(3)

Test certificate

Test at the completion of coating of the mirror

Primary mirror

Jena
12.05.1997

Scope

The scope of the test is to check the quality of the coating of the newly manufactured primary mirror for the Kottamia observatory of the National Research Institute of Astronomy and Geophysics (NRIAG).
The main task of the test is to verify, that the design specifications are met.

Applicable documents

- CALL OF AN INTERNATIONAL TENDER FOR THE SUPPLY OF THE BLANK OF THE PRIMARY MIRROR FOR ITS OPTICAL FIGURING AND COATING
  November 1993

- The Supply Of The Blank Of The Primary Mirror
  Its Optical Figuring, Polishing And Coating
  Technical proposal — Carl Zeiss Jena GmbH
  January 94

- The Supply Of The Blank Of The Primary Mirror
  Its Optical Figuring, Polishing And Coating
  Commercial and Administrative Section — Carl Zeiss Jena GmbH
  January 94

- Contract No. 7 Year 1994
  Supply and Installation of the Main mirror and Subsidiary mirror for the Kottamia Astronomical Observatory

- Test plan for the 74" optics Kottamia issue 02/ March 1997

Test definition

The test is the verification of the reflection of the mirror coating in different wavelengths.

Test procedure

The degree of reflection of the mirror surface was determined using test glasses, which are coated during the same coating process, appropriately distributed in the vacuum test chamber. The uniformity of the reflection coating is ensured by test glasses evenly distributed over the mirror area. One test plates was positioned on the outer edge of the mirror ,one test plate was positioned in the centre hole of the mirror.
The reflectance was measured at an angle of incidence of 0°.
A visual inspection of the mirror surface completed the test.

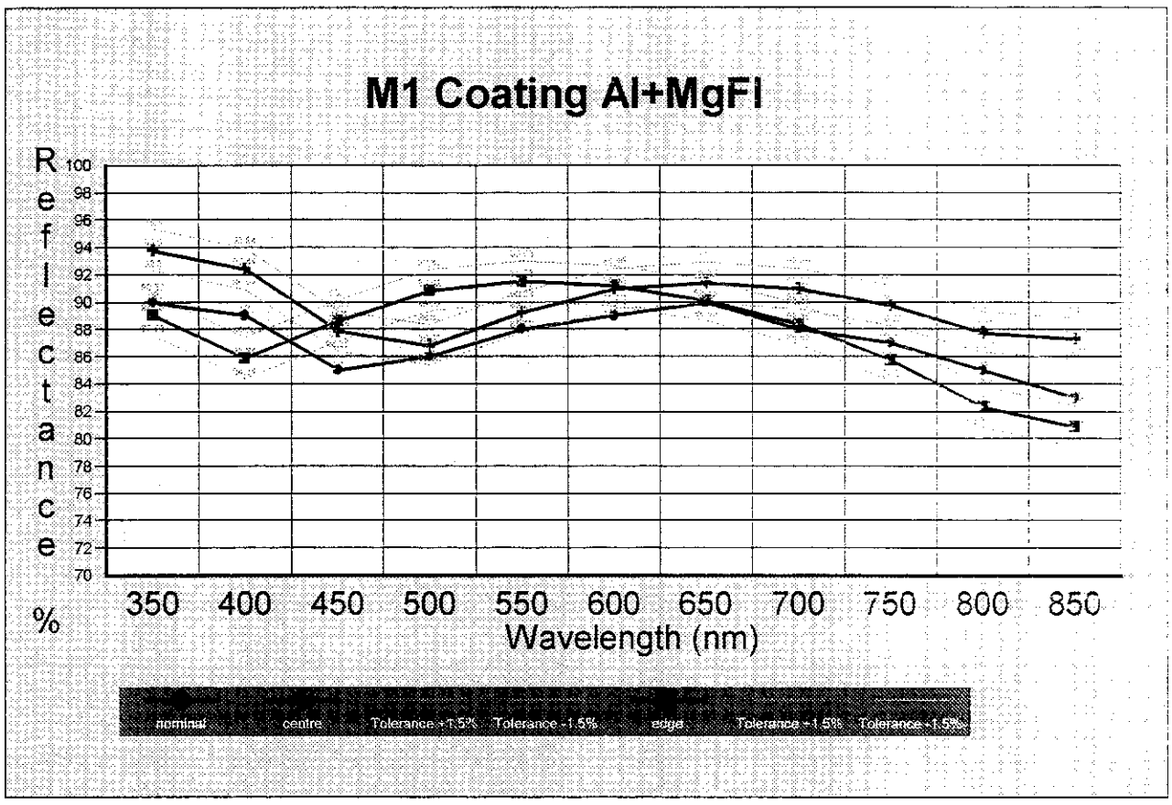
Test criteria

Coating: Aluminium with a protective coating of Magnesium fluoride

Reflectance:

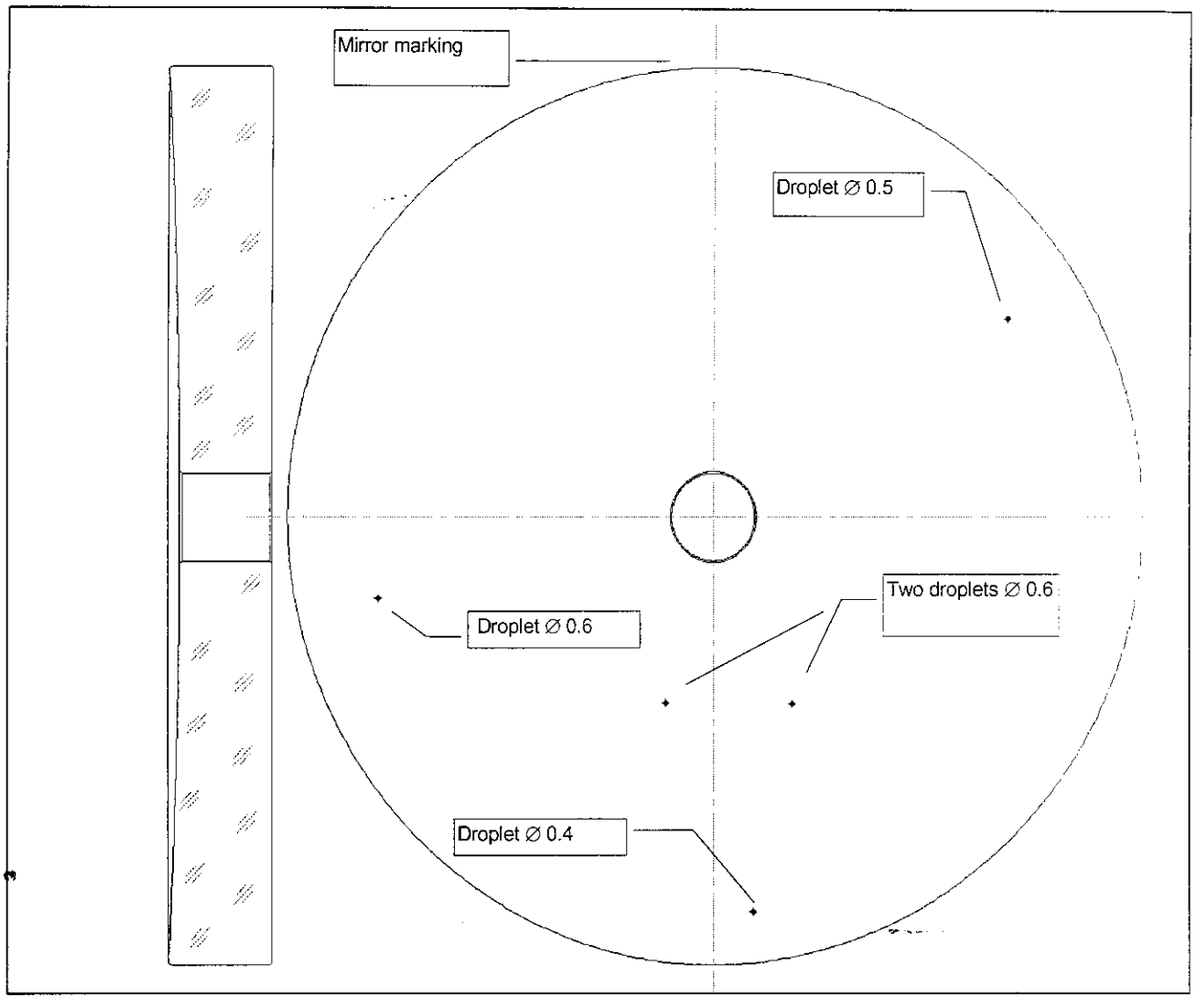
Wavelength	nominal value	measured value centre	measured value edge
350	90% $^{-3\%}$	93,80	89,03
400	89% $^{-3\%}$	92.44	85,84
450	85% $^{-3\%}$	87.85	88,60
500	86% $^{-3\%}$	86.83	90,82
550	88% $^{-3\%}$	89,27	91,53
600	89% $^{-3\%}$	90,96	91,17
650	90% $^{-3\%}$	91,40	90,13
700	88% $^{-3\%}$	90,96	88,35
750	87% $^{-3\%}$	89,73	85,70
800	85% $^{-3\%}$	87,77	82,30
850	83% $^{-3\%}$	87,29	80,90

The tolerance of the reflection measurements is ± 1.5%.



Result of the visual inspection:
The coating proved visually in excellent condition. There are a few droplets of negligible size detected on the surface. The number, size and distribution is well below the blank specification for inclusions and bubbles. There is no measurable deterioration of the reflecting capabilities of the mirror by those inclusions. The position of the Al grain droplets on the surface are mapped on the attached map.

Droplet positions map



Test certificate

Test at the completion of coating of the mirror

Secondary mirror

Jena
13.06.1997

Scope

The scope of the test is to check the quality of the coating of the newly manufactured secondary mirror for the Kottamia observatory of the National Research Institute of Astronomy and Geophysics (NRIAG).
The main task of the test is to verify, that the mirror coating has Zeiss quality.

Applicable documents

- CALL OF AN INTERNATIONAL TENDER FOR THE SUPPLY OF THE BLANK OF THE PRIMARY MIRROR FOR ITS OPTICAL FIGURING AND COATING
  November 1993
- The Supply Of The Blank Of The Primary Mirror
  Its Optical Figuring, Polishing And Coating
  Technical proposal — Carl Zeiss Jena GmbH
  January 94
- The Supply Of The Blank Of The Primary Mirror
  Its Optical Figuring, Polishing And Coating
  Commercial and Administrative Section — Carl Zeiss Jena GmbH
  January 94
- Contract No. 7 Year 1994
  Supply and Installation of the Main mirror and Subsidiary mirror for the Kottamia Astronomical Observatory
- Test plan for the 74" optics Kottamia issue 02/ March 1997

Test definition

The test is the verification of the reflection of the mirror coating in different wavelengths.

Test procedure

The degree of reflection of the mirror surface was measurede directly on the mirror surface.
The reflectance was measured at an angle of incidence of 0°.
A visual inspection of the mirror surface completed the test.

Test criteria

Coating: Aluminium with a protective coating of Silicon oxide.

Reflectance:

Wavelength	nominal value	measured value centre
350	90% $^{-3\%}$	92.0
400	89% $^{-3\%}$	88.0
450	85% $^{-3\%}$	90.0
500	86% $^{-3\%}$	87.0
550	88% $^{-3\%}$	87.0
600	89% $^{-3\%}$	89.0
650	90% $^{-3\%}$	91.0
700	88% $^{-3\%}$	88.0
750	87% $^{-3\%}$	87.0
800	85% $^{-3\%}$	84.0
850	83% $^{-3\%}$	83.0

The tolerance of the reflection measurements is ± 1.5%.

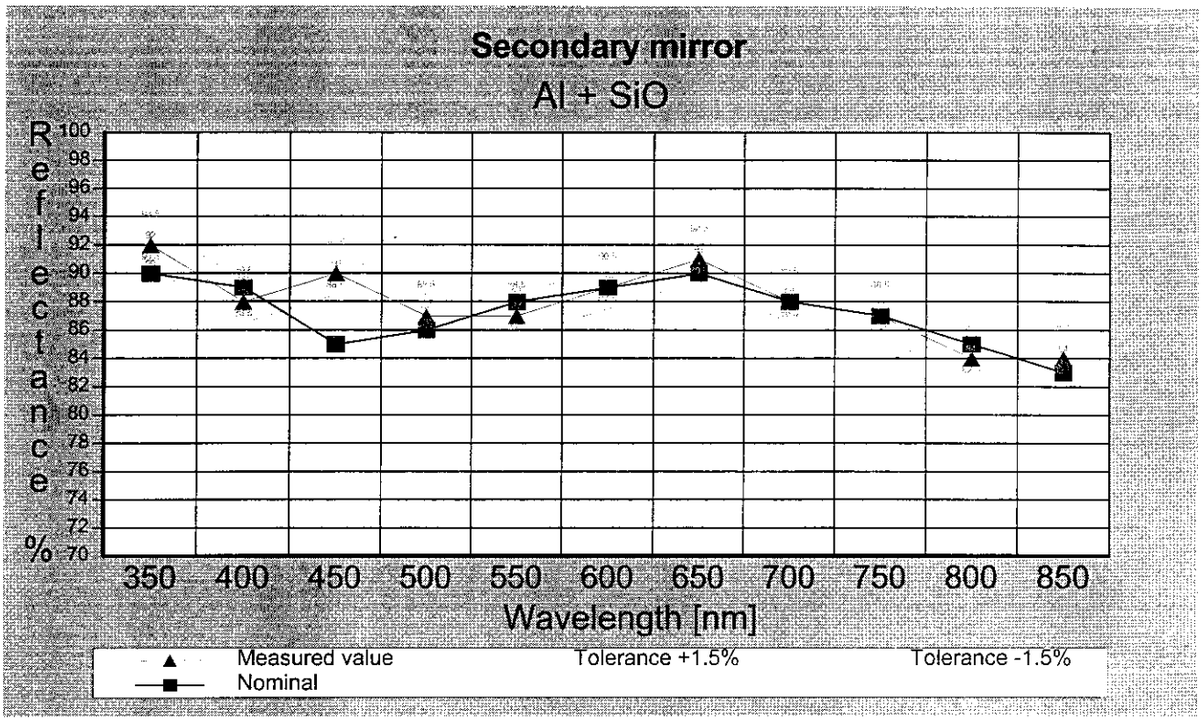
ZEISS

Carl Zeiss Jena GmbH
NRIAG Helwan/ Cairo

74" optics Kottamia

Test certificate

CZJ/Kott-Contract AG 13 95702
KOTTECE/czj



Result of the visual inspection:
The coating proved visually in excellent condition. There is a scratch in the center areal, which will be not used optically. There is no measurable deterioration of the reflecting capabilities of the mirror by this scratch.