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A world first: SADE and CEA-List develop a robot for rehabilitating water supply networks

At the Pollutec trade show in Lyon from 7 to 10 October 2025, SADE – the NGE Group's specialised water cycle subsidiary – and List, an institute of the French Atomic Energy and Alternative Energies Commission (CEA) specialising in intelligent digital systems, have announced the launch of the TUBOCONTACT SD (Tubocontact small diameters) solution. This major technological breakthrough offers a high-performance solution for rehabilitating small-diameter, cast-iron water distribution pipes. This environmentally responsible innovation requiring no trench excavation – an economically attractive solution for contracting authorities – is the fruit of four years of collaboration between SADE Engineering and CEA-List.

A key solution for managing network assets

In France, almost a billion cubic metres of drinking water are lost every year through leaky water supply systems, and the annual renewal rate of 0.66%[1] means that this situation is set to last. The obstacles are known to include the duration and cost of renewal projects, particularly for distribution pipes, which account for the majority of pipelines.

Renovation rather than replacement is the goal of TUBOCONTACT SD. This process was devised, designed and developed by SADE and CEA-List to meet the needs of contracting authorities wishing to improve the efficiency of their systems. It enables the rehabilitation of distribution pipes – from 100 mm in diameter and upwards – via short, minimally invasive, trenchless worksites at controlled cost, and above all with little impact in terms of disruption.

An abundance of innovations in an autonomous robot

Incorporating a number of state-of-the-art innovations, TUBOCONTACT SD is an autonomous robotic solution for rehabilitating cast-iron pipes in diameters of 100 to 150 mm, with minimal excavation works and the refurbishment of service pipe connections from the inside. Drawing on SADE's professional expertise, it combines a number of digital innovations from the CEA:

- Mecatronic miniaturisation: integration of much smaller drilling, reboring and laying tools;
- Advanced sensors: stereoscopic vision, laser and eddy currents to locate pitting behind the sheath;
- Comprehensive process chain: inspection, re-drilling, cleaning and sealing.

An innovative process with a significantly reduced environmental impact

The two partners have jointly developed an innovative rehabilitation process, tested on SADE's test platform in Melun and based on four stages:

1. Location and preparation of sites of existing pitting corrosion
2. Retubing with a new high-density polyethylene (HDPE) pipe
3. Robotic reopening of the sheath in line with the connections

[1] Source: SISPEA, 2024 (year 2022)

4. Fitting of waterproofing patches (SADE patent)

The trials were highly conclusive, showing major benefits: the process reduces the surface area of worksites by 70%, their duration by 40% and their greenhouse gas emissions by 70%.

These excellent operational and environmental results demonstrate that TUBOCONTACT SD is a disruptive and innovative high-performance solution, capable not only of meeting the current challenges of renewing water distribution systems, but also of providing a sustainable and socially acceptable alternative to the traditional methods that still predominate today.

In addition to its immediate benefits for local authorities and users, TUBOCONTACT SD helps to provide effective and sustainable solutions for rehabilitating water supply systems that fully meet all the requirements of health standards.

Demonstrations of TUBOCONTACT SD will be held on the **NGE stand (Stand 86 Hall 4)** at the Pollutec trade show, at Lyon Eurexpo, from 7 to 10 October 2025.

About SADE www.sade-cgth.fr

With over 100 years of experience, SADE – an NGE Group subsidiary – specialises in the design, construction, rehabilitation and maintenance of networks (water and energy) and infrastructures (civil engineering and underground works) for all public and private-sector clients in France and internationally. As a driver of ecological transformation, it promotes innovative, energy-efficient technical solutions for more environmentally friendly networks and low-carbon infrastructures.

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About CEA-List

CEA-List, based at CEA-Paris-Saclay and CEA-Grenoble, is CEA's technological research institute dedicated to intelligent digital systems. Its R&D programmes, focusing on the industry of the future, artificial intelligence, digital trust and digital health, contribute to the industrial competitiveness of its partners through innovation and technology transfer. Our 1,000 research engineers and technicians use their expertise to address major socioeconomic challenges by offering people-centric, high-added-value technological innovations embodying the values of social and environmental responsibility. CEA-List is a member of the Carnot Institute network. For more information: https://list.cea.fr

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