Sagem delivers first prototype primary mirror segments for the European Extremely Large Telescope

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Sagem (Safran group) has delivered to ESO (European Southern Observatory) the first five prototype segments for the primary mirror on the European Extremely Large Telescope (E-ELT), a major step forward in proving the feasibility of this exciting new instrument.

The E-ELT is a huge telescope with a primary mirror measuring some 40 meters in diameter (130 ft), designed to significantly improve our understanding of the Universe. It comprises nearly 1,000 mirror segments, whose shape and position are continuously adjusted using miniature electromechanical actuators. While improving the overall image quality, this giant mirror also provides a 15-fold increase in the surface area that gathers in light from the stars, outpacing all telescopes built to date. The European Extremely Large Telescope will drive considerable progress in astronomy, especially through its ability to directly acquire images of exoplanets (outside the Solar System). It will start operation early in the next decade pending a final go-ahead for E-ELT construction from the ESO Council.

The prototype mirrors for the E-ELT are produced by Reosc, a Sagem entity in Saint-Pierre-du-Perray, near Paris. This facility is unrivaled in Europe, with its ability to polish large mirrors to a surface accuracy of several nanometers, especially the aspheric segments located off-axis on the mirror.

Sagem met several major technological and industrial challenges on the E-ELT program. For instance, the 1.4-meter aspheric, hexagonal-shaped segments were produced to unprecedented precision out to the edge of the mirror, using an advanced computer-aided polishing technique and ion beam machining. The large radius of the telescope mirror (84 meters/275 ft) made it very difficult to measure these segments, thus requiring the use of an "extra large" test bench.

Sagem develops and produces high-performance optics for satellites, large telescopes, high-energy lasers and the semiconductor industry. For example, the company made the single-piece 8-meter (26 ft) mirrors for Europe's Very Large Telescope (VLT), and the international Gemini telescope. It also made the 11-meter (36 ft) mirror for the Gran Telescopio de Canarias, the mirrors for the Nirspec instrument on the James Webb Space Telescope and the Gaia astronomy satellites, as well as optics for Meteosat, Spot and Helios satellites.

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Sagem, a high-tech company in the Safran group, holds world or European leadership positions in optronics, avionics, electronics and safety-critical software for both civil and military markets. Sagem is the No. 1 company in Europe and No. 3 worldwide for inertial navigation systems (INS) used in air, land and naval
applications. It is also the world leader in helicopter flight controls and the
European leader in optronics and tactical UAV systems. Operating across the
globe through the Safran group, Sagem and its subsidiaries employ 7,000 people
in Europe, Southeast Asia and North America. Sagem is the commercial name of
the company Sagem Défense Sécurité.
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