1. Scope of Project

This specification describes a large ruled ("surface relief") transmission grating, which is to be used at wavelengths 370 - 900 nm in the Prime Focus Imaging Spectrograph on the Southern African Large Telescope (SALT).

2. Physical specifications

Plano ruled transmission grating

Grooves/mm: 300 (parallel to short edge)

Blaze angle: 17.5 ± 0.5 deg

Size: 175 x 200 x 20 mm

Clear Aperture: 154 x 180 mm

Substrate: Fused silica

Broadband AR coating: 370 - 900 nm

3. Performance specifications

Blaze wavelength: 575 ± 30 nm

Efficiency: Peak > 70%; 400 nm >30%; 900 nm > 30%

Total wavefront distortion < 1 wave @ 633 nm

AR coating: 1% maximum reflectance 370 - 900 nm

4. Substrate:

Dimensional tolerances: + 0.0mm / - 0.5 mm (sizes indicated above are maximum)

Material: Corning HPFS 7980 Grade 2F or equivalent

Front/Back parallelism: better than 2 arcmin

Surface figure @ 633 nm: 1/4 wave RMS over 4 inches

Scratch/ Dig: 40-30

220 grit edge finish

Bevel 1-2 mm

5. Documentation

Efficiency vs wavelength 400 - 900 nm, at at least 6 points and at maximum

Wavefront distortion interferogram