

Aquasim: major facility for research and innovation in sustainable water management

Testing the management of the water cycle under realistic and controlled conditions at the scale of the building and its plot of land using a multidisciplinary approach. This is what the CSTB offers to guide stakeholders in water management as they develop innovation approaches to improving the sanitary quality of water and reducing the environmental impact of buildings.

KEY FIGURES

- > 2300 m² building
- > 5000 m² area of plots of land
- > 7 km of piping systems
- > Storage basins from 50 to 200 m³
- > 20 tanks from 1 to 6 m³



Based at the CSTB in Nantes, the Aquasim test facility can generate and collect various types of water:

- Rainwater from roofs
- Gray water from showers and washing areas
- Storm water (runoff from roads)
- Domestic wastewater
- Drinking water
- Pool water
- Groundwater

The impacts of their use or discharge, as well as the drivers of their reuse, are studied using test equipment dedicated to each specialist area.

Unique in Europe, Aquasim brings together a large number of researchers and engineers to study sustainable water management.

Through collaborative research and assessment projects, the CSTB guides public authorities and municipal and construction stakeholders in improving the sanitary quality of water and reducing the environmental impact of buildings. It supports industrial companies in the development of various materials and facilities.

Aquasim has laboratories for characterizing water quality and materials:

- Physicochemical analyses of water
- Microbiological analyses of water and biofilm to study health hazards
- Materials analysis to study water/material interactions
- Sensory analysis and physiological measurements for objective assessment of the taste and smell of water

Full-scale test facilities for testing all types of water under real-life and controlled conditions:

- Drinking water treatment units: filtration, softener, UV, ozone generator, osmosis unit, ion exchanger, production of chlorine dioxide
- Climatic basin (96 m³ with controlled temperature and humidity)
- Plant bed (80 m²) and plant cover (80 m²)
- Plot of land with groundwater (38 m², 70 m³)
- Storm water and treated wastewater infiltration plots
- Plots of land for the installation of on-site sanitation systems
- Reference water basin (40 m³)

MANAGEMENT OF THE WATER CYCLE IN BUILDINGS

- Provide people with water
- Maintain the ecological balance
- Improve the sustainability of water systems and sanitary equipment
- Support innovation

The CSTB guides public authorities and industrial companies in managing these challenges on the scale of materials/components, buildings and neighborhoods.



5 800 m²
of unique test facilities
in Nantes and Marne-la-Vallée

100 expert

LCA building
Elodie software

01 Assistance with design, safeguarding and rehabilitation of water systems (piping systems, components): sizing and durability. Study of water/material interactions in systems: impacts on health, environment durability.

02 Analysis of facility performance: tapware, appliances, sanitary components, connected facilities (treatment, water use). Accessibility of sanitary appliances to the elderly.

03 Sensory and organoleptic quality of drinking water.

04 Wastewater treatment. Discharge back to the environment.

05 Impact of infiltration of storm water in the underground environment.

06 Rainwater collection and storage.

07 Rainwater harvesting for toilet flushing.

08 Impact of plant cover on rainwater management before discharge into the rainwater drainage system.

09 Sizing, rehabilitation and durability of drainage systems (piping systems, components).

10 Wastewater treatment. Discharge back to the environment (water environment).

11 Collective wastewater treatment. Discharge back to the environment.

12 Reuse of wastewater and waste by anaerobic digestion.

13 Study of the quality of recreational water and its impact on building structures and health.

🔥 Recovery of heat from gray water (indoor piping) and wastewater (drainage systems).

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