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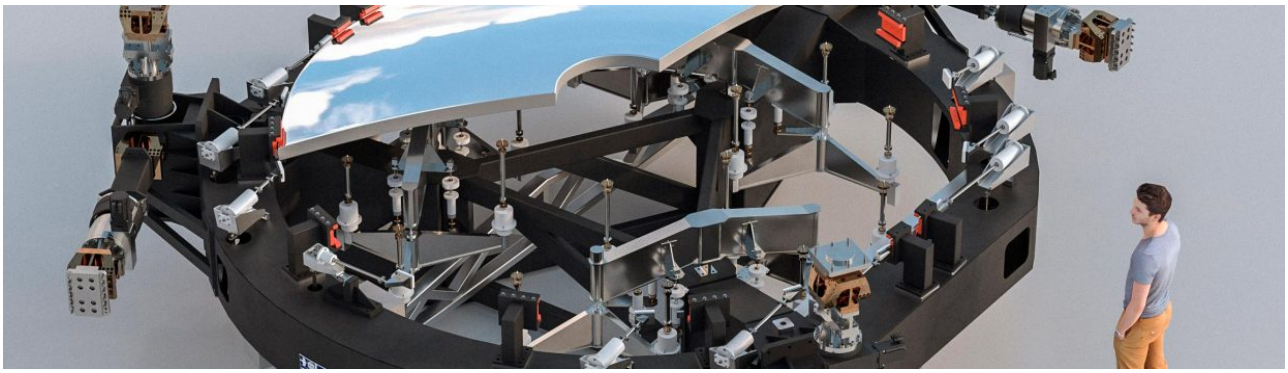
Secondary and Tertiary Mirrors Cells for the Extremely Large Telescope



SENER AEROSPACE & DEFENSE / ASTRONOMY AND SCIENCE / TELESCOPE SYSTEMS / CHILE

SECONDARY AND TERTIARY MIRRORS CELLS FOR THE EXTREMELY LARGE TELESCOPE

Cliente: European Southern Obserbatory (ESO)

País: Chile

The Extremely Large Telescope (ELT) is a revolutionary new ground-based telescope concept that will have a 39-metre main mirror and will be the largest optical/near-infrared telescope in the world. The ELT concept started in 2005, the programme was approved in 2012 and green light for construction was given at the end of 2014. First light is targeted for 2024.

Sener Aeroespacial has been contracted by the European Southern Observatory (ESO) for the design, construction, validation and delivery of the ELT Secondary Mirror (M2) and Tertiary Mirror (M3) Cells.

The cells' mechanisms guarantee the alignment of the telescope during observation while correcting optics deformations. In this process, a high precision hexapod will be responsible for aligning and tracking the

mirrors and an active structure will be used to compensate errors in the mirrors' surface.

These are large-size critical elements of the telescope that require extremely high precision levels to give the telescope optimal image quality.

The main M2/M3 Cells performances are:

- Provide 5 degrees of freedom position capabilities to align the mirror within the telescope and mirror shape adjustment capabilities, to compensate both fixed errors and shaped errors introduced by gravitational effects.
- Each mirror has a size larger than 4m and 3.2 Tons and the complete Cell will have a size larger than 6.5 m and close to 12 Tons.
- Compensate the mirror surface error in tens of nanometers by means of an innovative solution using warping harnesses and lateral supports.
- Provides alignment and tracking capabilities with absolute accuracy of tens of microns.

The project is expected to be developed along 5 years and expected to be completed with the acceptance at factory and delivery of the equipment. The scope of work includes more than two years in preliminary and detailed design phases and the construction, integration and testing of the Cells using mirror dummies. Sener will also provide all the auxiliary equipment developed by our Sener team in Poland that includes integration tools, transport containers, mirror covers and testing equipment.