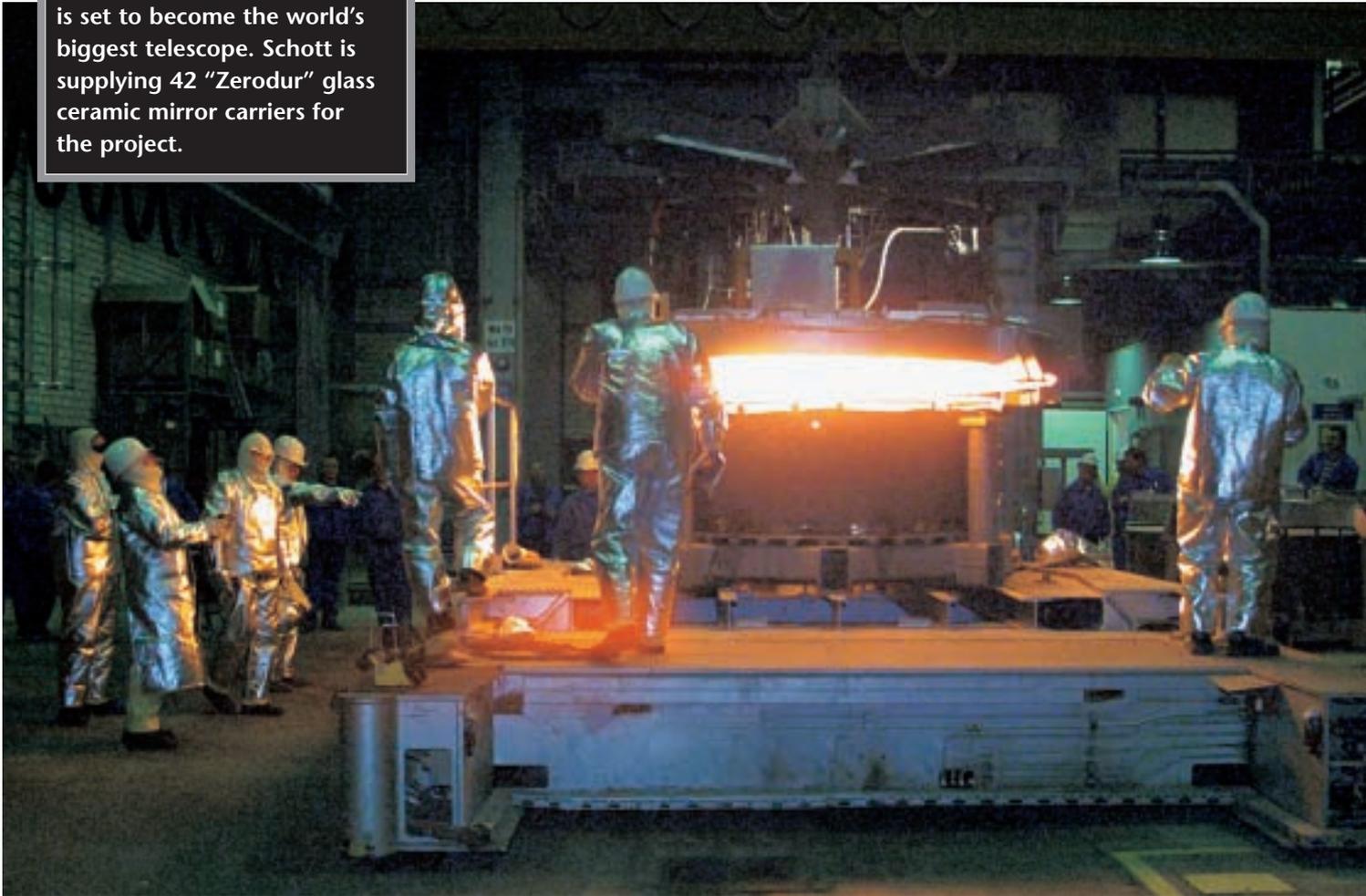


DISCOVERING

The Gran Telescopio Canarias is set to become the world's biggest telescope. Schott is supplying 42 "Zerodur" glass ceramic mirror carriers for the project.



A "hot" spectacle: In mid-February 2000, Schott began with the casting of the first blank for the Grantecan Project.

Tourists love the Canaries because of their unique landscape and pleasant climate. Astronomers are drawn to it because of the clear nights there. For the island group in the Atlantic is regarded as one of the world's ideal locations for observing the universe. The research facilities there and the scientists who work in them are among the most renowned in their field. The archipelago's large international observatories are located on Tenerife and La Palma. The first ones were opened in 1985. Since then 20 telescopes have been installed there.

New eye on the sky

It is more than eight years since planning first began for arguably the most ambitious and most prestigious project to date by the Canaries Astrophysical Institute (IAC). The location of the 75 million Euro project, the Gran Telescopio Canarias (Grantecan, GTC) is the Roque de los Muchachos on La Palma. The observatory is financed by the Spanish state and the regional government of the Canaries. In addition considerable resources have been made available from the European Structural Fund. Schott was awarded the contract for the primary mirror, the "heart" of the

telescope – in the face of competition from the USA and Russia – because of the superior quality of its "Zerodur" material.

High demands on material

The segmented primary mirror has a diameter of 10.4 meters (ca. 11.4 yards) and a surface area of 82 square meters (ca. 98 sq. yards). It comprises 36 hexagonal "Zerodur" glass ceramic segments. Each 1.9 meter (2 yards) diameter segment is 85 millimeters thick (3.4 inches) and weighs nearly

the Past

500 kilograms (1100 pounds). The high demands made on optical quality are just one of the features that make the primary mirror the most sophisticated part of the telescope. The support system for the individual segments and its electromechanical devices calls for the highest degree of precision. The “active optics” allow the most minor geometrical irregularities in the total system to be corrected, providing optimum alignment and superb image quality.

Comparable with top telescopes

The GTC – currently one of Spain’s largest science projects and the biggest European telescope in the Northern Hemisphere – will be comparable in performance with the Keck telescope on Hawaii (USA) and the European Southern Observatory’s (ESO) Very Large Telescope on the Cerro Paranal in Chile. The Spanish observatory not only increases the number of the world’s telescopes in the 8-to-10 meter class, but it will combine a large collector surface with an excellent image quality and will be suitable for an observation spectrum in the visible and infrared range. This will permit scientific work over a large bandwidth.

The Grantecan represents the best instrument to date for the exploration of the Northern Hemisphere sky. The construction of the GTC will increase observation capacity for the Northern Hemisphere in Europe, while strengthening the location on the Canary Islands, which is to be known as the European Northern Observatory (ENO).

The timetable

The first two mirror blanks were finished in January 2000 from stock material. In all, Schott will be supplying 42 mirror carrier segments, which includes six “spares”, by the end of 2001. Before delivery, demanding specifications have to be met – not only regarding material quality but also the geometrical precision after machining. This calls for the use of modern measurement technology such as a laser tracker.

From Mainz, the mirror carriers go to the French company REOSC near Paris where they are polished. The GTC is expected to carry out its first observations at the end of 2002 with a temporary primary mirror comprised of eight to ten segments. The remaining segments will be installed in the course of 2003 and the whole system will finally come into full service in 2004 ■

The mirror segments are made from “Zerodur” glass ceramics with a thermal expansion coefficient of practically zero.



The primary mirror is made up of 36 hexagonal segments: With a diameter of 10.4 meters and a maximum size of 11.3 meters, Grantecan is the world’s largest telescope.