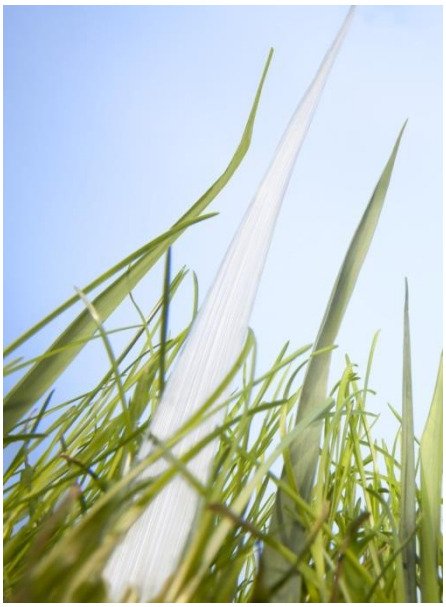
PURAVIS® GOF70

Eco-friendly High Performance Glass Optical Fiber



SCHOTT is setting new standards for illumination fiber optics with PURAVIS® premium quality glass optical fibers. For the high purity optical glasses SCHOTT utilizes its unique manufacturing capabilities.

PURAVIS® fibers feature premium transmission with low solarization and excellent color rendering with low discoloration - even with longer length - for all kind of illumination applications to provide a more realistic appearance of the illuminated objects.

Equipped with the smallest numerical aperture in the PURAVIS® family the GOF70 fiber offers aperture angles of up to 70°, depending on fiber diameter, length and wavelength. Long term-use is ensured by significantly improved chemical stability as well as low solarization sensitivity.

High optical performance combined with longevity at an economical price point make the PURAVIS® GOF70 the first choice for most standard fiber optic illumination applications.

Technical Data PURAVIS® GOF70				
Fiber Type		Step-index Multimode Fiber		
Material Core / Cladding		High Purity Optical Glass **without lead, arsenic, antimony** Fully ROHS compliant		
Biocompatibility According to DIN ISO 10993-5		Yes		
Numerical Aperture Theoretical Value at 587 nm		**0.55**		
Typical Aperture Angles 2α Fiber Diameter 70 µm at Wavelength V(λ)		1 m length: **~ 71°** 10 m length: **~ 66°**		
Optical Attenuation Measured according to DIN 58141 Part 1 Fiber Diameter 70 µm (Single Fiber)		at 450 nm < **550** dB/km at 553 nm < **250** dBkm		
Typical Values of average Production		1 m	3 m	5 m
Correlated Color Temperature (CCT) determined with CIE Standard Illuminant	A (2856 K)	*2784 K*	*2783 K*	*2583 K*
	D65 (6500 K)	*6249 K*	*5961 K*	*5725 K*
Chromaticity Coordinates determined with CIE Standard Illuminant	A (x = 0.4476) (y = 0.4074)	*x = 0.4526* *y = 0.4085*	*x = 0.4533* *y = 0.4133*	*x = 0.4578* *y = 0.4179*
	D65 (x = 0.3127) (y = 0.3290)	*x = 0.3165* *y = 0.3360*	*x = 0.3217* *y = 0.3457*	*x = 0.3268* *y = 0.3551*
Temperature Stability • Static Applications *(fibers only, may be limited by lubricants, epoxy resins or sheathing materials)* • End Surface with high Temp. Epoxy • End Surface Hot-fused		- 20°C to 200°C / - 4 F to 392 F Up to 200°C / 392 F Up to 400°C / 752 F		
Single Fiber Diameter		**30 µm, 50 µm, 70 µm ± 4 µm**		

Applications

- White Light Endoscopy
- Fluorescence Endoscopy
- Photo Dynamic Diagnostics PDD
- Medical/Industrial Spectroscopy
- White Light Microscopy
- Fluorescence Microscopy
- Sensor Applications
- Surgical Microscopy
- Industrial Sensors
- Machine Vision Illumination

Chemical Resistance Classes	
Acid Resistance Class SR (acc. to ISO 8424: 1996 [2])	**1.0**
Alkaline Resistance Class AR (acc. to ISO 10629: 1996[3])	**1.0**
Climatic Resistance Class CR (acc. to proposed standard ISO/CD13384 [1])	**1.0**
Stain Resistance Class: FR	**0**

For further details on chemical resistance classes refer to the SCHOTT publication TIE-30 “Chemical properties of optical glass”.

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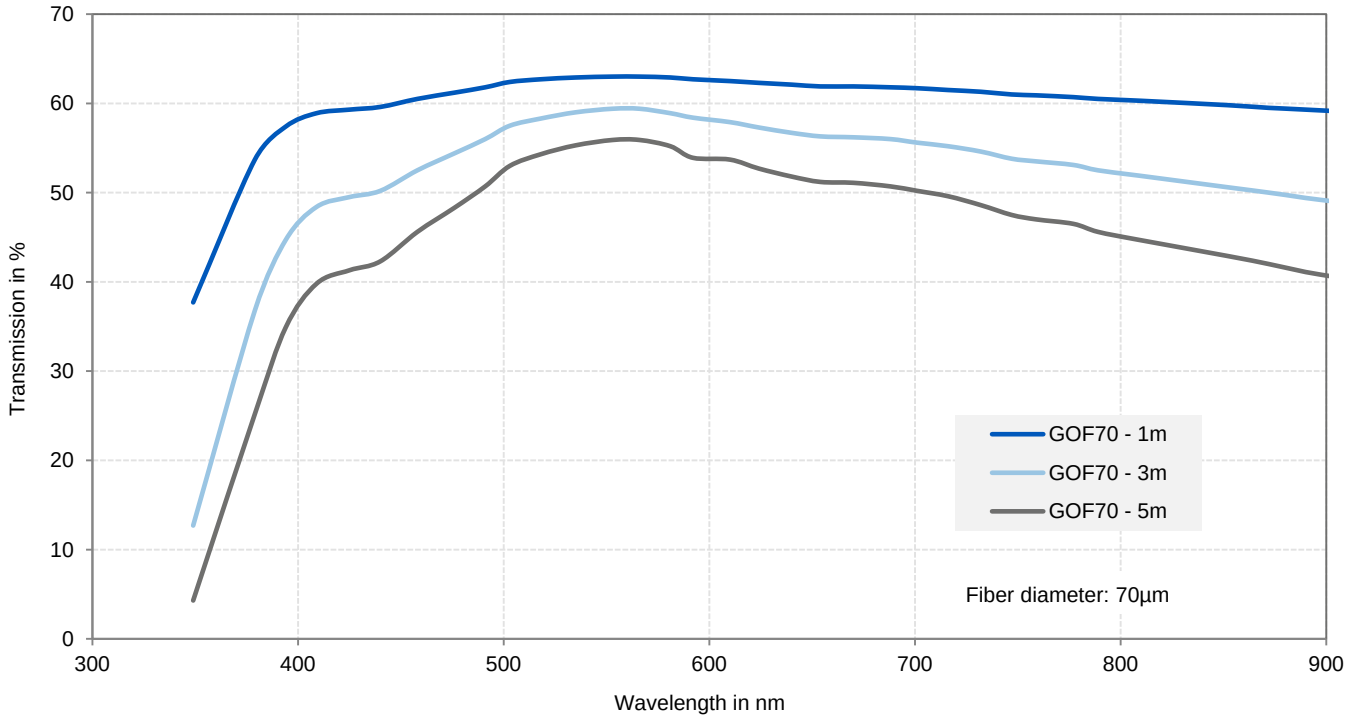
Optical Properties of PURAVIS® GOF70

Spectral Transmission

(Measured according to DIN 58 141 Part 2)

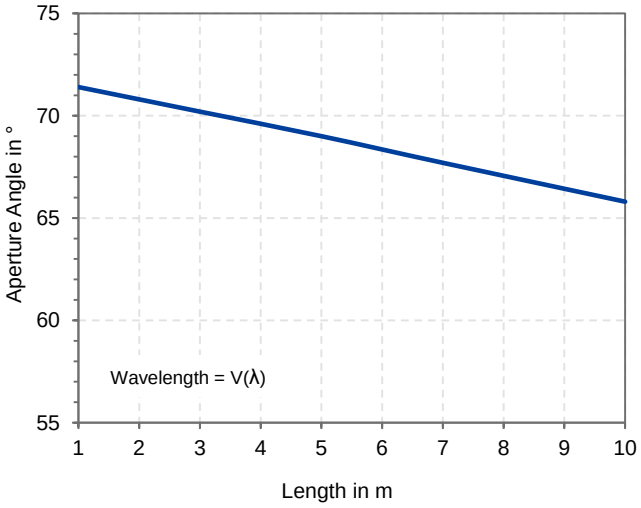
Transmission of a fiber bundle depends on the attenuation of core glass, packing fraction of fibers, core/cladding surface ratio, quality of end polish and length of the fiber bundle. The displayed transmission curves represent SCHOTT's typical manufacturing level of an average production quality for an epoxied fiber bundle with GOF70 fibers.



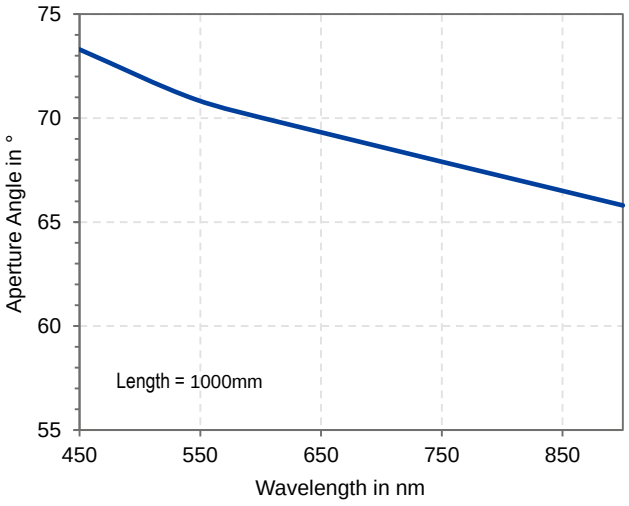
Numerical Aperture

(Measured according to DIN 58 141 Part 3)

Dependence of the aperture angle over bundle length:
The effective aperture angle of the GOF70 fiber decreases naturally with longer length.



Dispersion of the aperture angle:
The GOF70 fiber shows a low dispersion, which results in good color homogeneity of the illumination in the far field.



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Long Term Stability of PURAVIS® GOF70 – Solarization Stability

Visible Light:

Solarization stability was tested with different light sources over a time period of 450 hours (end termination hot-fused).

The PURAVIS® GOF70 shows low solarization effects with a few % in transmission losses with the tested light sources.

UV-Radiation (365 nm):

Solarization stability was tested with a UV-LED over a time period of more than 1300 hours.

Irradiation intensity: 35 mW/mm²

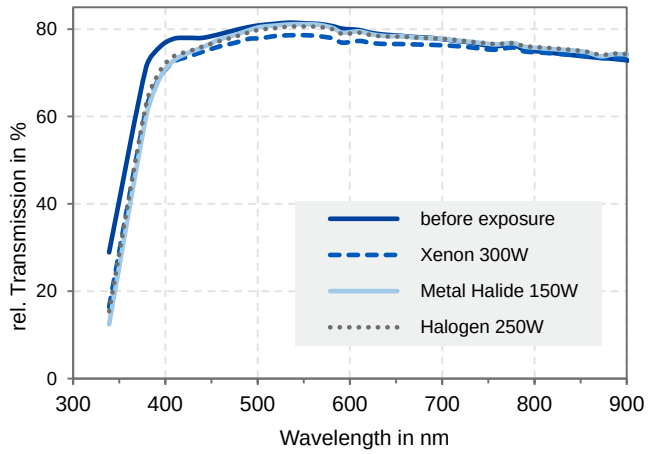
The PURAVIS® GOF70 fiber shows a very fast solarization effect, which stabilizes fast at a transmission level of 20 % at 365 nm.

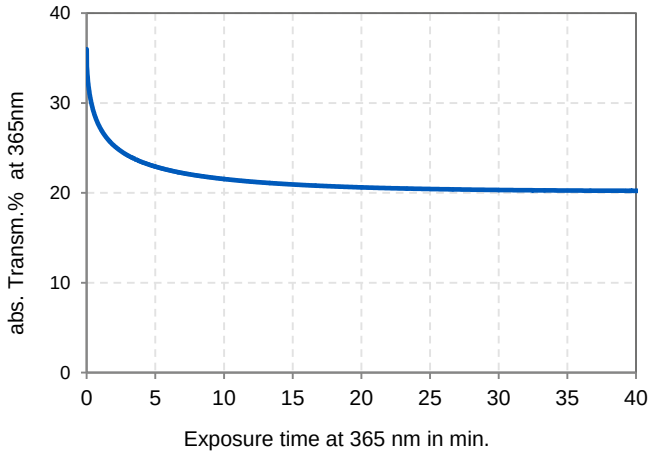
In general solarization effects are depending on several factors:

- Intensity level, respectively power density, coherency of light source
- Individual spectra, respective wavelengths (shorter wavelength may cause higher effects)
- light guide length, since some effects are length depending

Depending on the specific application further solarization tests are recommended with the intended set-up.

Please contact your SCHOTT Sales representative to discuss your individual requirements.





Long Term Stability of PURAVIS® GOF70 – Mechanical Stability

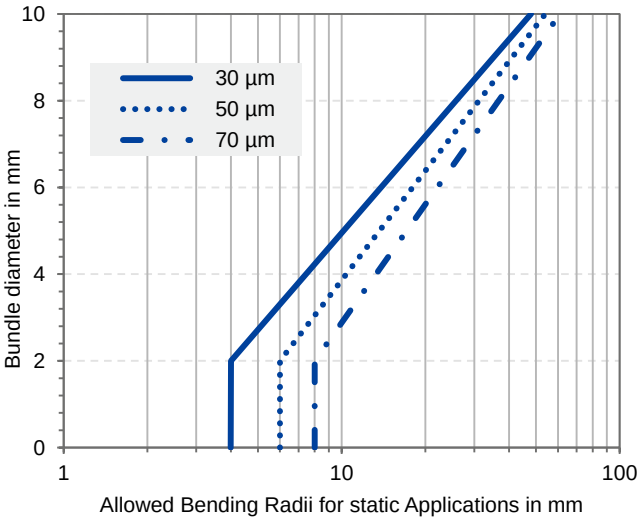
PURAVIS® Glass Optical Fibers feature high mechanical stability enabling high flexibility and very small bending radii.

Proof tests of single fibers - representing stress in axial direction – verify that the PURAVIS® fibers feature significantly reduced breakage by factor 4 in comparison to conventional SCHOTT fibers.

Loop bending tests of single fibers according to DIN 58 141- 6 show an average diameter of 1.0 mm before breakage for short term bends. For long-term (permanent) bends in static applications the graph to the right shows the recommended bending angles depending on bundle diameter for 30 µm, 50 µm and 70 µm fiber diameter.

Applications, which combine small bending radii in combination with frequent movements (torsion or drag chain movements) may require special designs.

Please contact your SCHOTT sales representative to discuss your specific requirements.



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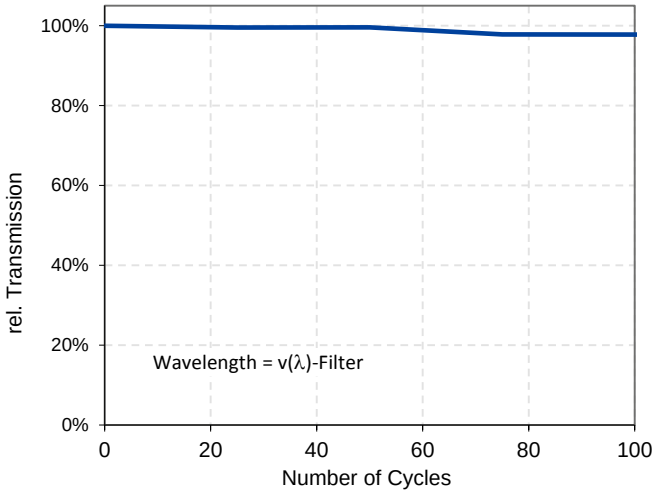
Long Term Stability of PURAVIS® GOF70 – Chemical Stability

PURAVIS® GOF70 Glass Optical Fibers show significantly improved chemical stability than SCHOTTs conventional fibers. Core and cladding glasses feature high chemical resistance, which ensure long-term stability over lifetime under repeated reprocessing cycles.

- Samples: Fiber bundle Ø 2,4 mm, length 100 mm, bonded into stainless steel tube.
- Prior to each measurement cleaning of end surface with ethanol.
- Rel. transmission measured acc. to DIN 58141 Part 2, Aperture of light beam: NA 0.1, Wavelength: λ = 535 nm

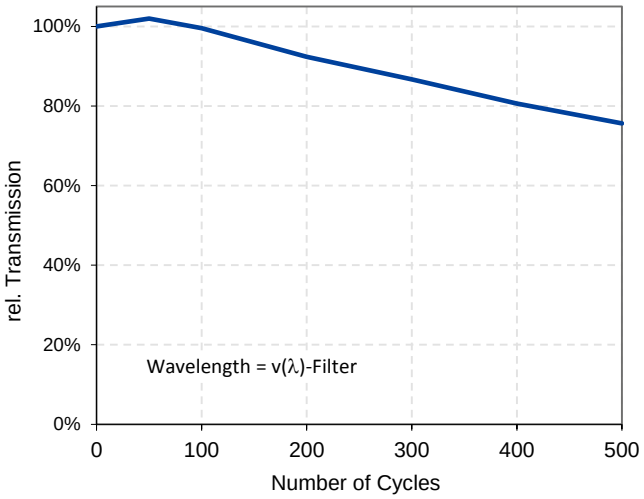
Thermal Disinfection Stability

Device	Miele Disinfektor PG8536
Program	Recommendation AKI (www.a-k-i.org)
Detergent	Neodisher FA 0,5 % V/V (5 ml/l) pH11
Neutralizer	Neodisher Z 0,1 % V/V (1ml/l)
Cycles	5 x 20



Autoclaving Stability

Autoclave	Lautenschläger Protocert 839
Program	134 °C (3 bar) sterilization time: 10 min. cycle time: 40 min.



Inquiries

SCHOTT's capabilities in light guide design and manufacturing comprise a variety of options depending on the specific application.

Capabilities comprise specific design of ferrules, biocompatible sheathings, temperature stable end terminations (hot-fused) and more.

Please contact your SCHOTT representative for a quotation of your specific light guide design containing SCHOTT PURAVIS® glass optical fibers.

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