

Preliminary requirements specification for a set of prism-based optics for the VLT-ERIS project

v1.0, 18/December/2017

ERIS is a new instrument for the Very Large Telescope (VLT). It includes an Adaptive Optics (AO) Module requiring the following prism-based optics:

1. **LGS K-prism** – a 30deg Reversion Prism (15mmx54mmx29.5mm) for the Laser Guide Star (LGS) WaveFront Sensor (WFS) working in a F/20 monochromatic (589nm) beam;
2. **NGS K-prism** – a 30deg Reversion Prism (12mmx37mmx20.5mm) for the Natural Guide Star (NGS) WFS working in a collimated beam with 600nm-1000nm wavelength range;
3. **ADC1 double prism** – a cemented double prism (diam 20mm) used as first component of the NGS WFS Atmospheric Dispersion Corrector (ADC) to be used in a F/20 beam with 400nm-1000nm wavelength range (optimized for 600nm-1000nm);
4. **ADC2 double prism** – a cemented double prism (diam 20mm) used as second component of the NGS WFS ADC to be used in the same beam as ADC1;
5. **Periscope prism** – a 45deg rhomboid prism to be used as NGS WFS periscope in a 400nm-1000nm F/20 beam;

1 LGS K-prism

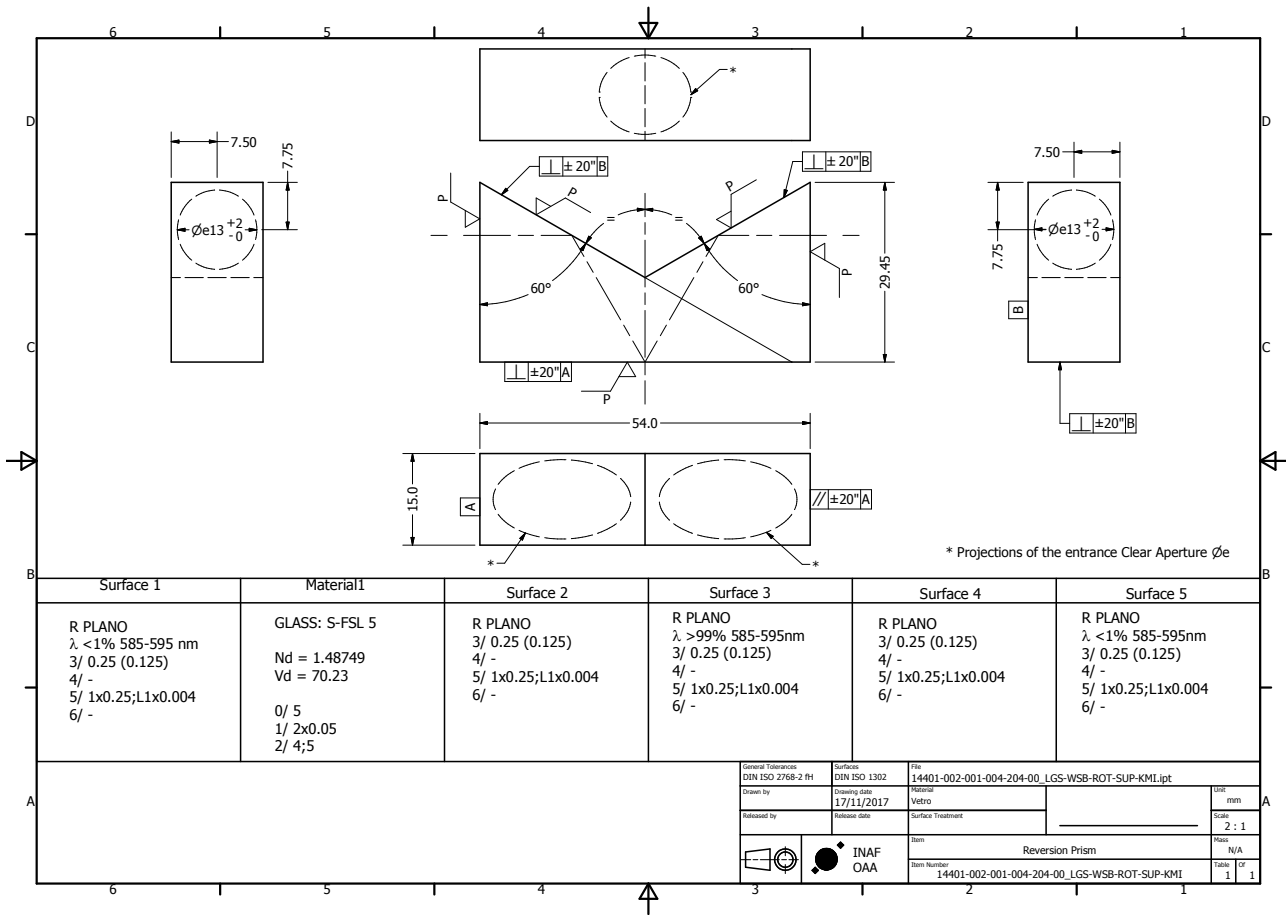
Surface 1 and 5: AR coating

Surface 3: Coating for internal reflection

Surface 2 and 4: Total Internal Reflection (TIR)

F/number: 20

Wavelength range: 585nm-595nm



2 NGS K-prism

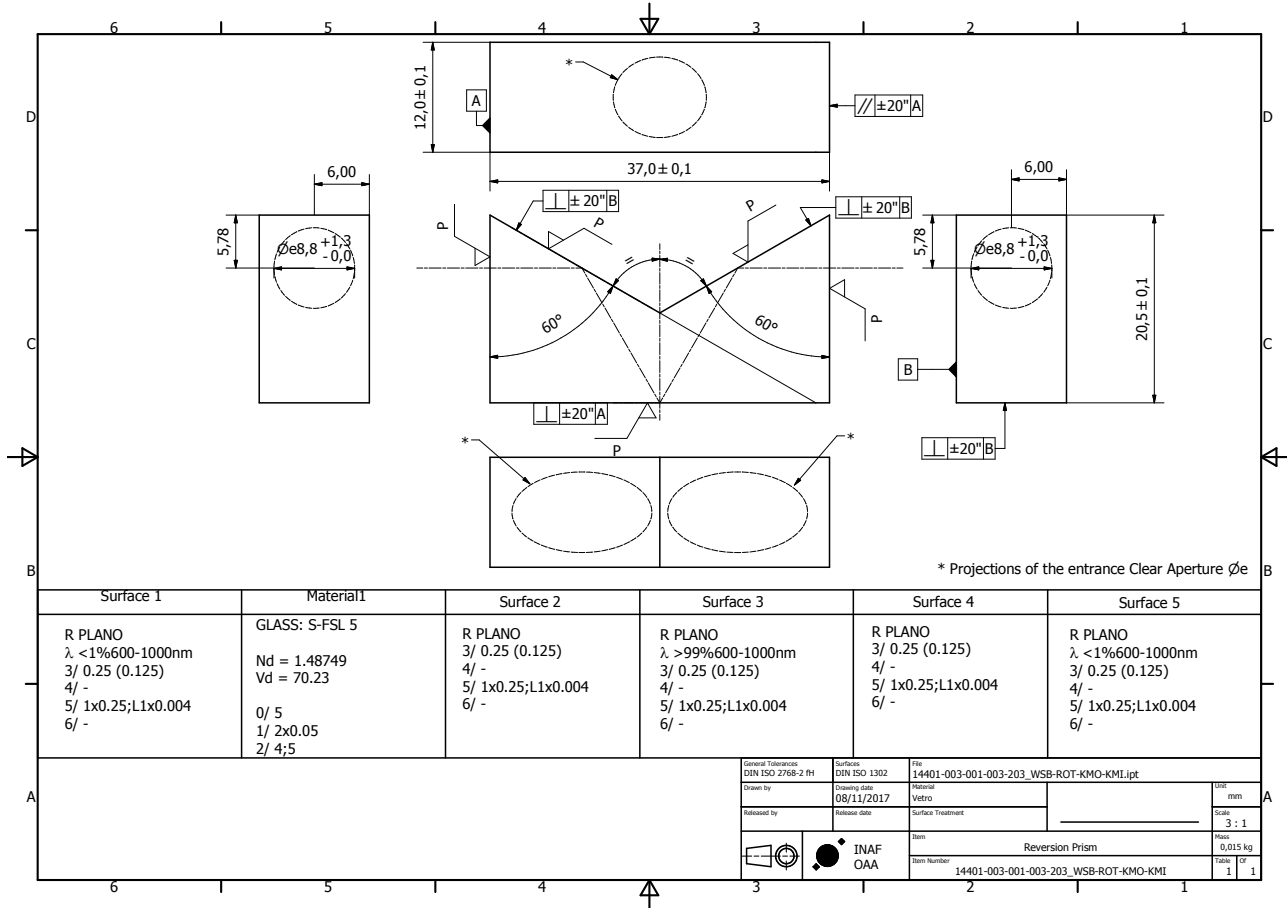
Surface 1 and 5: AR coating

Surface 3: Coating for internal reflection

Surface 2 and 4: Total Internal Reflection (TIR)

F/number: collimated

Wavelength range: 600nm-1000nm



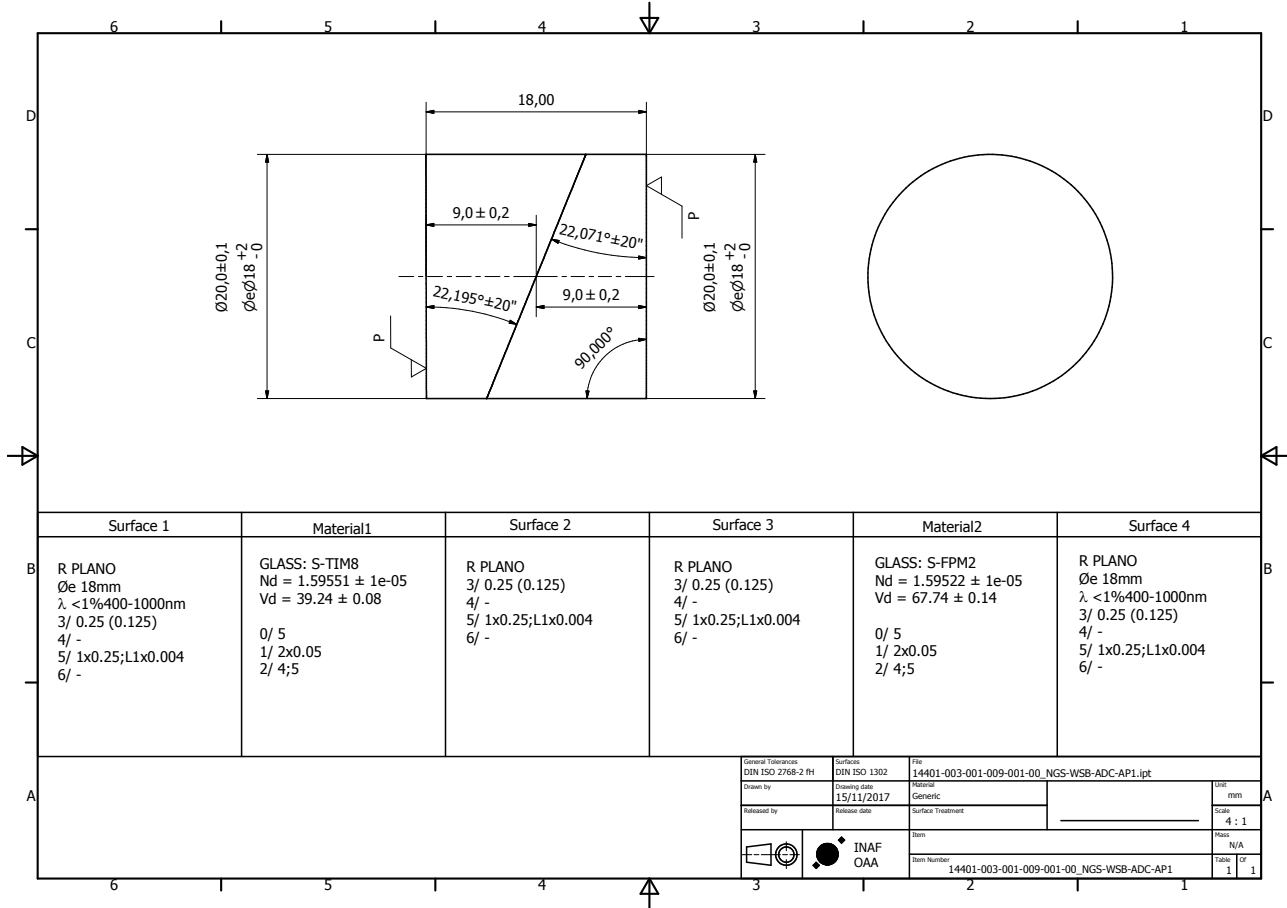
3 ADC1 Prism

Surface 1 and 4: AR coating

F/number: 20

Wavelength range: 400nm-1000nm (optimized 600nm-1000nm)

Adaptation of the prescription to glass melt data is allowed.
 The thickness in the ISO table refers to the central thickness.



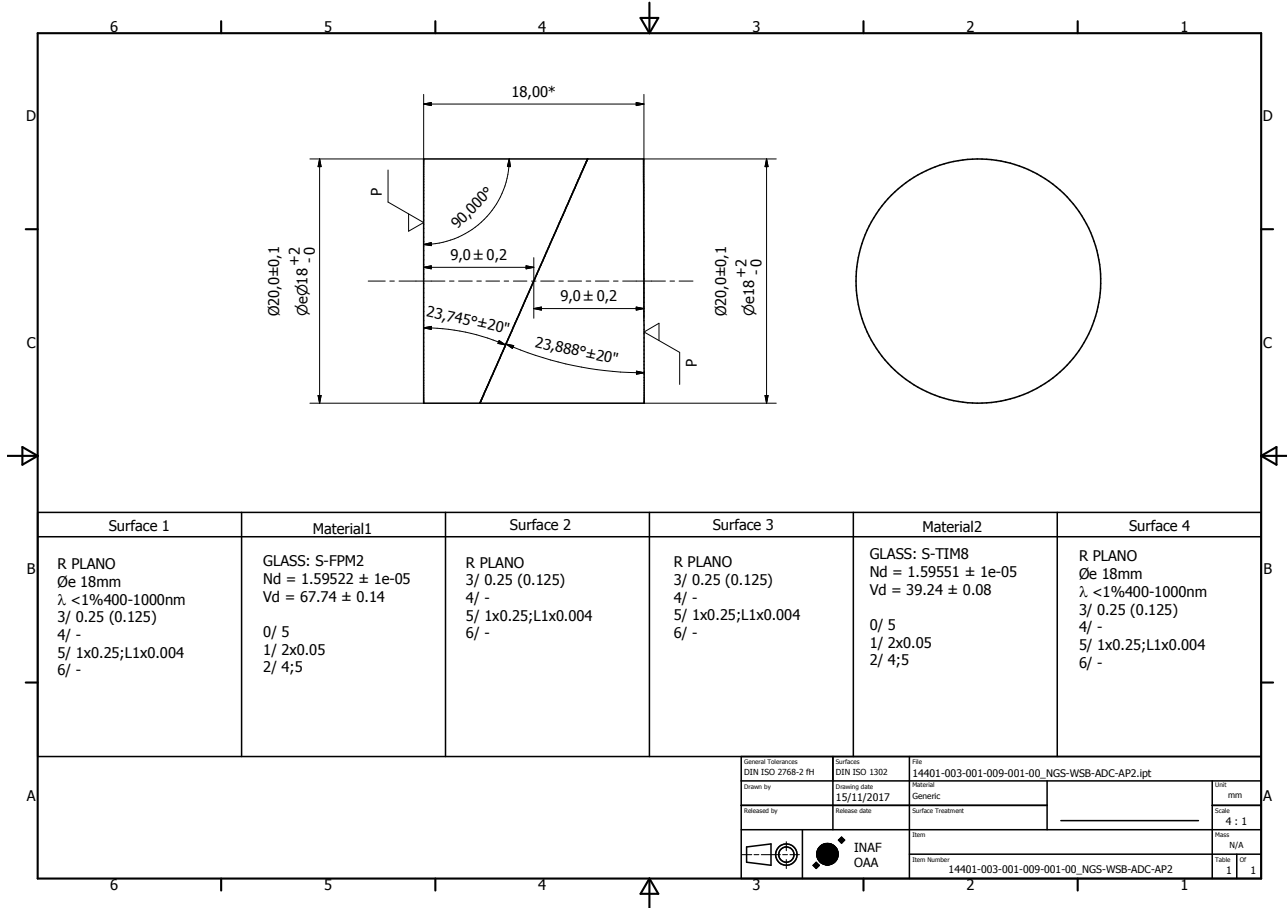
4 ADC2 Prism

Surface 1 and 4: AR coating

F/number: 20

Wavelength range: 400nm-1000nm (optimized 600nm-1000nm)

Adaptation of the prescription to glass melt data is allowed.
 The thickness in the ISO table refers to the central thickness.



5 Periscope Prism

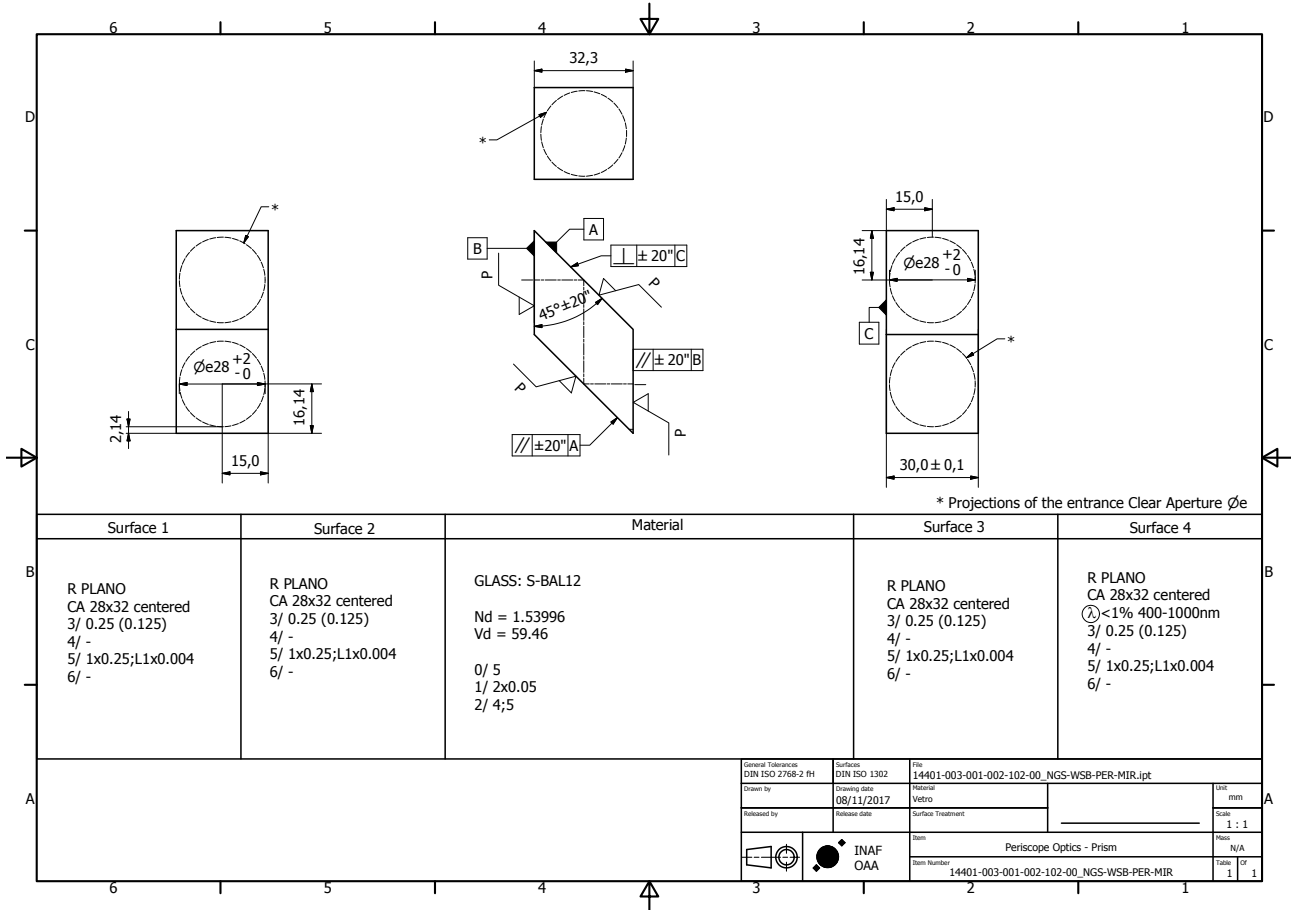
Surface 1: uncoated

Surface 2 and 3: Total Internal Reflection (TIR)

Surface 4: AR coating

F/number: 20

Wavelength range: 400nm-1000nm



6 Environmental

REQ#	Item	Specification
ENV01	Air Temperature	All requirements shall be met under the following temperature conditions: Functional air temperature range: -10 to +25°C Operational air temperature range: + 0 to +15°C Air temperature gradient at night: +0.5 to -0.9 °C/hour
ENV02	Humidity	All requirements shall be met under the following humidity conditions: Operational humidity: 0-80 % RH (not condensing).
ENV03	Storage Temperature	-30°C to +55°C

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