without undue excavation work.

Figure 4:
Installation of the filling and take-off pipelines in high-Alpine country

The connection of the new central location to the existing snow-making system will be made possible with pipes from Tiroler Rohre GmbH in nominal sizes DN 80, DN 150, DN 200, DN 250, DN 300 and DN 400. The "Operation" costing around € 4.5 million should be completed in the next few months so that the snow-making equipment is functioning and ready to

When wastewater can produce power

In future, wastewater will flow from the municipality of Zumikon down into the wastewater treatment plant of the municipality of Küsnacht on Lake Zurich. The plan is to use the height difference of 180 m to produce alternative energy in a small hydropower plant via a turbine. The wastewater from Zumikon is taken to the power plant by a pressure pipeline.

The approx. 3 km long pressure pipeline runs partly through a landscape which is difficult to access and geologically challenging; in large sections it has been installed using an underground driving process, the directional drilling technique. The high tensile forces expected during the installation of the pipes on account of the geological conditions as well as the high internal pressures under the operation of the wastewater pressure pipeline required the use of a robust, flexible and easy-to-handle pipe system. Based on experience with similar projects, the client (the municipalities of Zumikon and Küsnacht) decided in favour of ductile iron pipes from Duktus/Hagenbucher with BLS® restrained push-in joints, cement mortar coating and a cement mortar lining based on high-alumina cement.

In total, 2,918 m of DN 300 ductile iron pipes with restrained push-in joints, type BLS® with cement mortar coating and cement mortar lining were installed. Of these, two sections with lengths of 748 m and 655 m were laid using the directional drilling technique and the remaining 1515 m with the open trench technique.

Figure 1:
Installation of ductile iron pipes with cement mortar coating and BLS® push-in joints in the central section using the open trench technique

Figure 2:
Assembling the pipes with socket guards before pulling in

Figure 3:
Immersing the wastewater pipes with cement mortar coating and BLS® push-in joints into the pre-drilled tunnel

Figure 4:
Upsizing head with the first pipe in the target pit

A special solution for Hamburg Wasser: longer-design shutoff valve with air-venting

Fresh drinking water for two million people

5,400 km drinking water pipe network

Hamburg Wasser operates a drinking water pipeline network which is around 5,400 km long. Some 900 km of pipelines have a nominal size greater than DN 300. The number of shutoff valves is correspondingly large, and they need to be replaced regularly. During the course of construction, it is now standard practice to equip valves from DN 400 with a bypass which can be shut off. These bypasses allow pipelines to be filled and drained without any sudden rise or fall in pressure. Another aspect is to enable air to be discharged during the filling process (venting).

During market research into double-eccentric shutoff valves, the attention of experts from Hamburg's West network operation was drawn to the longer-design valves from Düker. When replacing old gate valves, these frequently made a 1:1 exchange possible.

As part of a visit to the valve production centre in Laufach, the application of a DN 600 valve shortly to be replaced was discussed. Because the valve is located at a high point in the pipe network, the plan was to install a device for venting the pipeline at the same time as the replacement work.

Individually tailored solution

The discussion finally produced the following special solution: A DN 600 shutoff valve for a nominal pressure of 16 bar (PN 16) in the longer design (R 15) with two DN 80 block flanges on top to provide ventilation before and after the valve seat. The old shutoff valve was replaced by this special solution (Figure 1) and the venting was ensured by the installation of two underground hydrants before and after the shutoff valve (Figure 2).

Figure 1:
A view down onto the shutoff valve with block flanges on top

Figure 2:
Installed shutoff valve with two underground hydrants

During operation, this compact system allows
- filling and emptying pipelines without pressure shock via a hydrant bridge
- manual aeration and venting via the standpipe
- venting by the use of hydrant air vents.

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