



EADIPS®
FGR®

**European Association for
Ductile Iron Pipe Systems**

Fachgemeinschaft Guss-Rohrsysteme

NEWSLETTER

02/2019

Dear Readers,

most components of ductile iron pipe systems in water distribution networks are installed underground and form an invisible network. In public areas it is accessible on the surface via hydrants, e.g. for the extraction of extinguishing water, for the ventilation of pipelines or for flushing. This issue of the EADIPS Newsletter provides an insight into the different designs of hydrants.



In other locations, valves are installed easily accessible; this is the case at the Sindelfingen waterworks. According to its corporate philosophy „Think globally - act locally“, ecological considerations are an important part of the strategy concept of Stadtwerke Sindelfingen. This is why butterfly valves and adapters and extension pieces in pipelines as well as ventilation valves on modern single-layer filters guarantee the safe operation of three different systems for drinking water treatment.

The increase in congestion in the Schaffhausen region led to the construction of the Galgenbuck Tunnel, which crosses the community of Neuhaus am Rheinfall in a wide arc over a total distance of 1,138 m. Such projects are no longer conceivable without a functioning extinguishing water supply. Water pipes and hydrants made of ductile cast iron are the first choice in these cases. Details on the installation of these components in the service duct below the carriageways are described in this article.

Have an enjoyable and stimulating read

Sincerely yours

Christoph Bennerscheidt

Always topical, always informed

The online Newsletter published periodically provides professionals in the field with up-to-date information about interesting European pipeline projects as well as the many and varied activities of EADIPS®/FGR®.

Subscribe to the Newsletter:

eadips.org/newsletter

Imprint

Issued by/Copyright: EADIPS®/FGR® European Association for Ductile Iron Pipe Systems/ Fachgemeinschaft Guss-Rohrsysteme e. V.
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
Production: schneider.media

Hydrants made of cast iron with spheroidal graphite

Hydrants are **water supply network** shut-off devices that enable fire brigades, road maintenance companies and street cleaning companies, among others, to directly withdraw water from the public **water supply network**. Hydrants are also used to flush and ventilate pipe networks. A distinction is made between underground and pillar hydrants. **Pillar hydrants** are preferable for fire-fighting purposes, as they are ready for operation, easy to find and accessible at all times. In densely built-up areas and in narrow streets, **underground hydrants** marked with signs are used. The construction, handling, maintenance and operational safety of **hydrants made of cast iron with spheroidal graphite** must meet high requirements, because the large number of operators requires different qualifications.



Industrial hydrant for extinguishing water supply on industrial premises

Materials and coatings of hydrants

Valve shell parts of the **hydrants** are generally constructed with **spheroidal graphite of cast iron** and steel. Other materials are also permitted, e.g. aluminium upper parts are available. PUR (polyurethane) and EPDM (ethylene propylene diene monomer) are used as materials for shut-off elements. The **epoxy coating** of valves has meanwhile developed into the standard coating for all valves in the area of untreated water, drinking water and wastewater. In addition to the use of high quality epoxy lacquers, for valves the environmentally friendly, solventfree **epoxy powder coating**, also called (EP) coating has become particularly popular.

As an outstanding and durable corrosion protection, **enamel** has been established in the area of water supply for many years. In the meantime, enamel is also used as an exterior coating to ensure an integral, continuous coating. For several years now, a closed coating system "**complete enamel**" has been available for materials, production and testing technology, which has now found its way into practical applications in the area of transporting of raw water, drinking water and waste water.

Pillar hydrants

Pillar hydrants used in the public water supply system must meet the requirements and other national regulations where applicable. Pillar hydrants project above ground level. They consist of two parts: the **bottom section of the hydrant** which contains the main valve and is installed underground plus the **top part of the hydrant** which is generally flanged onto the bottom part at ground level. Pillar hydrants are equipped with a predetermined breaking point which is normally located in the connection flange between the top and bottom parts of the hydrant.

The majority of pillar hydrants are in nominal sizes DN 80 and DN 100, designed for an allowable component operating pressure of 16 bar. They have a vertical or horizontal inlet with a flanged, push-in or spigot end joint. The pipe covering usually varies between 1.25 m and 1.5 m. This ensures that, even with a minimum volume of residual water, the main valve cannot freeze up. The bottom part of hydrants is normally designed for a fixed depth of pipe cover. **Pillar hydrants** are used in different piping and pipe joint systems.



The upper part of a pillar hydrant without drop jacket with B outlets which can be shut off

Underground hydrants

Of course **underground hydrants** used in public water supply systems must meet the requirements and other national regulations. They will also be used in nominal sizes DN 80 and DN 100. They are usually housed in surface boxes in the road and can be operated from there. A **standpipe** is always required in order to take off water and this is connected to the locking claw. The main shut-off device is actuated by applying a hydrant key.

Underground hydrants consist of a one or two-part shell, also referred to as a jacket pipe or **standpipe**, the lower part of which houses the shut-off device. **Underground hydrants** can have single or double shut-off devices. The double shut-off version is usually a ball or cone design. The double shut-off version has the advantage that the shut-off device including its drive elements can be replaced in the surface box with the pipeline under full pressure. As underground hydrants are usually located in surface boxes there is the risk that, with insufficient maintenance and in unfavourable locations (road subsidence) road grit, stones or other small objects may get into the shell and damage the shut-off device. In order to minimise this risk, sealing flap and cover are used in the area of the locking claw. **Underground hydrants** are used in different piping and pipe joint systems.



DN 80 underground hydrant: double shut-off, opening against the direction of flow – fully enamelled

Possible fields of application for hydrants

- taking off extinguishing water
- ventilating pipelines
- flushing piping networks, particularly in end sections for reasons of hygiene
- producing temporary network connections
- emergency water take-off
- short-term water supply, e.g. for construction purposes, funfairs, etc.
- bridging for emergency supplies
- drainage of pipelines
- leak detection

Author: Dr. Jürgen Rammelsberg

The article was slightly shortened by the editors. You can find the complete article with various illustrations as a PDF in the [download area](#) under Downloads Annual Issues EADIPS FGR.

Modernisation of drinking water treatment plants with ductile cast iron valves

Even before this project, **Stadtwerke Sindelfingen GmbH** already had good experiences with the **ductile cast iron valves** of ERHARD GmbH & Co. KG as regards service, reliability, maintenance and, not least, cost. According to its company philosophy “think global – act local”, ecological considerations are an essential part of the strategy concept of the Sindelfingen municipal utilities. One of these ecological considerations concerns the **Sindelfingen waterworks**: since its construction in 1977 it had started to age, three different items of **drinking water treatment equipment** were renovated and/or optimised. For example, air admission and release valves, butterfly valves, dismantling joints as well as soft-seated gate valves had to be replaced in a wide variety of processing units. So it was obvious to fall back on **ductile cast iron valves** during the modernisation of the **water treatment**.



PAS10 dismantling joints, ERHARD ROCO wave butterfly valves with integral electric drive

ERHARD TWIN-AIR admission and release valves for pipe networks

So now, for example, filtration no longer happens in multi-layer filters but in single-layer filters. The corrosion protection of the vessels was renewed and the new valves installed: On the modern single-layer filters, which are stocked with quartz sand and with activated carbon, ERHARD TWIN-AIR air admission and release valves are now operating, for example to discharge just about 100 m³/h of air safely and securely during air purging. The compact and space-saving TWIN-AIR air admission and release valve is perfectly suited for use in larger **pipe networks** and at all times guarantees safe and automatic air admission and release for the pipeline during filling, during operational air release and during the drainage process.

Double-eccentric butterfly valves, dismantling joints made of ductile cast iron

A large number of ERHARD ROCO wave double-eccentric valves of nominal sizes DN 100 to DN 300, pressure stage PN 16, with slider crank mechanism and with integral electric drive and/or with handwheel, for the most part with corresponding dismantling joints (ERHARD PAS10), have also been installed. The **ductile cast iron butterfly valves** with the patented wave design offer optimum energy efficiency and hence significant energy savings. High-quality EKB epoxy and enamel coatings plus a broad range of special coatings ensure lasting protection. The ERHARD PAS10 is equipped with two flanges and one pressure ring. This construction makes it possible to reduce the number of threaded rods as these only have a bracing function. The ERHARD PAS10 is equipped with 25 % threaded rods for pressure stages PN 10 and PN 16 and with 50 % threaded rods for pressure stages PN 25 and PN 40.

Soft seated Multamed gate valve

In the widest variety of inlet and outlet pipelines, new soft seated ERHARD Multamed **ductile cast iron** gate valves have been. The construction of this generation currently offers many advantages over the previous ones, one of which is decisive: after it opens, the wedge is entirely outside the passage, meaning that medium flow is not constricted.

Authors: Matthias Müller and Boris Vaihinger, ERHARD GmbH & Co. KG

The article was slightly shortened by the editors. You can find the complete article with various illustrations as a PDF in the [download area](#) under Downloads Annual Issues EADIPS FGR.

Extinguishing water pipeline of ductile cast iron in the new Swiss Galgenbuck tunnel

Ductile iron pipe systems have proved their worth for extinguishing water pipelines in road tunnels for decades now and in case of fire events they are extremely reliable for delivering firefighting water. After the opening of the A4 bypass in August 1996 there was a steady and enormous change in the traffic flow in the **Schaffhausen** and Neuhausen am Rheinfall region, resulting in an enormous increase in the traffic load on the feeder routes. In 2007, the Council of the Canton of Schaffhausen presented the implementation project for the new two-lane Galgenbuck tunnel which, as a bypass route, should almost halve the traffic load in the district of Neuhausen am Rheinfall and make the Schaffhausen South junction viable in the long term.



The route of the tunnel – Source: Bundesamt für Straßen (ASTRA), Switzerland

New construction project for traffic relief

Meanwhile the new Galgenbuck tunnel passes under the municipality of **Neuhausen am Rheinfall** in a wide arc, the two-lane road in the tunnel runs for a total length of 1,138 m with a maximum gradient of 4.5 % from the “Engi” portal in the West to the “Bahntal” portal in the East close to the Schaffhausen South motorway junction. The completion of all work and its commissioning is scheduled for the end of 2019.

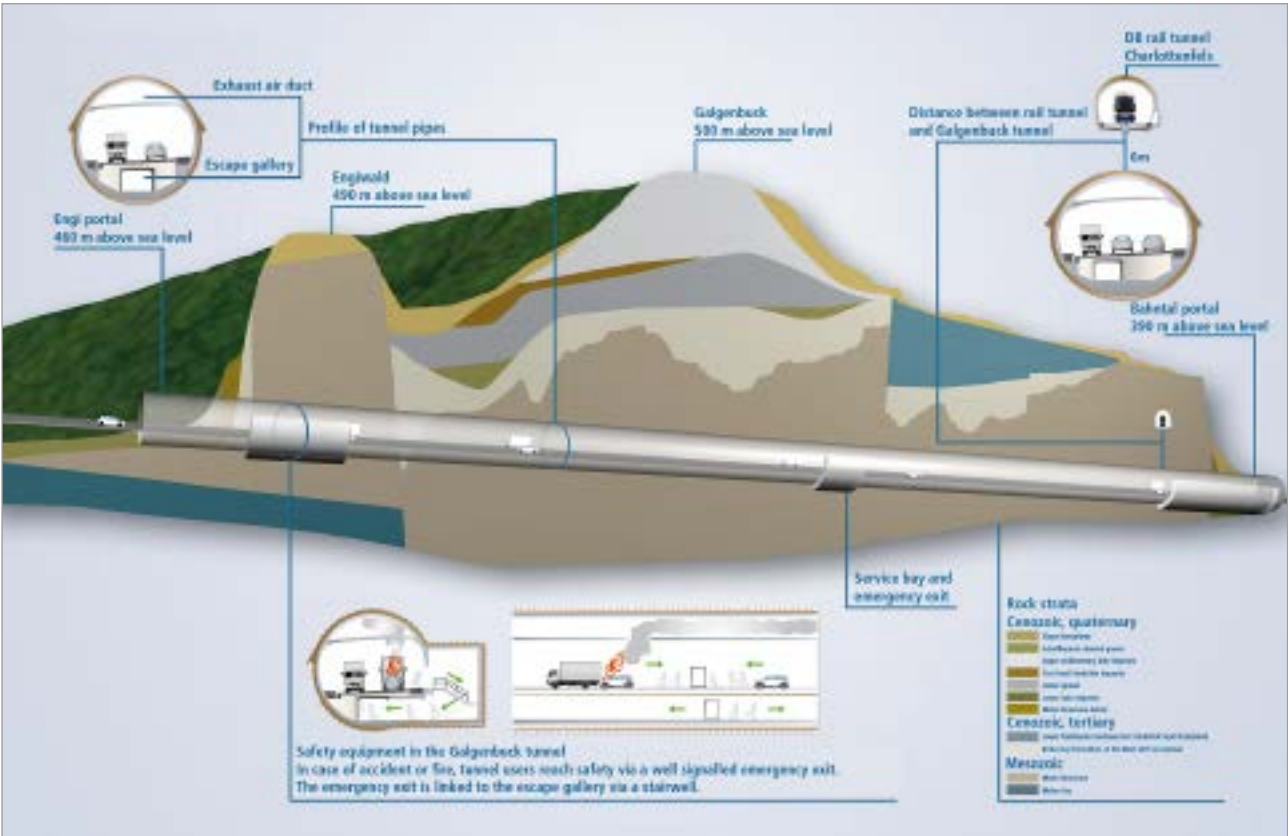
An extinguishing ductile cast iron water pipeline in the service duct

With the ongoing installation of the operating and safety equipment, the **extinguishing water pipeline** with its lateral outlets to the hydrant recesses at road level is the first thing to be installed in the service duct (WELK) located beneath the carriageway. Following that will be the installations for monitoring and controlling the tunnel.

The **pressurised water pipeline** in the service duct consists of **ductile iron pipes** of the vonRoll ECOPUR type in nominal size DN 250. It runs for a total length of 1,060 m in alignment with the tunnel with a minimum curve radius of 500 m and is fixed to the concrete back wall and the floor of the service duct by pipe clamps. The changes of direction in the curve are accommodated by the deflectability of the **push-in joints**.

From the main pipeline in the service duct, lateral branch pipelines spaced a maximum distance of 150 m apart supply the seven hydrants in the road space with extinguishing water. The branch pipelines are also constructed of ECOPUR full-protection DN 125 pipes in **ductile cast iron** and they run through a casing pipe above a chamber lying approximately 3 m below the hard shoulder to the hydrant connections. For the installation, overhaul and maintenance of the fire hydrants, the hydrant chamber is accessible at any time via an 80 x 80 cm large entrance from the road space.

The full-protection vonRoll ECOPUR pipes are integrally coated with polyurethane (PUR) and are classified in accordance with standard EN 545 as **cast iron pipes** with reinforced coating for use in all ambient conditions. Because of their highly resistant, pore-free PUR coating to EN 15189 they can be used in all types of soils and therefore have the best protection against corrosion even in the aggressive climate of the tunnel. ECOPUR pipes have a polyurethane (PUR) lining in accordance with EN 15655, that minimises deposits and, because of extremely low friction losses, promotes the hydraulic performance of the **extinguishing water pipeline** in case of fire. The entire **pressurised water pipeline** including the hydrant branch pipelines is secured against longitudinal forces by the assembly-friendly vonRoll HYDROTIGHT **thrust protection system**. The flexible **cast iron pipe system** is completed by vonRoll ECOFIT full-protection fittings with push-in and flanged joints which are also integrally protected with a thick epoxy coating to EN 14901 and the enhanced requirements according to RAL-GZ 662.



Schematic cross-section of the Galgenbuck tunnel – Source: Bundesamt für Straßen (ASTRA), Switzerland

High-performance hydrants for extinguishing water supply

The hydrant recesses are equipped with the high-performance double-armed vonRoll HYPLUS type hydrants which can deliver a maximum output of 4,000 l per minute (at a differential pressure of 1 bar). The patented joints between the top and bottom parts of the hydrants allow stepless 360° directing of the hydrants in the narrow installation recesses. The flexible VARIO 2.0 type H2L hydrant bottom with a maximum adjustment range of 70 cm (in 5 cm increments) offers optimal flexibility in the hydrant chambers when bridging over the existing level differences. The DUO maintenance shut-off installed as standard allows later overhaul work on the hydrant under full system pressure without decommissioning the extinguishing water supply.

Full-protection valves for secure operation and simple maintenance

At the high point of the tunnel vonRoll VS 5000 type shut-off valves are used as pipeline valves and for cleaning purposes. At the same time a vonRoll vent valve is arranged at this point to extract air from the **extinguishing water pipeline**. The extinguishing water pipeline in the service duct is equipped with a VS 5000 pipeline valve at each hydrant branch pipeline for uncomplicated inspection.

Author: Roger Saner

The article was slightly shortened by the editors. You can find the complete article with various illustrations as a PDF in the [download area](#) under Downloads Annual Issues EADIPS FGR.