



**EADIPS®**  
**FGR®**

**European Association for  
Ductile Iron Pipe Systems**

**Fachgemeinschaft Guss-Rohrsysteme**

# NEWSLETTER

02/2017

Dear Readers,

Again and again, durability under high operating pressures proves to be a reason for using ductile iron pipe systems. This is why Kreiswerke Cham opted for ductile iron pipes when relocating a transport pipeline with an operating pressure of 30 bars.

The article about the construction of a supply pipeline in the Swiss village of Villmergen, known as the site of the two historic battles in the religious wars of the Swiss Federation (the "battles of Villmergen") in 1656 and 1712, again stresses this concept. Valves and fittings in ductile cast iron provide the ventilation for a ductile cast iron transport pipeline in the area of a culvert here. In another contribution, the Newsletter addresses a perennial issue in the field of sewage pipelines: root penetration and push-in joints. The diffusion tightness of the pipe system plays a decisive role in demonstrating the resistance of cast iron pipe systems against root penetration. Finally, I would like to remind you of the Wasser Berlin 2017 exhibition, taking place at the end of March 2017. There you will be able to find all you need to know about the performance capabilities of ductile iron pipe systems, both in the exhibition halls and at showcase construction sites in the city area of Berlin.

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®.

Registration for the newsletter:

[eadips.org/newsletter-e/](http://eadips.org/newsletter-e/)

### Imprint

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# Relocation of a water supply pipeline at Roding (Upper Palatinate)

Federal highway 85 connects district capital Cham westwards with Schwandorf and Roding and the A 93 motorway. In order to improve the transport links of the entire district of Cham and to increase traffic safety, Federal highway 85 is being extended. In the course of this project a southern bypass is being constructed for the area of Neubäu am See.

The “Roding” water transport pipeline between the pumping station at Neubäu am See and the Reichenbach elevated tank therefore had to be relocated. This pipeline belongs to the Kreiswerke Cham, a utility company with its administrative and operating headquarters for water supply in Neubäu am See, an area of the town of Roding, and it supplies around 40,000 inhabitants of the Old District of Roding and a few neighbouring communities in the Districts of Schwandorf and Regensburg with drinking water. The part of the supply pipeline affected by the relocation operates at a pressure of 30 bars. In total, 348 m of ductile iron pipes in nominal DN 400 were installed. The pipes were supplied with BLS®/VRS®-T restrained push-in joints and a cement mortar coating (Figure 1). The installation of the durable piping system in the pipe trench with the assembly device and locking elements for the BLS®/VRS®-T push-in joint is shown in Figure 2.



Fig. 1:  
Ductile iron pipes with the BLS®/VRS®-T push-in joint before installation



Fig. 2:  
Locking elements (black and red) shortly before installation in the BLS®/VRS®-T restrained push-in joint

Two important reasons prompted Kreiswerke Cham to decide in favour of this ductile iron pipe system:

1. The high operating pressures of 30 bars
2. The long working life of cast iron pipes with cement mortar coating.

Work on the pipeline commenced in mid-July 2016. Not least because of the ease of assembly of the push-in joints, the new section was able to be put into operation as early as the end of August 2016.

# Stream renaturation in Villmergen (Canton of Aargau)

## Relocation of a DN 400 transport pipeline

The community of Villmergen lies in the South-East of the Swiss Canton of Aargau and is particularly famous as the site of the historic battles in the two religious wars of the Swiss Federation (the "battles of Villmergen") in 1656 and 1712.

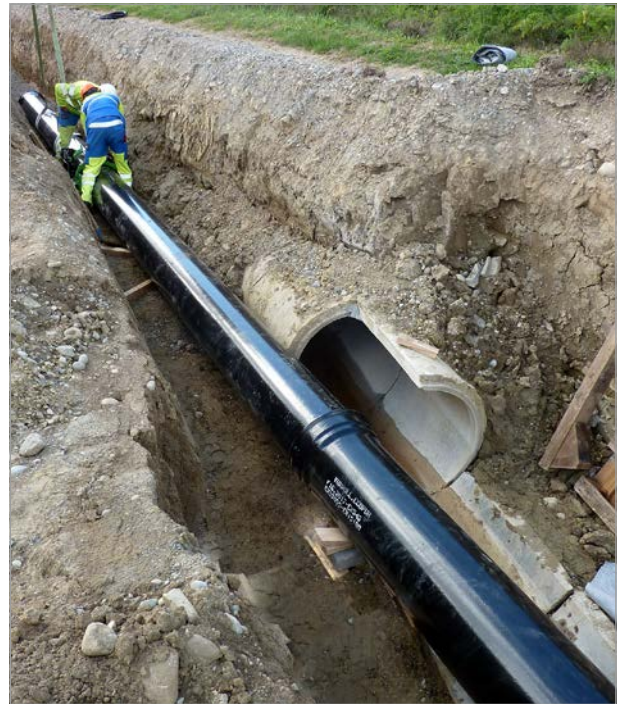
Since 1895 Villmergen has had access to a central water supply. Investigations in 1945 revealed that a water conduit made of clay pipes existed in Villmergen right back in Roman times.

In the 1990's, severe weather meant that the streams in Villmergen burst their banks on a number of occasions, causing damage amounting to millions. A master plan for flood protection developed in 2001 was the basis for a project to restore the Trybach stream to its natural state. Until then it was routed through a concrete pipe which led to flooding in periods of heavy rain as there was no natural outlet for the volumes of water. Opening up the Trybach and relocating the bed of the stream should enlarge its run-off profile. At the same time the intention is to achieve an almost naturally flowing stream once again.

In connection with opening up the stream, it was necessary to relocate an existing DN 250 transport pipeline, because otherwise it would run underneath the new streambed. At the same time the nominal size of the pipeline from the pumping station to be relocated was increased to DN 400 for capacity reasons.

For the construction project as a whole, more than 200 m of ductile iron pipe of the vonRoll ECOPUR DN 400 type with integral polyurethane (PUR) coating to EN 545 and epoxy-coated vonRoll ECOFIT fittings to GSK/RAL - GZ 662 were used. All the push-in joints were restrained with the HYDROTIGHT thrust resistance system.

A particular factor in the planning and execution of the relocation of the pipeline was a culvert for crossing the new streambed. The necessary ventilation at the two high points of the pipeline were achieved with two vonRoll VARIO 2.0 underground hydrants, whereby a simple telescopic system allows a variable setting of the definitive installation height.



DN 400 transport pipeline: installation of ductile iron pipes – crossing of the stream to be relocated in the concrete pipe



High point with ventilation consisting of a vonRoll VARIO 2.0 underground hydrant and a all flanged tee

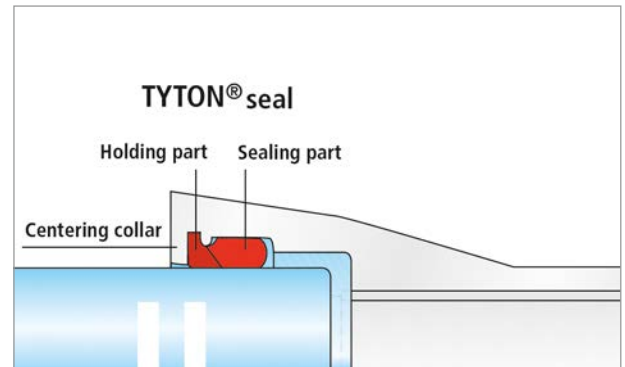
## Ductile iron pipe systems:

# Resistance to root penetration

“Root penetration in sewers” is known to be an obstacle to flow from the camera inspections regularly carried out inside piping systems. In private drains, root penetration often only becomes noticeable when blockages and backing up occur, along with the resulting consequences. In public sewage systems root penetration is one of the most frequent causes of damage. But in both private drains and public sewer systems these sections of pipelines are considered not to be tight.



Roots at a depth of 7.00 m, which have grown to this depth because of the good oxygen supply.  
Source: Schmiedener, H.



DIN 28603: TYTON® push-in joint

The availability of oxygen in the ground has a major influence on the way that roots spread. All vegetable organisms need oxygen to maintain their metabolism. The sealing-over of the ground in urban areas greatly limits the level to which oxygen can get into the soil. Sewers are usually operated as gravity pipelines and sufficiently ventilated via maintenance and inspection openings (manholes). The major part of the pipeline is filled with air. With casting compound, shrinkage can cause cracks to appear in the casting material. In this way, the oxygen contained in the air can get into the area surrounding pipes and pipe joints in the soil. When planning sewage systems, little attention is paid to the gas permeability of pipes and pipe joints. However, even with newly laid wastewater pipes, this can favour the growth of roots. With pipe materials, which are not gas-tight, oxygen can leak out even when the pipelines are intact. According to the oxygen model, roots grow towards the source of oxygen and so find the pipe joint. This model (oxytropism) is supported by the results of Porterfield, D. M. and Musgrave, M. E. Seedling roots of peas (*Pisum sativum* L.) follow an oxygen gradient in the direction of the higher O<sub>2</sub> concentration.

The contact pressures between the spigot end and the elastomeric seal of ductile iron pipe systems can demonstrably be far greater than the pressures exerted by tree roots. In addition, ductile iron pipe systems are diffusion-tight, meaning that the oxygen supply from the pipe system to the pore space in the backfilling of the pipe trench can be excluded. Against this background, it has been possible to work out a process for determining the root penetration resistance of push-in joints in ductile iron pipe systems on the basis of establishing long-term tightness behaviour. The results of these measurements, extrapolated over a 100-year period of use, show that the push-in joints of ductile iron pipe systems to DIN 28603 have long-term resistance against root penetration.

The technique for testing resistance to root penetration has been published as [EADIPS FGR Norm 76](#) erschienen. The background details to this are described in the article entitled “Root resistance of ductile iron pipe joints” in [Volume 51 DUCTILE IRON PIPE SYSTEMS](#) detailliert dargestellt.

The long-term sealing performance of TYTON® push-in joints were determined by the Institut für Rohrleitungsbau (iro), Oldenburg. The results are described in [test report No. G 32 980](#).

# Wasser Berlin International 2017

Member companies and EADIPS are exhibiting



**WASSER BERLIN  
INTERNATIONAL**

Fachmesse und Kongress  
für die Wasserwirtschaft

**28. – 31. März 2017**

From 28.03.2017 until 31.03.2017 the Wasser Berlin International 2017 exhibition will be taking place with the participation of EADIPS. We warmly invite you to visit the **EADIPS shared stand 319 in Hall 1.2.**

Member companies Düker GmbH, Duktus (Wetzlar) GmbH & Co. KG and vonRoll hydro (Deutschland) GmbH as well as EADIPS will warmly welcome you to Berlin. We are looking forward to your visit! We will be happy to answer your questions about ductile iron pipe systems, consisting of pipes, fittings and valves, on the exhibition stand.

But, outside the exhibition halls, as a visitor to the fair you will also be able to get some first-hand experience. It is traditional for Berliner Wasserbetriebe (BWB) to offer a **Showcase on Water**. On a tour of pipeline construction sites in Berlin there is an opportunity to see some innovative and environmentally friendly pipeline construction techniques. For example, on 30.03.2017 you can directly experience the use of ductile iron pipes with BLS®/VRS®-T push-in joints and cement mortar coating at the exhibition in Kaskelstraße in the Lichtenberg district. There they will be replacing drinking water pipes using the press-pull technique developed by Berliner Wasserbetriebe.



Press-pull technique: traction unit and thrust block