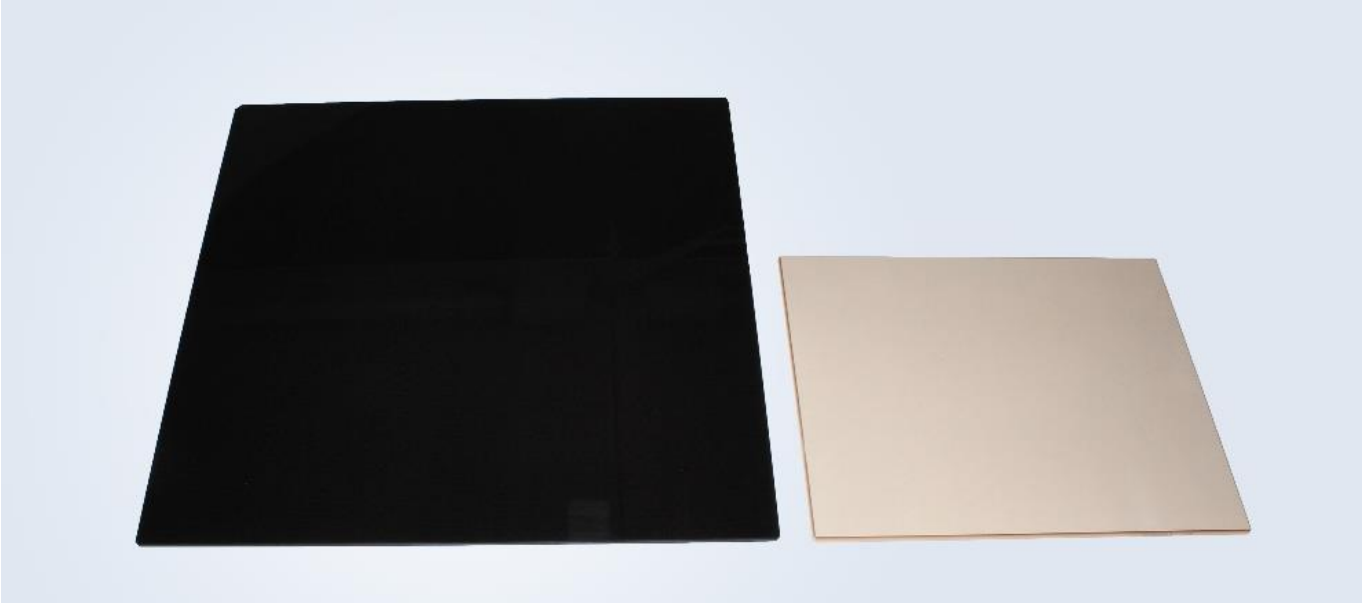
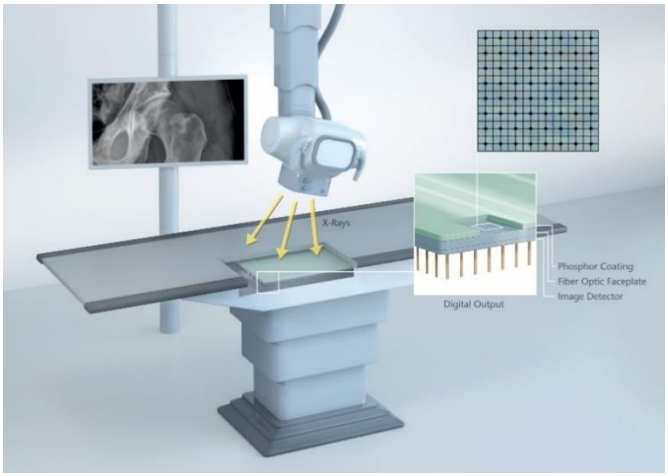
SCHOTT® Fiber Optic Faceplates





Fiber Optic Faceplates are used for high resolution 'zero thickness' image transfer applications.

Fiber Optic Faceplates can be coupled to CCD, CMOS and OLED devices to enable image intensification, remote viewing, field flattening and x-ray imaging.

Characteristics

In opto-electronic applications, coated faceplates are used as both input and output high resolution image transfer windows.

- Variety of sizes up to 320 x 320 mm.
- Fiber size from 2.5 µm to 25 µm or larger in fiber diameter.
- Core/clad options to vary transmission and contrast.
- Hermetically tight.
- Radiation-hardened materials available.
- Faceplate sizes are intended to serve the digital x-ray market as well as displays for commercial and defense applications.

Your Advantages

In some applications, the x-ray absorption properties of the fiber optic plates protect the photodetectors from damage and prevent electronic noise affecting the images.

- All SCHOTT faceplates are fabricated to customer-specific requirements.
- Faceplates are of a single piece construction (no tiling)
- Typical shapes are round or rectangular.

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Typical Performance Parameters for Faceplates

Specifications									
Glass systems*	47 A	47 AHT	47 ARH	RFG 88	24 A	24 AS	24 C	75 A	75 C
Typical fiber sizes µm/(lp/mm)**	6/102 4/128	6/83	6/102 12/32	6/102 4/128	25/23 10/64 8/72 6/102	8/72 6/102 4/128 2.5/203	10/64 6/102 4/128	27/23	6/102
Numerical Aperture	1.0	1.0	1.0	0.88	1.0	1.0	1.0	0.58	0.58
Stray Light Control (EMA)***	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No
Collimated Transmission in % @ 550nm (3 mm)	73	85	69	73	70	75	86	60	95
Coefficient of Thermal Expansion ($x10^{-7}$/°C)	68	70	68	63	68	68	68	61	61
Density (g/cm^3)	4.15	4.5	4.15	3.41	4.0	4.0	4.0	3.05	3.05
Typical Core/Clad Ratios	75/25	90/10	75/25 90/10	70/30	70/30	70/30	70/30	60/40	75/25
Lead Free	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes
Phosphor Compatible	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Maximum Square Formats (mm)	320	320	320	320	320	320	320	320	320

*Naming convention:

47, RFG 88, 24, 75	Glass system families
A	With EMA***
C	Without EMA***
HT	High transmission, due to higher core fraction option (90/10 core/clad)
S	Additional processing is performed to improve optical quality (especially shear distortion)
RH	Radiation Hardened

**Resolution is measured in line pairs (lp) per mm with a 1951 USAF Resolution Target using diffuse white light illumination. Resolution may vary with other wavelengths.

***EMA: Extra-Mural Absorption, incl. black fibers that absorb stray light

A note on pixel size vs. fiber size:
Ideally, the sensor's (or another optical element's) pixel size dictates the overall system resolution. This can be achieved if the fiber size is smaller than that of the sensor's pixels. Keep in mind that optical effects such as Moiré patterning will also affect resolution. In the best case, the fiber is 2x smaller than the pixel size and/or fiber orientation is at a bias to pixel orientation to mitigate such effects. Continuing to decrease fiber size from here does not help overall system resolution because the image will take on the resolution of the optical element with the lowest resolution.
Example: The ideal fiber size for a sensor that has 14µm pixel size is ≤7µm → 6µm is the best option.

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