Revamping a ZLD Waste Water Treatment Plant

Hydro Italia pursued the zero liquid-discharge objective by revamping Dana's pre-treatment water purification plant.

Hydro Italia recently built and tested the entire water treatment section of the pre-treatment line operating at the Rovereto plant of multinational company Dana, which specialises in the manufacture of axles and transmission shafts and mechatronics for commercial and non-commercial vehicles.

Already a long-standing partner of Dana, in the past Hydro Italia had successfully installed a Hydrofloty 24M sludge separation system for treating the water flowing from the factory's two coating booths and a 6 m³/day vacuum evaporator for purifying and recirculating the cleaning water and the phospho-degreasing baths' liquid collected from the paint pre-treatment tunnel, thus creating a zero liquid-discharge water cycle. In addition, a 500 l/h reverse osmosis system had been installed for refilling low-salinity water (conductivity < 10 µS/cm) into the pre-treatment line. As the pre-treatment section had to be adapted to an increase in production of more than 30%, a revamping project of the existing water treatment system was also developed.

The aim was to integrate plant improvements and new solutions, always continuing to pursue the goal of zero liquid-discharge – a philosophy that over the years has always distinguished Hydro Italia in the field of water treatments for the coating sector.

The Hydrofloty 24M sludge separation system.

The new oil separator.

Specifically, Hydro Italia installed a new ion exchange resin-based demineralisation plant with a nominal capacity of 5,000 l/h for the last cleaning stage of the pre-treatment tunnel. In order to ensure 24/7 continuity, the system has a duplex configuration. Also with a view to the ZLD goal, a new vacuum evaporator was added to treat the waste water generated by the demineraliser's resin regeneration process, as well as bath concentrates that are not treated by the main evaporator. The revamping project was completed with the installation of a new oil separator to replace an old machine that was undersized compared to current needs. Indeed, keeping the phospho-degreasing tanks free of oil residues results in better efficiency in the subsequent stages. The new oil separator automatically works alternately on the two tanks by means of two floating suction units located inside the phospho-degreasing tanks themselves.

The installation of the new equipment was completed in November 2022 and the testing and start-up phase was conducted at the beginning of January 2023, in conjunction with the restart of the coating line. The preliminary and preparatory work for the construction site has been carried out in the summer, including, for example, moving the existing treatment plants (the evaporator and the osmosis system) to the new area devoted to water treatment.