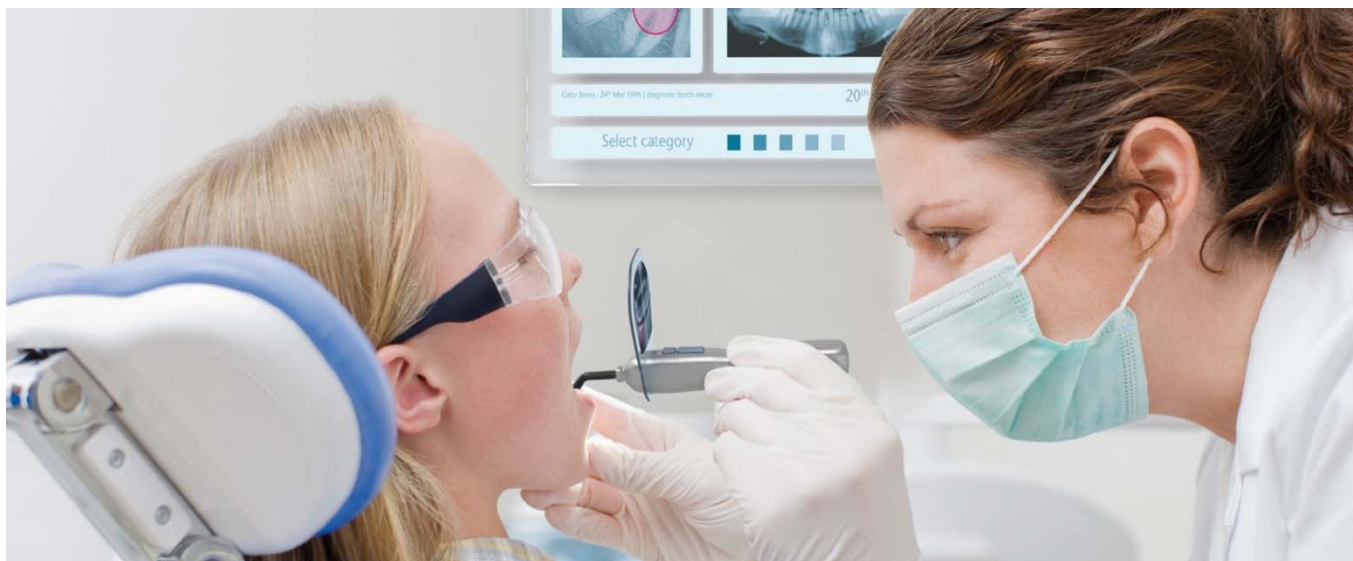


# SCHOTT Rigid Light Guides for Dental Curing

Lead-free Fiber Optic Rods



Excellent transmission and resistance to sterilization make SCHOTT fiber rods the first choice for dental curing applications.

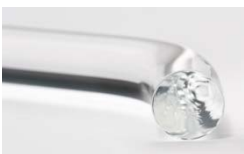
## Multi Core Rods: SCHOTT MCR

- Light transmission for dental curing, phototherapy and diode laser systems
- Consist of multiple fused core/clad systems
- Customized designs enabled by the excellent forming properties of SCHOTT glass:
  - Cone shape for beam shaping or increased light flux at the area of treatment
  - Bending for easy access



## Single Core Rods: SCHOTT SCR

- Consist out of a high index core with a low index cladding
- Homogenization of light beam



Technical Data			
<b>Type of SCHOTT® Rod</b>	<b>SCR-3</b> (LST 3)	<b>MCR-7</b> (FST 7)	<b>MCR-4</b> (FST 4)
<b>Core Type</b>	single	multi	multi
<b>Color Outer Clad</b>	clear	clear	brown black
<b>Numerical Aperture</b>	0.6	0.6	0.6
<b>Eff. Acceptance Angle</b> according to DIN 58 141 Part 3 Theoretical value at $\lambda = 587.6 \text{ nm}$	73°	73°	73°
<b>Lead-free</b> Compliant to RoHS directive EU 2002/95/EC	yes	yes	yes
<b>Biocompatibility</b> According to DIN ISO 10993-5	yes	yes	yes
<b>Temperature</b> <b>Operational</b> (glass rod only) <b>Storage/Transport</b>	- 20°C/-4°F ... +350°C/662°F - 20°C/-4°F ... +70°C/158°F		

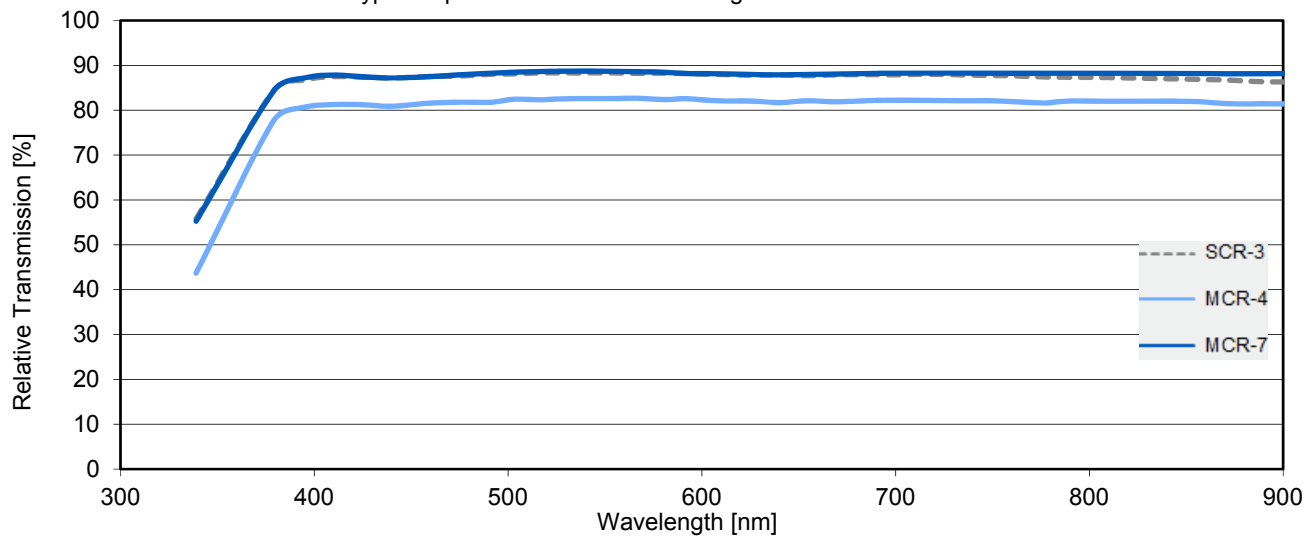
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**Transmission** (Measured in accordance with DIN 58 141 Part 2)

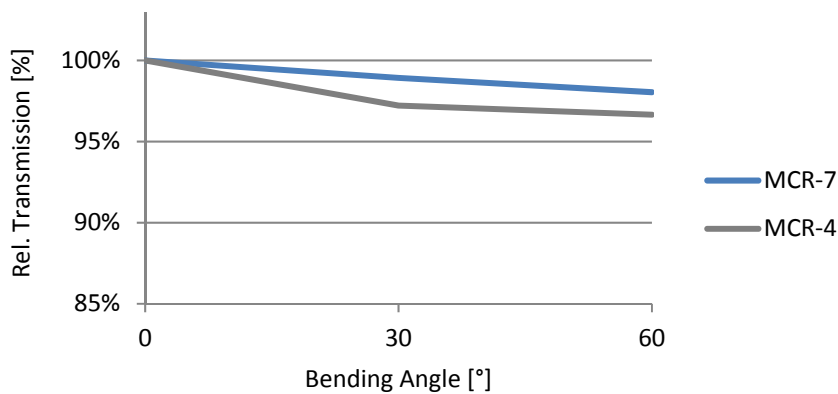
The transmission curves displayed below represent SCHOTT's typical manufacturing level for SCHOTT MCR and SCR and is monitored in the wavelength range between 460 and 660 nm.

Typical Spectral Transmission for Rigid Fiber Rods



**Dependence of Transmission on Bending Angle**

The transmission of a straight SCHOTT MCR changes after bending. The effect depends on the bending angle as displayed in the graph to the right.



Lead-free fiber optic rods



## Long Term Stability

SCHOTT fiber rods feature high chemical resistance and are easily autoclavable while maintaining their excellent performance. This not only guarantees the robustness of your products but also ensures best hygiene throughout the product life – an important requirement to comply with regulatory standards.

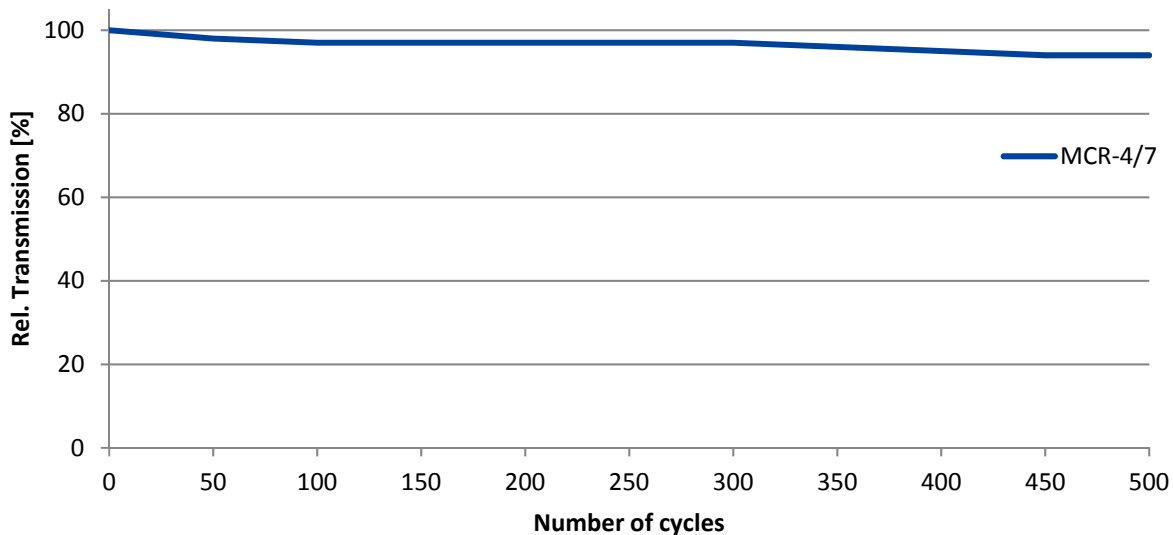
### Validation of long-term Stability by Optical Measurement

- Relative Transmission measured in accordance with DIN 58 141 Part 2
- Aperture of light beam: 0.1
- Measurement wavelength:  $\lambda = 535 \text{ nm}$
- Prior to each measurement: Cleaning of end surface with ethanol

### Sample preparation:

- SCHOTT® MCR-7 rods
- Diameter: 10 mm
- Length: 85.6 mm (Straight)

## Long Term Stability



## Test Conditions

Autoclave

- Lautenschläger Protocert 839

Autoclaving program

- Temperature/pressure: 134 °C at 3 bar
- Sterilization time: 10 min
- Cycle time: 17 min

## Design Options

### Straight Rods

- Length: 2.5 mm .... 1000 mm
- Diameter: 1 .... 14 mm

### Fiber Optic Cones

Straight SCHOTT® MCR can be drawn into a cone shape to increase intensity in a smaller spot diameter.

**Please note:** Changing the diameter from input to output changes the original acceptance angle of the rod material.

- Examples of curing rods: 13 to 8 mm, 8 to 4 mm, 6 to 2 mm diameter

### Bent Rods

Straight or conical-shaped SCHOTT MCR can be bent into angled shapes. Most common are bends of up to 60°. Depending on the diameter of the raw rod radii of the bent rods range from 5 to 12 mm.

- Common rod diameters: 4, 6, 8, 10, 13 mm
- Design recommendation for minimum length of short leg "A":

Bending Angle \ Diameter	B = 50°	B = 60°	B = 70°
4 to 6 mm	13 ± 2	13 ± 2	13 ± 2
8 mm	14 ± 2	14 ± 2	15 ± 2
10 mm	16 ± 2	16 ± 2	17 ± 2
13 mm	19 ± 2	20 ± 2	20 ± 2

### Ferrules

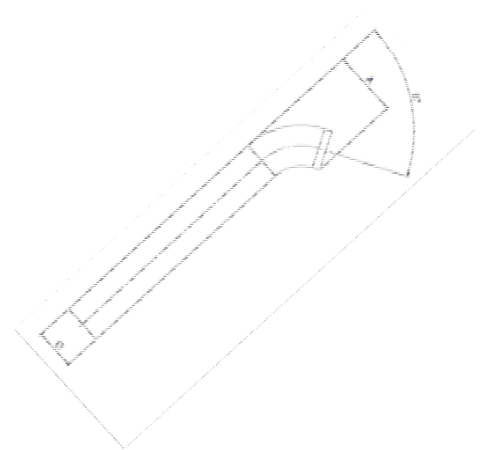
- Customer specified ferrules, made from stainless steel, German silver or polymers, can be glued onto the rod.
- Polymer ferrules can be added directly onto the rod with an injection molding process.

### Printing

Customer specific information can be printed onto the rods. Different colors are available

### Coating

Anti-reflective coatings on end surfaces are available upon request.



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