

Solutions for Process Automation

Maintaining the world's largest ground-based telescope

Customer reference: Fagerström
Industrikonsult AB, Sweden

Mirror elements of the ELT in Chile will be washed and stripped using a complete Process Automation solution by GF Piping Systems.

Automating continuous surface treatment of 798 mirror elements



The ELT (Extremely Large Telescope) by ESO, currently under construction in Chile's Atacama Desert, is the world's largest telescope. At its heart is a 39-meter diameter primary mirror designed to collect tens of millions of times as much light as the human eye. In order to ensure maximum performance, Swedish company Fagerström Industri Konsult AB was commissioned to build a washing and stripping plant for the mirror segments. Solutions by GF Piping Systems were selected to handle the specialized chemicals and ultrapure water.

Project background

The ELT's primary mirror will consist of 798 hexagonal segments, with a diameter of approx. 1.5 meters each and made of a glass-ceramic material with very low thermal expansion. In order to achieve the highest possible sensitivity, the segments need to be recoated every 18 months. This means removing, recoating, and reinstalling two segments every day throughout the ELT's lifespan. Therefore, when Fagerström was awarded the contract to design a washing and stripping plant, the company required flow solutions that could ensure a precise and reliable operation while withstanding harsh environments.

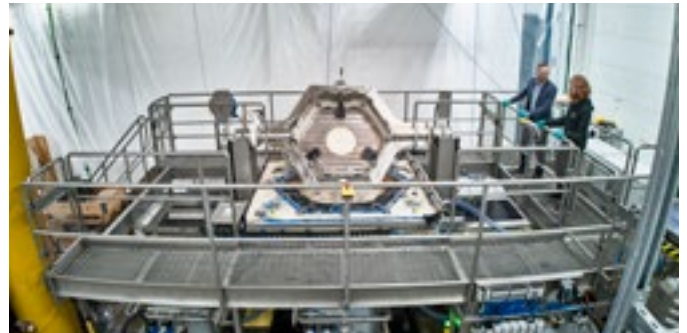
Selected technical solution

The plant uses sulfuric acid and cerium sulfate to dissolve the reflective layer of the segments, which is primarily made of silver. The segments are washed with ultrapure water. Then, the surface is stripped and dried using an air knife before being recoated. After extensive material testing, GF Piping Systems supplied a complete solution consisting of manual and automated valves from the PROGEF product family as well as accessories such as LED position feedback sensors and spring return units. In addition, the company provided critical measurement sensors for parameters including level, pressure, and temperature.

Achieved improvement

PROGEF is a polypropylene welded piping system designed for durability and high chemical resistance, and therefore contributes to a long-lasting and reliable operation for Fagerström's washing and stripping plant. At the same time, GF Piping Systems' measurement sensors optimize compatibility while providing the operators with precise data for this essential process. When the ELT becomes operational at the end of the decade, the plant will play a key role in advancing astrophysical knowledge, enabling a deeper exploration of the Universe and providing sharper images of cosmic objects than ever before.

Cover image: Artist impression of ESO's ELT, Credit: ESO



The plant uses Process Automation by GF Piping Systems to clean the ELT's 798 mirror segments.



The valves and sensors work together seamlessly to meet the high demands of the cleaning and stripping process.

Customer benefits

- **Durability:** With a wide selection of materials, GF Piping Systems offers long-lasting and reliable Process Automation solutions for harsh environments.
- **Precision:** Thanks to seamless integration and full compatibility, measurement and control sensors provide critical and dependable data.
- **Customization:** GF Piping Systems can provide tailor-made solutions for the most challenging applications.

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