

# PURAVIS® GOF70

## Eco-friendly High Performance Glass Optical Fiber



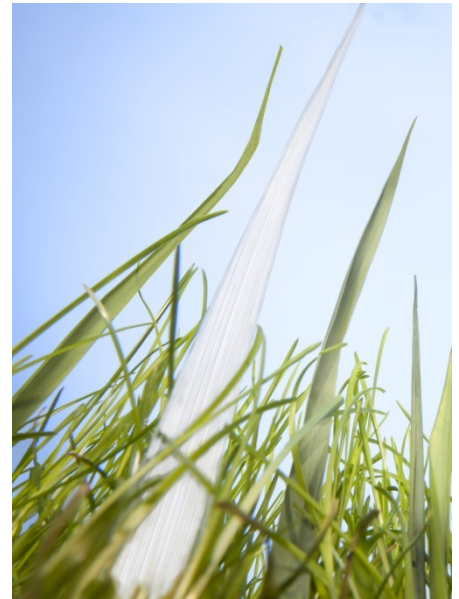
SCHOTT is setting new standards for illumination fiber optics with PURAVIS® premium quality glass optical fibers. For the high purity optical glasses SCHOTT utilizes its unique manufacturing capabilities.

PURAVIS® fibers feature premium transmission with low solarization and excellent color rendering for all kind of illumination applications.

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. Improved transmittance for wavelengths below 400 nm enables new applications like fluorescence or UV curing.

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			
<b>Fiber Type</b>	Step-index Multimode Fiber for Illumination Applications with visible Light		
<b>Numerical Aperture</b> Theoretical Value at 587 nm	0.55		
<b>Eff. Aperture Angle 2α</b> Measured for a 70 μm Fiber at V(λ) Length: 1 meter	> 65°		
<b>Optical Attenuation</b> Measured according to DIN 58141 Part 1 for a 70 μm Single Fiber	at 450nm < 550 dB/km at 553nm < 250 dBkm		
<b>Material Core / Cladding</b>	High Purity Optical Glass <b>without lead, arsenic, antimony</b> Fully ROHS compliant		
<b>Biocompatibility*</b> According to DIN ISO 10993-5	Yes (Test certificate available)		
<b>Temperature Stability</b> • Operational (epoxied End) • Operational (hot-fused End Surface)	- 20°C to 200°C / - 4 F to 392 F - 20°C to 400°C / - 4 F to 752 F		
<b>Single Fiber Diameter</b>	30 μm, 50 μm, 70 μm ± 4 μm		
<b>Chemical Resistance Classes</b>	<b>GOF70</b>	<b>B3-Fiber</b>	<b>A2-Fiber</b>
Acid Resistance Class SR (acc. to ISO 8424: 1996 [2] )	1.0	1.0	1.0
Alkaline Resistance Class AR (acc. to ISO 10629: 1996[3] )	1.0	2.3	2.3
Climatic Resistance Class CR (acc. to proposed standard ISO/CD13384 [1])	1.0	2.0	1.0
Stain Resistance Class: FR	0	0	0

Delivery Forms		
Bundle Length [m]	< 5.7	> 5.7
Lubricant: Dry (S17)		
GOF70-30μm-S17	●	
GOF70-50μm-S17	●	○
GOF70-70μm-S17	●	●
Lubricant: Glass-clad (S15)		
GOF70-30μm-S15	●	
GOF70-50μm-S15	●	
GOF70-70μm-S15	●	●
○ Availability of bundle length > 5.7m depends on minimum order volumes. For further details refer to the data sheet "Delivery Forms".		
Data on this data sheet is compared to conventional SCHOTT glass fibers.		

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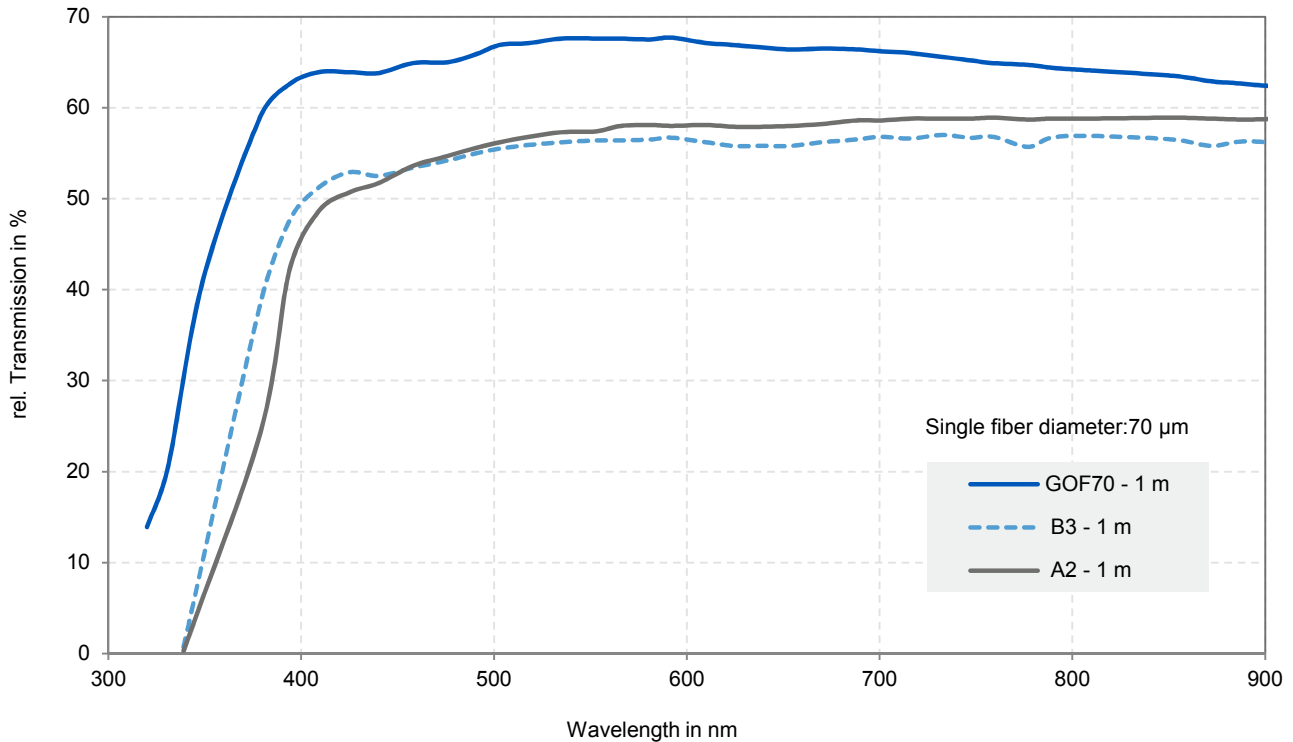


## Optical Properties of PURAVIS® GOF70

### 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 for a fiber bundle of the GOF70 fiber in comparison to the B3 and A2-fiber.



### Transmission of white Light

Today's demanding illumination applications require true white transmission for optimum color rendering. PURAVIS® GOF70 features low discoloration even with longer length, which provides a more realistic appearance of the illuminated objects.

The table below shows typical data for the correlated color temperatures (CCT) as well as chromaticity coordinates of the fibers, illuminated with the standard illuminant "D65" for xenon.

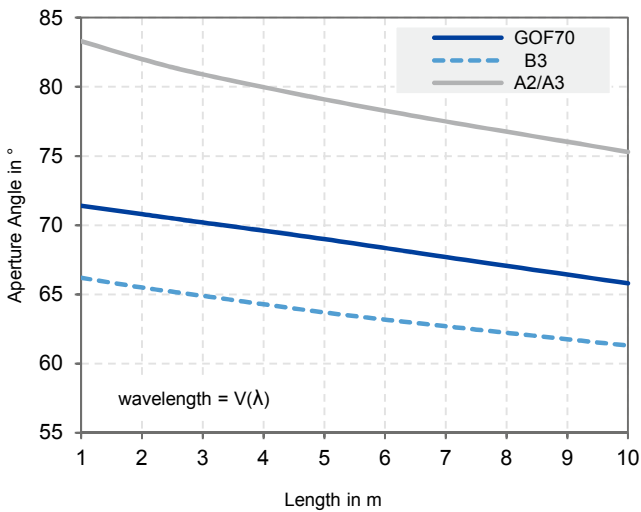
Length	Standard Illuminant „D65“ (6500 K)			Chromaticity Coordinates Standard Illuminant „D65“		
	GOF70	B3	A2	GOF70	B3	A2
1 m	6370 K	6230 K	6100 K	x = 0.3147 y = 0.3340	x = 0.3168 y = 0.3359	x = 0.3396 y = 0.3392
5 m	5880 K	5600 K	5200 K	x = 0.3231 y = 0.3519	x = 0.3295 y = 0.3573	x = 0.3410 y = 0.3714
10 m	5220 K	5100 K	4490 K	x = 0.3324 y = 0.3731	x = 0.3445 y = 0.3824	x = 0.3660 y = 0.4063

## Numerical Aperture PURAVIS® GOF70

(Measured according to DIN 58 141 Part 3)

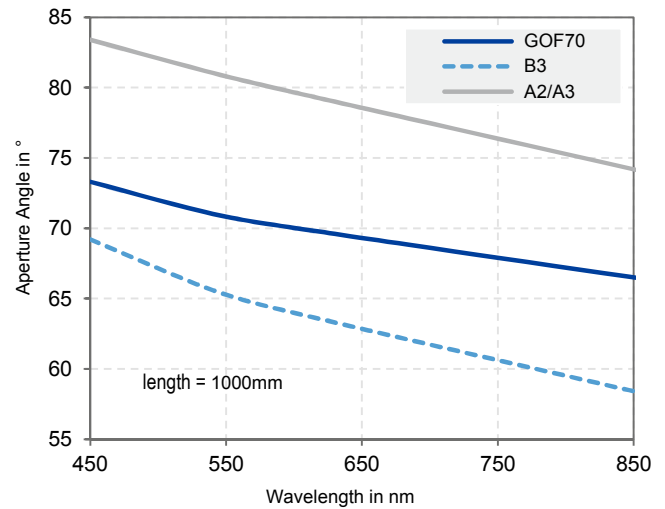
### Dependence of the aperture angle over bundle length:

The effective aperture angle of the GOF70 fiber decreases with longer length, comparably to A2 and B3 fibers.



### Dispersion of the aperture angle:

The GOF70 fiber shows a lower dispersion than A2 and B3 fibers. This results in improved color homogeneity of the illumination in the far field.

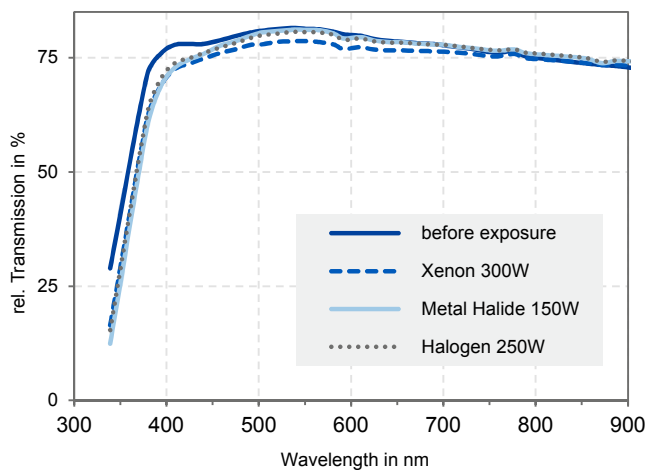


## Long Term Stability of Optical Parameter – Solarization Stability

### 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.

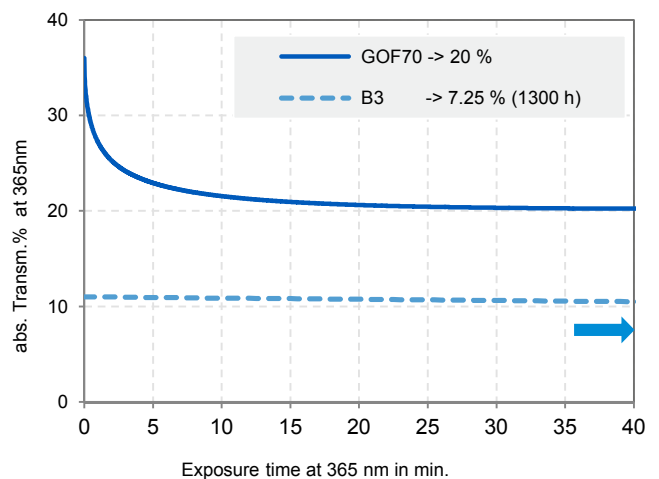


### UV-Radiation (365 nm):

Solarization stability was tested with a UV-LED over a time period of more than 1300 hours  
Irradiation intensity: 35 mW/mm<sup>2</sup>

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

In comparison, the B3 fiber shows a slower solarization effect, stabilizing at transmission levels of approx. 7% .



## Long Term Stability of PURAVIS® GOF70 – Chemical Stability

PURAVIS® GOF70 Glass Optical Fibers feature significantly improved chemical stability. Core and cladding glasses feature high chemical resistance, which ensure long-term stability over lifetime under repeated reprocessing cycles. For further details on chemical resistance classes refer to SCHOTT publication TIE-30 “Chemical properties of optical glass”

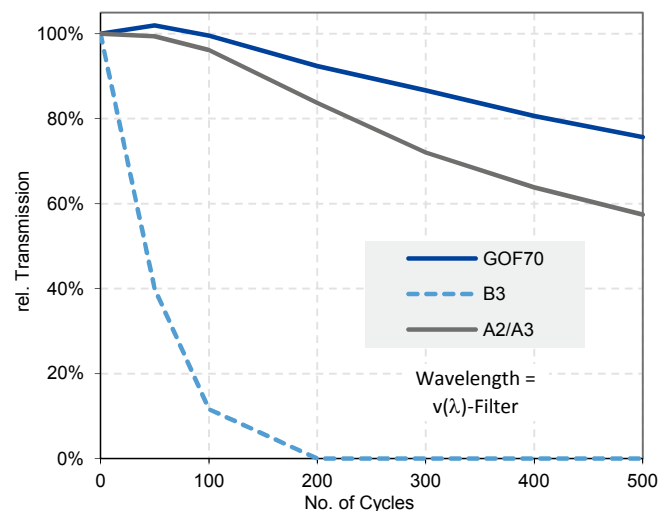
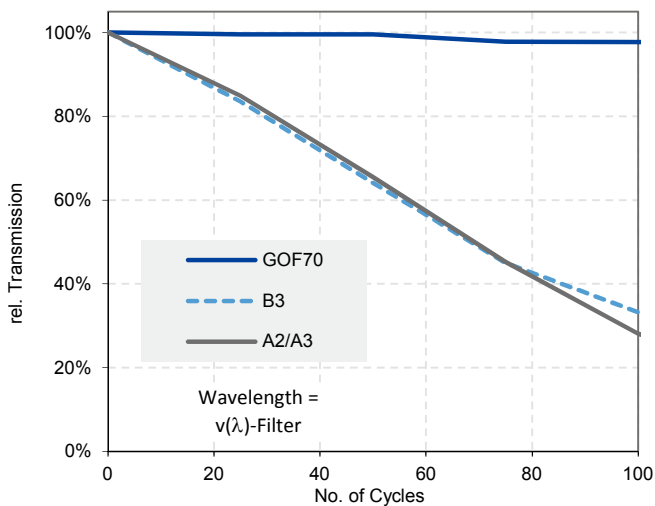
- Samples: Fiber bundle Ø 2,4 mm, length 100 mm, bonded into stainless steel tube.
- Prior to each measurement cleaning of end surface with ethanol.
- Rel. transmission measured acc. to DIN 58141 Part 2, Aperture of light beam: NA 0.1, Wavelength:  $\lambda = 535 \text{ nm}$

### 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.



## 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 - simulating stress in axial direction - show that the PURAVIS® fibers feature significantly reduced breakage by factor 4 in comparison to the 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) require special designs. Please contact your sales representative for further information.

