

## Multimode Fiber Cables MMC

for UV/VIS or VIS/NIR



### FEATURES

Multimode fiber cable with customer-specified fiber connectors.

- Wavelength ranges UV/VIS or VIS/NIR
- Core diameters 50  $\mu\text{m}$  - 300  $\mu\text{m}$
- Fiber patch cable available with buffer or as  $\varnothing$  3 mm cable with Kevlar strain-relief
- Customer-specified connectors type FC, DIN or AVIO, E2000, ST (only 0°-polish), or F-SMA (only 0°-polish) with 0°-polish or 8°-polish
- Amagnetic titanium connectors for connectors of type FC PC or FC APC

- Multi-mode fiber



## DESCRIPTION

Multimode fiber cable with customer-specified fiber connectors.

### Fiber

The multimode fibers are either graded (gradient index, GRIN) index or step index fibers with an [NA](#) specified by the fiber manufacturer. Schäfter+Kirchhoff offer pure silica core fibers with core diameter is 50  $\mu\text{m}$  - 600  $\mu\text{m}$ . There are fibers suitable for either the wavelength range UV/VIS or for the wavelength range VIS/NIR.

**Fiber Cable**

All fiber lengths can be customer specified. The multimode [fiber cables](#) are offered with buffer in black, or a Ø 3 mm cable in black with Kevlar strain-relief.

**Fiber Connectors**

For each fiber end the fiber connectors can be selected from a wide range of [connector types](#) (FC, DIN or AVIO, E2000, ST (only 0°-polish), or SMA-905 (F-SMA) (only 0°-polish) with 0°-polish or 8°-polish. All fiber connectors of type FC assembled by Schäfter+Kirchhoff have an alignment index (key). The wide key (type "N") fiber connector has an alignment index (key) of 2.14 mm width. The narrow key (type "R") fiber connector has an alignment index (key) of 2 mm width. Special fiber connectors are available so that the fiber cable is vacuum compatible down to  $10^{-7}$  mbar (only Ø 900 µm buffer fiber cables).

**Amagnetic fiber connectors**

For FC PC or FC APC type connectors [amagnetic versions](#) completely made of titanium can be selected. Those connectors have a ceramic ferrule. The relative permeability  $\mu_r$  of the connector is near 1 ( $\chi = 5 \cdot 10^{-5}$ ,  $\mu_r = 1.00005$ ), making it transparent to magnetic fields.

## ORDER OPTIONS

	Type	Core Diameter	Wavelength Range	Numerical Aperture	Suitable for Vacuum Feed-throughs
MMC-S-UV/VIS-50-NA022	Step index	50 µm	UV - VIS	0.22	x
MMC-S-VIS/NIR-50-NA022	Step index	50 µm	VIS - NIR	0.22	x
MMC-G-VIS/NIR-50-NA020	Graded index	50 µm	VIS - NIR	0.20	x
MMC-S-VIS/NIR-62.5-NA027	Graded index	62.5 µm	VIS - NIR	0.27	x
MMC-S-UV/VIS-105-NA022	Step index	105 µm	UV - VIS	0.22	x
MMC-S-VIS/NIR-105-NA022	Step index	105 µm	VIS - NIR	0.22	x
MMC-S-UV/VIS-200-NA022	Step index	200 µm	UV - VIS	0.22	
MMC-S-VIS/NIR-200-NA022	Step index	200 µm	VIS - NIR	0.22	
MMC-S-VIS/NIR-300-NA022	Step index	300 µm	VIS - NIR	0.22	
MMC-S-UV/VIS-400-NA022	Step index	400 µm	UV - VIS	0.22	
MMC-S-VIS/NIR-400-NA022	Step index	400 µm	VIS - NIR	0.22	
MMC-S-UV/VIS-600-NA022	Step index	600 µm	UV - VIS	0.22	
MMC-S-VIS/NIR-600-NA022	Step index	600 µm	VIS - NIR	0.22	

For a complete Order Code additional information such as cable type, cable length, and connector type are necessary. Please contact us.

## TECHNOTES

- [Special features of Multi-mode fibers](#)  
[Typical Spectra, graded vs step index, etc.](#)
- [Multimode fiber coupling](#)  
[Selection of focal length](#)
- [Collimating multimode fibers](#)  
[Collimated beam diameter and divergence](#)
- [Producing spots by refocussing multimode fiber collimators](#)  
[Calculation of spot diameter](#)

[Fiber Patch Cable Types](#)

[Details on the structure of 3 mm and 900 µm fiber cables.](#)

▪ [Fiber Connector Options](#)

[FC, AVIM and E2000](#)

## FAQ

### Connector Type FC PC and FC APC

#### How do I attach a fiber cable?

To prevent damage to the sensitive fiber end-face, always insert the fiber connector's ferrule at an angle, with the connector key properly aligned to the receptacle notch. When the ferrule tip is safely located in the inner cylinder of the receptacle, align the connector to the receptacle axis and carefully introduce the connector into the fiber coupler.

Then, orient the connector key in a way that it is pressed gently onto the right-hand side of the receptacle notch ("right-hand orientation rule").

Gently screw on the connector cap nut onto the receptacle until it is finger-tight.

Gently tighten the fiber grub screw to reduce the free play of the ferrule in the receptacle.

#### What is the "right-hand orientation rule"?

When the ferrule tip is safely located in the inner cylinder of the receptacle, align the connector to the receptacle axis and carefully introduce the connector into the fiber coupler.

Then, orient the connector key in a way that it is pressed gently onto the right-hand side of the receptacle notch.

The tightened grub screw and the "right-hand orientation rule" for the connector, ensure a high reproducibility in mode field position and angle, which is especially important for attaching and reattaching polarization-maintaining fibers reproducibly.

**Can I attach a narrow key fiber cable to a fiber coupler with a wide key receptacle?**

Yes, you can- without any problem. Simply adhere to the "right-hand orientation rule".

Generally, with any FC PC or FC APC type connector there is a freeplay when inserting the fiber into the fiber coupler. The free play in between the connector ferrule and receptacle is only a few microns, but necessary for inserting the ferrule without force. There is a difference between the receptacle and key width for wide key (2.14 mm) and narrow key (2.0 mm) fibers. If you follow the so-called "right-hand orientation rule" you can reproducibly attach and reattach even PM fibers with narrow key receptacle to fiber couplers with wide key receptacle without difficulty.

"Right-hand orientation rule":

When the ferrule tip is safely located in the inner cylinder of the receptacle, align the connector to the receptacle axis and carefully introduce the connector into the fiber coupler. Then, orient the connector key in a way that it is pressed gently onto the right-hand side of the receptacle notch. The tightened grub screw and the "right-hand orientation rule" for the connector, ensure a high reproducibility in mode field position and angle, which is especially important for attaching and reattaching polarization-maintaining fibers reproducibly.

**Can I use an end cap fiber with a mating sleeve?**

Since the radiation has already started to diverge within the end cap, a simple mating is no longer possible. Please use a [fiber-to-fiber coupler](#) in this case.

**What is the minimum bend radius for my fiber cable?****Do you have a Ø 900 µm cable?**

If yes, then the min. bend radius is 15 mm. More information can be found [here](#).

**Do you have a Ø 3 mm cable?**

If yes, then the min. bend radius is 40 mm. More information can be found in the drawing [here](#).

## RELATED PRODUCTS

<b>FIBER CABLES PMC</b>	Polarization-maintaining fiber cables
<b>FIBER CABLES SMC</b>	Single-mode fiber cables
<b>FIBER COUPLER MULTI-MODE</b>	Fiber Coupler for multi-mode fiber cables.
<b>FIBER COLLIMATORS MULTI-MODE</b>	Fiber Collimators for collimating light exiting a multi-mode fiber cable

This is a printout of the page <https://sukhamburg.com/products/fiberoptics/fibercable/mm.html> from 5/5/2024

## CONTACT

**For more information please contact:**

**Schäfter + Kirchhoff GmbH**

**Kieler Str. 212**

**22525 Hamburg**

**Germany**

**Tel: +49 40 85 39 97-0**

**Fax: +49 40 85 39 97-79**

**[info@sukhamburg.de](mailto:info@sukhamburg.de)**

**[www.sukhamburg.com](http://www.sukhamburg.com)**

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