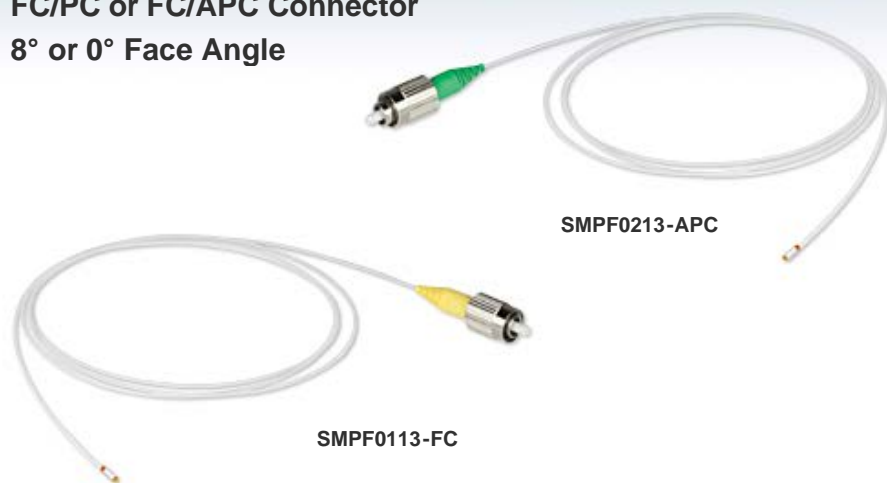


SMPF0213-FC - September 14, 2017

Item # SMPF0213-FC was discontinued on September 14, 2017. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

SINGLE MODE PIGTAILED FERRULES WITH CONNECTORS

- ▶ AR Coated Ferrules to Reduce Back Reflections
- ▶ Ø1.8 mm Ferrule is Easy to Handle
- ▶ FC/PC or FC/APC Connector
- ▶ 8° or 0° Face Angle



OVERVIEW

Features

- AR Coating for 633, 830, 1064, 1310, and 1550 nm or 1310/1550 nm
- FC/PC or FC/APC Connector
- Designed for Easy Pairing with GRIN Lenses
- 8° or 0° Face Angle
- Ideal for Telecom Applications

Thorlabs' Single Mode Pigtailed Ferrules with Connectors are designed to be paired with our GRIN lenses. In contrast to our pigtailed aspheric lenses and jacketed GRIN collimators, this product family allows the combination of GRIN lens and pigtailed ferrule to be individually chosen, satisfying a wide range of experimental requirements. See the image to the right for an example of an assembled device, or use the *Selection Guide* and diagrams below to choose compatible lenses and pigtailed ferrules for your specific application.

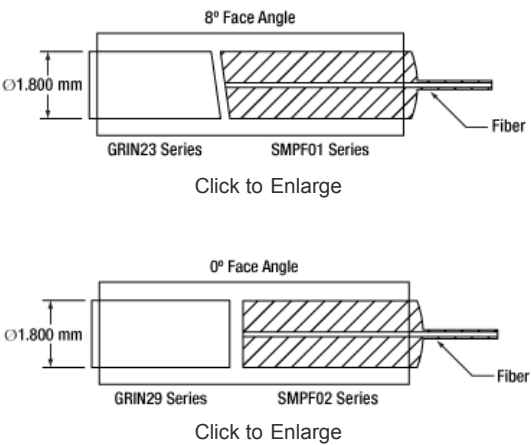
Our line of pigtailed glass ferrules is designed to simplify coupling of visible, near infrared, or infrared light between a fiber and a free-space optical system. They are commonly used in optical isolators, switches, and circulators. The Ø1.8 mm ferrule is significantly easier to handle than an unterminated fiber end. The 1 m long, single mode fiber embedded in the ferrule is protected by Ø900 µm white Hytrel furcation tubing and terminated with a narrow key FC/PC or FC/APC connector. See the *Specs* tab for the available fiber types and a representative schematic.

Common Specifications	
Ferrule Diameter	1.800 mm ± 5 µm
Ferrule Length	5.5 mm ± 0.5 mm
Ferrule Material	Borosilicate Glass
Wedge Tolerance	±1.00°
Fiber Length	1.0 m +0.075 m/-0.0 m
Protective Jacket	Ø900 µm Hytrel Tubing



These ferrules feature an AR coating centered at 633, 830, 1064, 1310, and 1550 nm or 1310/1550 nm. The coating lowers the reflectivity in the specified wavelength range to below 0.25%, reducing back reflections and insertion losses in the design wavelength range. In addition, all five coatings are available with either 8° or 0° face angles. The 8° versions maximize the return loss by back reflecting the incident light at a non-normal angle and are recommended for building collimators. In contrast, the 0° versions are easier to align but are only recommended for general fiber-to-fiber coupling. Our line of GRIN lenses provides an 8° or 0° face angle that is designed to match the pigtailed ferrules.



Thorlabs also offers a complete selection of mating sleeves that ensure proper alignment of the cores of a connectorized fiber end. If you do not see a pigtailed patch cable that meets your application requirements, please contact Tech Support and we will design a specialty cable to meet your needs.



All GRIN Lens / Pigtailed Ferrule combinations require a 51-2800-1800 mating sleeve, shown below. To build the device, insert the lens and ferrule into opposing sides of the sleeve, gently bring them into contact to ensure that the faces are parallel, then bring the lens and ferrule apart until the desired focusing is achieved.

Selection Guide					
Wavelength	Face Angle	Compatible GRIN Lenses	Pigtailed Ferrule		
633 ± 15 nm	8°	GRIN2306A	No Connector	FC/PC	FC/APC
	0°	GRIN2906	No Connector	FC/PC	FC/APC
830 ± 15 nm	8°	GRIN2308A	No Connector	FC/PC	FC/APC
	0°	GRIN2908	No Connector	FC/PC	FC/APC
1064 ± 15 nm	8°	GRIN2310A	No Connector	FC/PC	FC/APC
	0°	GRIN2910	No Connector	FC/PC	FC/APC
1310 ± 15 nm	8°	GRIN2313A	No Connector	FC/PC	FC/APC
	0°	GRIN2913	No Connector	FC/PC	FC/APC
1550 ± 15 nm	8°	GRIN2315A	No Connector	FC/PC	-
	0°	GRIN2915	No Connector	-	FC/APC
1310/1550 ± 40 nm	8°	GRIN2313A GRIN2315A	-	-	FC/APC
	0°	GRIN2913 GRIN2915	-	FC/PC	-


Pigtailed Ferrules with FC/PC Connectors

Item #	Connector	Face Angle	AR Coating Range	Reflectance Over AR Coating Range	NA	Operating Wavelength	Cutoff Wavelength	Fiber Type	Compatible GRIN Lens ^a	Reference Diagram
SMPF0106-FC	FC/PC	8°	633 ± 15 nm	R _{avg} < 0.25%	0.12	600 - 800 nm	500 - 600 nm	SM600	GRIN2306A	
SMPF0108-FC			830 ± 15 nm	R _{avg} < 0.25%	0.12	800 - 1000 nm	660 - 800 nm	SM800-5.6-125	GRIN2308A	
SMPF0110-FC			1064 ± 15 nm	R _{avg} < 0.25%	0.14	980 - 1060 nm	920 ± 50 nm	HI1060-J9	GRIN2310A	
SMPF0113-FC			1310 ± 15 nm	R _{avg} < 0.25%	0.14	1260 - 1620 nm	<1260 nm	SMF-28e+	GRIN2313A	
SMPF0115-FC			1550 ± 15 nm	R _{avg} < 0.25%	0.14	1260 - 1620 nm	<1260 nm	SMF-28e+	GRIN2315A	
SMPF0206-FC		0°	633 ± 15 nm	R _{avg} < 0.25%	0.12	600 - 800 nm	500 - 600 nm	SM600	GRIN2906	
SMPF0208-FC			830 ± 15 nm	R _{avg} < 0.25%	0.12	800 - 1000 nm	660 - 800 nm	SM800-5.6-125	GRIN2908	
SMPF0210-FC			1064 ± 15 nm	R _{avg} < 0.25%	0.14	980 - 1060 nm	920 ± 50 nm	HI1060-J9	GRIN2910	
SMPF0213-FC			1310 ± 15 nm	R _{avg} < 0.25%	0.14	1260 - 1620 nm	<1260 nm	SMF-28e+	GRIN2913	
SMPF0215-FC			1310/1550 ± 40 nm	R _{max} < 0.25%	0.14	1260 - 1620 nm	<1260 nm	SMF-28e+	GRIN2913 GRIN2915	

- GRIN lenses are sold separately.

Part Number	Description	Price	Availability
SMPF0106-FC	Pigtailed Ferrule, Ø1.8 mm, 8°, FC/PC, AR Coated: 633 nm	\$63.25	Today
SMPF0108-FC	Pigtailed Ferrule, Ø1.8 mm, 8°, FC/PC, AR Coated: 830 nm	\$71.50	Today
SMPF0110-FC	Pigtailed Ferrule, Ø1.8 mm, 8°, FC/PC, AR Coated: 1064 nm	\$71.50	Today
SMPF0113-FC	Pigtailed Ferrule, Ø1.8 mm, 8°, FC/PC, AR Coated: 1310 nm	\$53.50	3-5 Days
SMPF0115-FC	Pigtailed Ferrule, Ø1.8 mm, 8°, FC/PC, AR Coated: 1550 nm	\$53.00	Today
SMPF0206-FC	Pigtailed Ferrule, Ø1.8 mm, 0°, FC/PC, AR Coated: 633 nm	\$71.50	Today
SMPF0208-FC	Pigtailed Ferrule, Ø1.8 mm, 0°, FC/PC, AR Coated: 830 nm	\$71.50	Today
SMPF0210-FC	Pigtailed Ferrule, Ø1.8 mm, 0°, FC/PC, AR Coated: 1064 nm	\$66.00	Today
SMPF0213-FC	Pigtailed Ferrule, Ø1.8 mm, 0°, FC/PC, AR Coated: 1310 nm	\$53.00	3-5 Days
SMPF0215-FC	Pigtailed Ferrule, Ø1.8 mm, 0°, FC/PC, AR Coated: 1310/1550 nm	\$53.00	Today

Pigtailed Ferrules with FC/APC Connectors

Item #	Connector	Face Angle	AR Coating Range	Reflectance Over AR Coating Range	NA	Operating Wavelength	Cutoff Wavelength	Fiber Type	Compatible GRIN Lens ^a	Reference Diagram
SMPF0106-APC	FC/APC	8°	633 ± 15 nm	R _{avg} < 0.25%	0.12	600 - 800 nm	500 - 600 nm	SM600	GRIN2306A	
SMPF0108-APC			830 ± 15 nm	R _{avg} < 0.25%	0.12	800 - 1000 nm	660 - 800 nm	SM800-5.6-125	GRIN2308A	
SMPF0110-APC			1064 ± 15 nm	R _{avg} < 0.25%	0.14	980 - 1060 nm	920 ± 50 nm	HI1060-J9	GRIN2310A	
SMPF0113-APC			1310 ± 15 nm	R _{avg} < 0.25%	0.14	1260 - 1620 nm	<1260 nm	SMF-28e+	GRIN2313A	
SMPF0115-APC			1310/1550 ± 40 nm	R _{max} < 0.25%	0.14	1260 - 1620 nm	<1260 nm	SMF-28e+	GRIN2313A GRIN2315A	
SMPF0206-APC			633 ± 15 nm	R _{avg} < 0.25%	0.12	600 - 800 nm	500 - 600 nm	SM600	GRIN2906	
SMPF0208-							660 - 800	SM800-5.6-		

APC	0°	830 ± 15 nm	$R_{avg} < 0.25\%$	0.12	800 - 1000 nm	nm	125	GRIN2908	
SMPF0210-APC		1064 ± 15 nm	$R_{avg} < 0.25\%$	0.14	980 - 1060 nm	920 ± 50 nm	HI1060-J9	GRIN2910	
SMPF0213-APC		1310 ± 15 nm	$R_{avg} < 0.25\%$	0.14	1260 - 1620 nm	<1260 nm	SMF-28e+	GRIN2913	
SMPF0215-APC		1550 ± 15 nm	$R_{avg} < 0.25\%$	0.14	1260 - 1620 nm	<1260 nm	SMF-28e+	GRIN2915	

- GRIN lenses are sold separately.

Part Number	Description	Price	Availability
SMPF0106-APC	Pigtailed Ferrule, Ø1.8 mm, 8°, FC/APC, AR Coated: 633 nm	\$73.50	Today
SMPF0108-APC	Pigtailed Ferrule, Ø1.8 mm, 8°, FC/APC, AR Coated: 830 nm	\$81.50	Today
SMPF0110-APC	Pigtailed Ferrule, Ø1.8 mm, 8°, FC/APC, AR Coated: 1064 nm	\$81.50	Today
SMPF0113-APC	Pigtailed Ferrule, Ø1.8 mm, 8°, FC/APC, AR Coated: 1310 nm	\$63.50	3-5 Days
SMPF0115-APC	Pigtailed Ferrule, Ø1.8 mm, 8°, FC/APC, AR Coated: 1310/1550 nm	\$63.25	Today
SMPF0206-APC	Pigtailed Ferrule, Ø1.8 mm, 0°, FC/APC, AR Coated: 633 nm	\$81.50	Today
SMPF0208-APC	Pigtailed Ferrule, Ø1.8 mm, 0°, FC/APC, AR Coated: 830 nm	\$81.50	Today
SMPF0210-APC	Pigtailed Ferrule, Ø1.8 mm, 0°, FC/APC, AR Coated: 1064 nm	\$76.25	Today
SMPF0213-APC	Pigtailed Ferrule, Ø1.8 mm, 0°, FC/APC, AR Coated: 1310 nm	\$63.25	3-5 Days
SMPF0215-APC	Pigtailed Ferrule, Ø1.8 mm, 0°, FC/APC, AR Coated: 1550 nm	\$63.25	Today

GRIN Lens / Ferrule Sleeves

- Borosilicate Glass
- 10.0 mm Length
- 1.818 mm Internal Diameter



The 51-2800-1800 sleeve is designed to easily mate any one of our GRIN lenses to an SMPF pigtailed ferrule. The borosilicate glass is transparent to UV light, allowing curing of NOA68 or NOA61 optical adhesive inside the sleeve. See [here](#) for our complete selection of optical adhesives.

Part Number	Description	Price	Availability
51-2800-1800	GRIN/Ferrule Sleeve, 1.818 mm Internal Diameter, 10 mm Length, Borosilicate Glass	\$6.05	Today