

A microscopic view of numerous rod-shaped bacteria, likely E. coli, against a blue background. The bacteria are shown in various orientations and depths, creating a sense of a dense population.

# Uponor

## A leading expert confirms hygiene & efficiency of Uponor drinking water system installation

White paper and cost analysis

*“From a hygienic and technical point of view, the Uponor decentralised drinking water distribution system, in combination with a loop installation and flushing unit, demonstrated clear advantages when compared to a traditional drinking water system”.*

*Arnd Bürschgens, Drinking Water Hygiene Expert*

# Synopsis of white paper findings

Analysis by an independent water hygiene specialist has shown that Uponor Hygiene Logic delivers a significant improvement in drinking water hygiene when compared to a conventional drinking water system. The risk of water contamination (e.g. via legionella) and calcification is extremely low with the Uponor solution due to:

- No hot water storage and on-demand hot water generation,
- Frequent water exchange,
- Automatic system flushing when water is not used for longer periods, and
- Prevention of unexpected costs for legionella treatment.

Furthermore, the system is easier and quicker to install and requires less space for installation. When in use, the solution offers significant energy savings.

### Description of the location:

Both drinking water system designs were submitted as proposals for a 4-floor building with 7 apartments in Berlin. The drinking water systems were designed for all 4 floors in accordance with the German Drinking Water Ordinance (TrinkwV). According to the plans, all residential units would be equipped with meters to monitor individual consumption.

### Object details:

Location:	Berlin, Germany
Building type:	Residential apartment building
Total floor space:	59,9 -113,3 m <sup>2</sup>
Floors:	4 floors, 7 apartments
Project year:	2019/2020

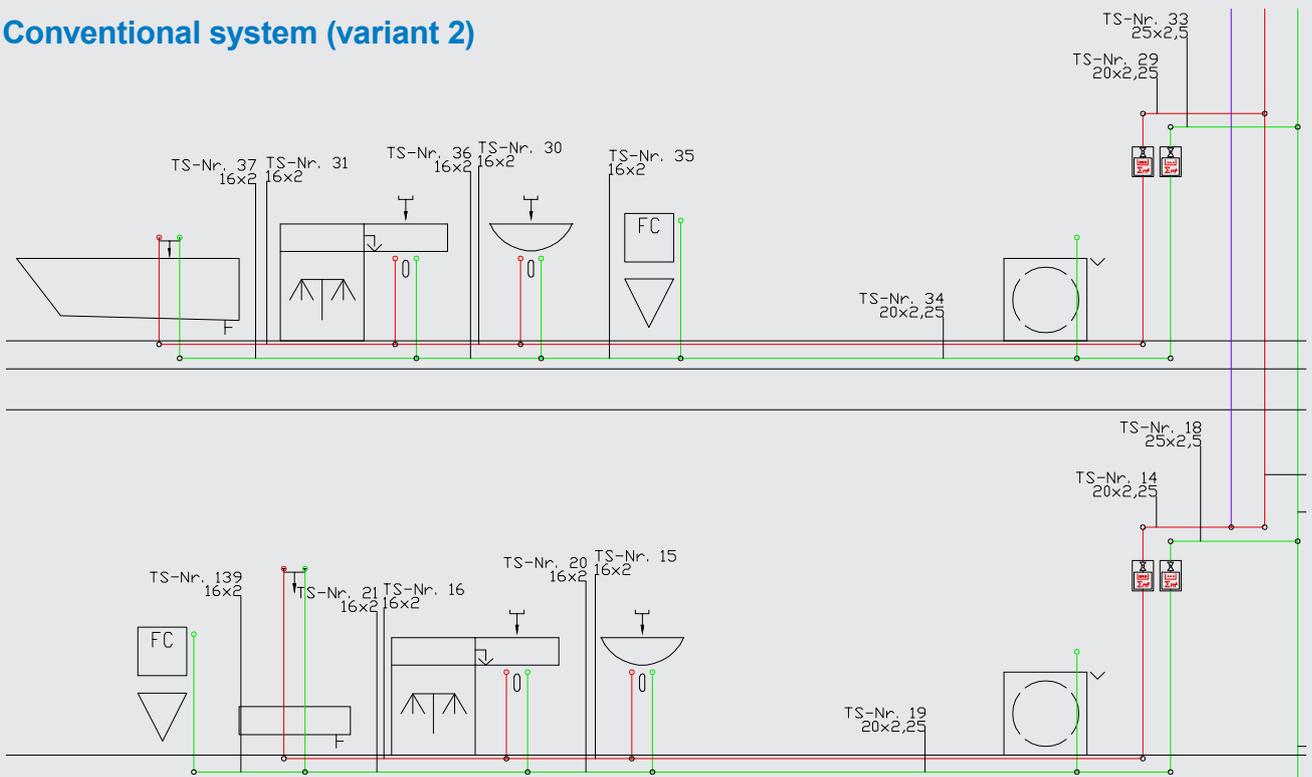


## White paper goals:

Arnd Bürschgens – a certified, third-party expert in drinking water hygiene – evaluated two different drinking water system designs (a conventional “T-joint” installation and the Uponor Hygiene Logic) for a multi-family residential building. He compared both system designs from a technical and a hygienic point of view.

The conventional drinking water system called for the centralised distribution of water and the T-joint floor installation method. Uponor Hygiene Logic was considered as a modern design alternative with a decentralised heat interface unit, riser systems, loop installation, and an automatic flushing station.

### Conventional system (variant 2)



# Cost-effectiveness: Conventional vs. Uponor Hygiene Logic

Residential building with 7 apartments	Conventional installation	Uponor Hygiene Logic
<b>1 Investment costs</b>	<b>€ 48,150.00</b>	<b>€ 63,300.00</b>
1.1 Material costs (pipes, insulation, fittings, heating systems, valves, underfloor heating)	€ 42,100.00	€ 58,100.00
1.2 Labour costs	€ 6,050.00	€ 5,200.00
<b>2. Operating costs calculated for 6 years of operation</b>	<b>€ 26,450.00</b>	<b>€ 5.800.00</b>
2.1 Legionella inspection (every 3 years)	€ 3,000.00	€ 0.00*
2.2 Laboratory costs (every 3 years)	€ 2,400.00	€ 0.00*
2.3 Water meter reading / warm (every year)	€ 1,200.00	€ 0.00
2.4 Water meter reading / cold (every year)	€ 1,200.00	€ 1,200.00
2.5 Warm water meter exchange (every 5 years)	€ 1,900.00	€ 0.00
2.6 Inspection costs of HIU and flushing station (every year)	€ 0.00	€ 3,850.00
2.7 Inspection of boiling room (every year)	€ 750.00	€ 750.00
2.8 Risk analysis	€ 4,000.00	€ 0.00
2.9 Legionella elimination (thermal / chemical disinfection)	€ 12,000.00	€ 0.00
<b>3. Energy costs calculated for 6 years of operation</b>	<b>€ 32,990.00</b>	<b>€ 30,717.00</b>
<b>Cost comparison to traditional drinking water system</b>	<b>€ 107,590.00</b>	<b>€ 99,817.00</b>

**7,2%**  
savings

\* The costs are eliminated only if all rules of drinking water distribution (e.g. installation, maintenance and others) were applied in full extent.

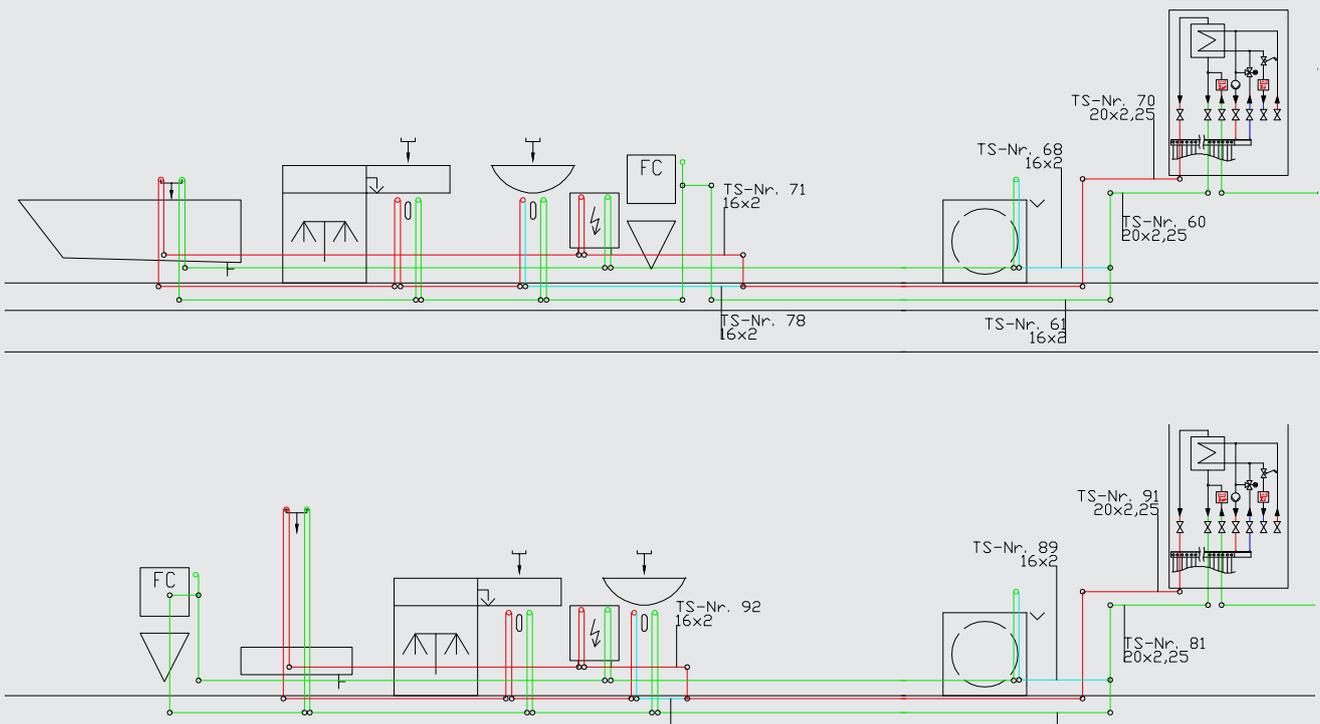
## Cost analysis methodology:

The comparison of total costs (see chart above) for a traditional way of installation (without T-joint) and Uponor Hygiene Logic solution was provided by an Uponor project team and is not part of the expert's evaluation. The cost-efficiency analyses took account of building materials and labour costs, as well as hypothetical operational costs with legionella contamination.

## Conclusion based on costs and white paper findings

In conclusion, the building owner can achieve **more than 7% saving with the Uponor Hygiene Logic** already after first 6 years of operation. In addition, the higher hygienic standards of Uponor Hygiene Logic provide the benefit of preventing legionella contamination in the long-term perspective.

## Uponor Hygiene Logic (variant 1)



# Key products of Uponor Hygiene Logic



## Uponor Uni Pipe PLUS

Unique worldwide, the multilayer composite-pipe system from Uponor is ideal for drinking water systems. The pipe is produced under the strictest hygienic conditions and is hygienically sealed. Thanks to its flexibility and stability, Uni Pipe PLUS is the perfect fit for loop installations.

## Uponor Smatrix Aqua PLUS

Uponor Smatrix Aqua PLUS is an automatic hygienic flushing system that assured compliance with hygiene regulations and legal standards. It can even be retrofitted into older buildings.



### Uponor Aqua Port & Combi Port

Fully customised heat interface units from Uponor allow you to heat up your drinking water efficiently using your central heating system. A drinking water storage tank and domestic hot water distribution network is not required. The heat exchanger installed in the unit rapidly heats up the cold drinking water at the precise moment you open the tap.

### Uponor S-Press PLUS

The new generation of press fitting system for composite pipes. S-Press PLUS is the perfect solution for ensuring permanently tight pipe connections. S-Press PLUS is resistant to any kind of drinking water with best-in-class Zeta value (decreased pressure loss by up to 60%). Uponor S-Press PLUS fittings passed dezincification resistance test with highly aggressive drinking water - tested by independent Hygiene-Institut des Ruhrgebiets in Gelsenkirchen, Germany.

### Uponor riser installation

To keep the cold water temperature below 25 °C at all times, Uponor riser installations ensure that the heating riser won't warm up the cold domestic water riser, thus avoiding Legionella growth and resulting health issues. We recommend a mineral wool heat barrier between the cold and hot water risers for a professional installation.

#### The white paper was created with support of:

- Engineering office for building services "IB - Ramezani"
- Installation company for HVAC Orthen GmbH
- Independent hygiene expert Arnd Bürschgens

# Significant benefits with Uponor Hygiene Logic

## Hygiene:

- Loop installation and automatic flushing ensures water does not stagnate
- Significant reduction in the volume of water within pipes
- No unpermitted heating of the cold drinking water inside the shaft
- As there is no hot water tank, a critical point for bacterial growth is eliminated



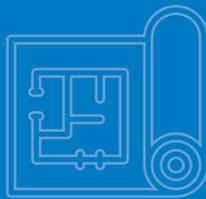
## Energy-efficiency and environmental sustainability:

- No heat loss within the PWH and PWH-C
- Reduced energy consumption due to eliminating of the circulation pump
- No energy storage inside of the tap water distribution as the domestic hot water is generated only on demand.
- Significantly improved carbon footprint and future-oriented system due to lower operation temperature



## Space usage and installation:

- Uponor Hygiene Logic needs less space than gas boiler systems
- No installation of 2 DHW and DHW-C including pipes, insulation and fittings
- No space requirement and expenditure within the building for shafts, break-throughs, fire protection measures for wall ducts
- No hydraulic balancing



## Maintenance and service

- No hot water meter omits potential need for replacement and service
- No regular inspection of water quality
- Easier maintenance and allocation of costs, because issues generally affect one apartment



***“All measures, which a prudent and technically versed, cautious within reasonable limits and economically thinking planner, considers necessary and sufficient to protect others from harm, must therefore be included in the planning.”***

**Arnd Bürschgens, Hygiene Expert**



Apart from offering independent evaluations of drinking water systems, appointed water hygiene expert Arnd Bürschgens is a sought-after lecturer i.e. for VDI-certified water hygiene seminars, author of the first specialist book on “Legionella in drinking water installations” (Beuth publishers) and member of multiple standardization bodies, such as DVGW (German association of gas and water), the VDI (Association of German engineers) and DIN (German Institute for Standardization).