OZ OPTICS LIMITED
ozOptics
www.ozoptics.com
219 Westbrook Rd, Ottawa, ON, Canada, K0A 1L0 Toll Free: 1-800-361-5415 Tel:(613) 831-0981 Fax:(613) 836-5089 E-mail: sales@ozoptics.com

STANDARD TABLES

The following pages list the standard fibers, cables, connectors, lenses, and laser head adaptors available from OZ Optics. Accompanying each table are technical notes to help you make the most informed decision possible. Use these tables to pick the best components for your application. Non-standard components can be made available at the customer's request. Contact OZ Optics for more information.

Table 1: Standard Singlemode Fibers

Bar Code	Part Number	Operating Wavelength Range[1] (nm)	Cutoff Wavelength (nm)[2]	Core Diameter (µm)	Cladding Diameter (µm)	Mode Field Diameter (µm)	Attenuation (dB/km)	Numerical Aperture (Manufacturer's Specs)[3]	Effective Numerical Aperture (1/e2)[3]	Jacket or Buffer Diameter (mm)[4]
1197	QSMF-320-2/125-0.25-L[5]	320-400	<300	2 ± 1	125 ± 3	2.2 (Typical)	200 @ 340 to 360 nm	0.12 ± 0.03	0.093 @ 320 nm	0.25
14579	QSMF-400-3/125-0.25-L[5]	400-450	<380	2.5/3.0	125 ± 2	4.0 (Typical)	<60 @ 400 nm	0.10 ± 0.01	0.065 @ 400 nm	0.25
1202	QSMF-488-3.5/125-0.25-L[5]	450-650	<440	3.5 ± 0.5	125+3/-1	4.2 (Typical)	<30 @ 488 nm	0.11 ± 0.015	0.074 @ 488 nm	0.25
1204	QSMF-488-3.5/125-3-L[5]	458-650	<440	3.5 ± 0.5	125 +3/-1	4.2 (Typical)	<30 @ 488 nm	0.11	0.074 @ 488 nm	3.0
17333	SMF-633-4/125-0.25-NF-L	600-850	<600	4	125 ± 2	4.0 ± 0.5	<12	0.13	0.10 @ 633 nm	0.25
10106	SMF-633-4/125-1-L	630-850	<620	4.0	125 ± 2	4.0 ± 0.5	<12	0.12	0.10 @ 633 nm	0.9
10108	SMF-633-4/125-3-L	630-850	<620	4.0	125 ± 2	4.0 ± 0.5	<12	0.12	0.10 @ 633 nm	3.0
1215	SMF-780-5/125-0.25-L	780-980	<770	4.9	125 ± 1	5.4 ± 1.0	<4	0.11	0.092 @ 780 nm	0.25
1217	SMF-780-5/125-3-L	780-980	<770	4.9	125 ± 1	5.4 ± 1.0	<4	0.11	0.092 @ 780 nm	3.0
1224	SMF-1060-6/125-0.25-L	980-1550	<970	6.0	125 ± 0.5	5.9 ± 0.3 @ 980 nm 6.2± 0.3 @ 1060 nm	2.1 @ 980 nm 1.5 @ 1060 nm	0.14	0.11 @ 1060 nm	0.25
1230	SMF-1300-9/125-0.25-L[6]	1290-1650	<1260	8.2	125 ± 0.7	9.2 ± 0.4 @ 1310 nm 10.4 ± 0.8 @ 1550 nm	<0.22 @ 1310 nm <0.35 @ 1550 nm	0.14	0.090 @ 1300 nm 0.095 @ 1550 nm	0.25
1232	SMF-1300-9/125-1-L[6]	1290-1650	<1260	8.2	125 ± 0.7	9.2 ± 0.4 @ 1310 nm 10.4 ± 0.8 @ 1550 nm	<0.22 @ 1310 nm <0.35 @ 1550 nm	0.14	0.090 @ 1300 nm 0.095 @ 1550 nm	0.9
11788	SMF-1300-9/125-2-L[6]	1290-1650	<1260	8.2	125 ± 0.7	9.2 ± 0.4 @ 1310 nm 10.4 ± 0.8 @ 1550 nm	<0.22 @ 1310 nm <0.35 @ 1550 nm	0.14	0.090 @ 1300 nm 0.095 @ 1550 nm	2.0
2749	SMF-1300-9/125-3-L[6]	1290-1650	<1260	8.2	125 ± 0.7	9.2 ± 0.4 @ 1310 nm 10.4 ± 0.8 @ 1550 nm	<0.22 @ 1310 nm <0.35 @ 1550 nm	0.14	0.090 @ 1300 nm 0.095 @ 1550 nm	3.0

Notes:

1. While the fibers will work over the entire operating range listed, it is recommended that one selects the fiber with the longest wavelength specifications that still operates at your wavelength of interest. For instance, for 780 nm work we recommend selecting SMF-780-5/125 fiber over SMF-633-4/125 fiber.
2. If the fiber is used at wavelengths less than the cutoff wavelength, the fiber will still transmit light. However it will begin to behave like a multimode fiber. This is not desired in most applications.
3. Most fiber manufacturers define the numerical aperture of their fibers based on the refractive indices of the core and cladding (i.e., $NA = [N_{CO}^2 - N_{CL}2]^{1/2}$). While this definition is useful for step index multimode fibers, it is not a very accurate way to predict the far field behavior of light from singlemode fibers.

   A more accurate technique is to use the Mode Field Diameter (MFD) for the light within the fiber to determine the far field. We can treat the output from the fibers as being essentially Gaussian in behavior. If we then define the effective numerical aperture (NA_{eff}) of the fiber as being the sine of the angle from the center to where the intensity drops to $1/e^2$ of the original value then one can show that $NA_{eff} = 2\lambda/\pi MFD$. We have listed NA_{eff} for each fiber at typical values for the mode field diameter and wavelength in the table.
4. The jacket diameters listed are for those fibers that come from the manufacturer pre-cabled. For short lengths of fibers OZ Optics can cable the fibers in a loose tube cable. For instance, SMF-780-5/125-0.25-L fiber, which has a 0.25 mm coating diameter, can be cabled with a 0.9 mm diameter loose tubing to provide extra protection.
5. These fibers feature pure fused silica fiber cores for improved optical power handling.
6. Corning SMF-28 fiber is used for both 1300 nm and 1550 nm singlemode applications unless otherwise specified.

Table 1B: Large Mode Area Fibers

Bar Code	Part Number	Operating Wavelength (nm)	Core Diameter (µm)	Cladding Diameter (µm)	Attenuation (dB/km)	Numerical Aperture	Buffer Diameter (mm)	Buffer Material
36269	SMF-1060-20/125-0.25-L-LMA	1064	20	125	<10dB/km	0.10	0.25	Acrylate
35688	SMF-1060-25/125-0.25-L-LMA	1064	25	125	<10dB/km	0.10	0.25	Acrylate
34564	SMF-1064-20/130-0.25-L-SP	1064	20	130	<10dB/km	0.08	0.25	Acrylate
35689	SMF-1060-25/250-0.4-L-LMA	1064	25	250	<10dB/km	0.06	0.40	Acrylate

Table 2: Standard Polarization Maintaining Fibers[1]

Bar Code	Part Number	Operating Wavelength Range[2] (nm)	Cutoff Wave-length (nm)[3]	Core Diameter (µm)	Cladding Diameter (µm)	Mode Field Diameter (µm)	Attenuation (dB/km)	Numerical Aperture (Manufact-urer's Specs)[4]	Effective Numerical Aperture (1/e2)[4]	Jacket or Buffer Diameter (mm)[5]	Jacket Material	Polarization Crosstalk (dB/100m)
27626	QPMF-350-2/125-0.25-L	350-440	<340	2	125	2.3@350 nm 2.6@405 nm	<200	0.12	0.097	0.25	Dual Acrylate	<-20
29228	QPMF-400-3/125-0.25-L[6]	405-480	<400	3.0	125	3.1 (Typical)	<100	0.11	0.082 @ 400 nm	0.9	Dual Acrylate	<-20
1170	QPMF-488-3.5/125-1-L[6]	480-630	<470	3.5	125	3.8 (Typical)	<50	0.11	0.082 @ 488 nm	0.9	Acrylate / Nylon	<-25
1172	PMF-633-4/125-0.25-L	630-820	<620	4	125	4.5 (Typical)	<12	0.11	0.089 @ 633 nm	0.25	Dual Acrylate	<-25
1174	PMF-633-4/125-1-L	630-820	<620	4	125	4.5 (Typical)	<12	0.11	0.089 @ 633 nm	0.9	Acrylate / Nylon	<-25
1181	PMF-850-5/125-0.4-L	810-980	<800	5	125	5.5 ± 1	<3	0.11	0.098 @ 850 nm	0.40	Dual Acrylate	<-25
2813	PMF-850-5/125-0.25-L	810-980	<800	5	125	5.5 ± 1	<3	0.11	0.098 @ 850 nm	0.25	Dual Acrylate	<-25
3382	PMF-980-6/125-0.4-L	980-1300	<970	6	125	6.6 ± 1	<3	0.11	0.095 @ 980 nm	0.40	Dual Acrylate	<-25
8574	PMF-980-6/125-0.25-L	980-1300	<970	6	125	6.6 ± 1	<3	0.11	0.095 @ 980 nm	0.25	Dual Acrylate	<-25
4570	PMF-1300-7/125-0.25-L	1290-1550	<1280	7	125	9.5 ± 1	<1.0	0.11	0.088 @ 1310 nm	0.25	Dual Acrylate	<-25
1194	PMF-1550-8/125-0.4-L	1460-1625	<1450	8.7	125	10.5 ± 1	<0.5	0.11	0.094 @ 1550 nm	0.40	Dual Acrylate	<-25
4550	PMF-1550-8/125-0.25-L	1460-1625	<1450	8.7	125	10.5 ± 1	<0.5	0.11	0.094 @ 1550 nm	0.25	Dual Acrylate	<-25

Notes:

1 All standard polarization maintaining (PM) fibers are based on the PANDA PM fiber structure. Other types are available on request.

2 While the fibers will work over the entire operating range listed, it is recommended that one selects the fiber with the longest wavelength specifications that still operates at your wavelength of interest. For instance, for 820 nm work we recommend selecting PMF-850-5/125 fiber over PMF-633-4/125 fiber.

3 If the fiber is used at wavelengths less than the cutoff wavelength, the fiber will still transmit light. However it will begin to behave like a multimode fiber. It will no longer work like a polarization maintaining fiber.

4 Most fiber manufacturers define the numerical aperture of their fibers based on the refractive indices of the core and cladding (i.e., $NA = [N_{CO}^2 - N_{CL}^2]^{1/2}$). While this definition is useful for step index multimode fibers, for singlemode fibers, it is not a very accurate way to predict the far field behavior of light from the fiber. A more accurate technique is to use the Mode Field Diameter (MFD) for the light within the fiber to determine the far field. We can treat the output from the fibers as being essentially Gaussian in behavior. If we then define the effective numerical aperture (NA_{eff}) of the fiber as being the sine of the angle from the center to where the intensity drops to $1/e^2$ of the original value then one can show that $NA_{eff} = 2\lambda/\pi MFD$. We have listed NA_{eff} for each fiber at typical values for the mode field diameter and wavelength in the table.

5 The jacket diameters listed are for those fiber that come from the manufacturer pre-cabled. For short lengths of fibers OZ Optics can cable the fibers in a loose tube cable. For instance, PMF-1550-8/125-0.4-L fiber, which has a 0.4 mm coating diameter, can be cabled with a 0.9 mm diameter loose tubing to provide extra protection.

6 These fibers feature pure fused silica fiber cores for improved optical power handling.

Table 3: Standard Graded Index Multimode Fibers[1]

Bar Code	Part Number	Operating Wavelength Range (nm)	Core Diameter (µm)	Cladding Diameter (µm)	Attenuation (dB/km)	Numerical Aperture[2]	Jacket or Buffer Diameter (mm)
16149	MMF-IRVIS-50/125-0.25-L	400 - 1800	50 ± 3	125 ± 2	≤2.5 dB @ 850 nm ≤0.8 dB @ 1300 nm	0.200 ± 0.015	0.25
1235	MMF-IRVIS-50/125-1-L	400 - 1800	50 ± 3	125 ± 2	≤2.5 dB @ 850 nm ≤0.8 dB @ 1300 nm	0.200 ± 0.015	0.9
1236	MMF-IRVIS-50/125-3-L	400 - 1800	50 ± 3	125 ± 2	≤2.5 dB @ 850 nm ≤0.8 dB @ 1300 nm	0.200 ± 0.015	3.0
3715	MMF-IRVIS-62.5/125-0.25-L	400 - 1800	62.5 ± 3	125 ± 2	≤3.0 dB @ 850 nm ≤0.7 @ 1300 nm	0.275 ± 0.015	0.25
1237	MMF-IRVIS-62.5/125-1-L	400 - 1800	62.5 ± 3	125 ± 2	≤3.0 dB @ 850 nm ≤0.7 @ 1300 nm	0.275 ± 0.015	0.9
1238	MMF-IRVIS-62.5/125-3-L	400 - 1800	62.5 ± 3	125 ± 2	≤3.0 dB @ 850 nm ≤0.7 @ 1300 nm	0.275 ± 0.015	3.0
1240	MMF-IRVIS-100/140-1-L	400 - 1800	100 ± 3	140 ± 4	≤6.0 dB @ 850 nm ≤3.0 dB @ 1300 nm	0.29 ± 0.02	0.9
1241	MMF-IRVIS-100/140-3-L	400 - 1800	100 ± 3	140 ± 4	≤6.0 dB @ 850 nm ≤3.0 dB @ 1300 nm	0.29 ± 0.02	3.0

Notes:

1 Corning graded index fibers used for 50/125, 62.5/125, and 100/140 fiber sizes.

2 According to Corning's definition of the numerical aperture for graded index multimode fibers (EIA/TIA-455-177A), when all modes are uniformly excited in graded index multimode fiber, then the intensity of the output light is 5% of the center intensity at the angle whose sine equals the numerical aperture. This is the definition used for our coupler, collimator, and focuser calculations when using these fibers. Assuming that the overall intensity pattern (i.e., ignoring modal noise) is Gaussian in behavior, we can calculate the Gaussian beam size as 81.7% the size calculated from the numerical aperture.

Table 4: Standard Step Index Multimode Fibers For Visible And Ultraviolet Wavelengths

Bar Code	Part Number	Wavelength Range (nm)	Core Diameter (µm)	Cladding Diameter (µm)	Other Coatings (µm)	Attenuation (dB/km)[1]	Numerical Aperture	Jacket or Buffer Diameter (mm)	Cladding Material
1247	QMMF-UVVIS-10/125-0.25-L	180 - 900	10 ± 2	125 ± 3	N/A	<100 @380-870 nm	0.10	0.25	Fused Silica
1251	QMMF-UVVIS-25/125-0.25-L	180 - 900	25 ± 4	125 +3/-0	N/A	<100 @380-870 nm	0.13	0.25	Fused Silica
1259	QMMF-UVVIS-50/125-0.25-L	200 - 900	50 ± 1	125 ± 3	N/A	<100 @300-900 nm <1000 @220-300 nm	0.22	0.25	Fused Silica
1253	QMMF-UVVIS-50/125-0.25-L-NA=0.12	200 - 900	50 ± 1	125 ± 3	N/A	<100 @300-900 nm <1000 @220-300 nm	0.12	0.25	Fused Silica
1474	QMMF-UVVIS-50/125-1-L	200 - 900	50 ± 1	125 ± 3	N/A	<100 @320-900 nm <1000 @220-320 nm	0.22	0.9	Fused Silica
1257	QMMF-UVVIS-50/125-3-L	200 - 900	50 ± 1	125 ± 3	N/A	<100 @300-900 nm <1000 @220-300 nm	0.22	3.0	Fused Silica
1271	QMMF-UVVIS-100/140-0.25-L	200 - 900	100 ± 2	140 ± 3	N/A	<100 @300-900 nm <1000 @220-300 nm	0.22	0.25	Fused Silica
1287	QMMF-UVVIS-200/240-0.4-L	200 - 900	200 ± 5	240 ± 5	Hard Coat 260 ± 5	<100 @380-900 nm <1000 @250-380 nm	0.22	0.375	Fused Silica
27638	QMMJ-UVVIS-300/330-0.53-L	200-900	300 ± 6	330 ± 7	Buffer 430 ± 13	<100 @ 300-900 nm <1000 @ 220-300nm	0.22	0.53	Fused Silica
1294	QMMF-UVVIS-365/400-0.73-L	200 - 900	365 ± 10	400 ± 10	Hard Coat 425 ± 10	<100 @380-900 nm <1000 @250-380 nm	0.22	0.73	Fused Silica
27639	QMMJ-UVVIS-400/440-0.64-L	200-900	400 ± 8	440 ± 9	Buffer 540 ± 16	<100 @ 300-900 nm <1000 @ 220-300nm	0.22	0.64	Fused Silica
1793	QMMF-UVVIS-550/600-0.75-L	200-900	550 ± 12	600 ± 10	Hard Coat 630 ± 10	<100 @380-900 nm <1000 @250-380 nm	0.22	0.75	Fused Silica
2838	QMMF-UVVIS-600/660-1.2-L	200-900	600 ± 12	660 ± 13	Buffer 810 ± 25	<100 @300-900 nm <1000 @220-300 nm	0.22	1.2	Fused Silica
27640	QMMJ-UVVIS-800/880-1-L	200-900	800 ± 16	880 ± 18	Buffer 980 ± 30	<100 @ 300-900 nm <1000 @ 220-300nm	0.22	1.08	Fused Silica
1302	QMMF-UVVIS-940/1000-1.4-L	200-900	940 ± 15	1000 ± 15	Hard Coat 630 ± 10	<100 @380-900 nm <1000 @250-380 nm	0.22	1.4	Fused Silica

Notes:

1 The attenuation of these fibers is highly wavelength dependent. For detailed attenuation versus wavelength data contact OZ Optics.

2 For maximum power handling, the input light must be focused such that the focused spot size is about 70% of the fiber core size, while the NA of the focused rays should be between 30% and 90% of the NA of the fiber. We strongly recommend using high power, air gap design connectors for very high power coupling applications.

3 Power handling for pulsed laser light is dependent on the pulse energy, duration, and wavelength. Contact OZ for power handling for pulsed laser applications.

4 While OZ Optics believes this information to be reliable, it is only provided as a general guide, and can be greatly affected by individual circumstances. OZ Optics offers no warranties as to its accuracy, and disclaims any liability in connection to its use.

Table 5: Standard Step Index Multimode Fibers For Infrared And Visible Wavelengths

Bar Code	Part Number	Wavelength Range (nm)	Core Diameter (µm)	Cladding Diameter (µm)	Other Coatings (µm)	Attenuation (dB/km)[1]	Numerical Aperture	Jacket or Buffer Diameter (mm)	Cladding Material
13460	QMMF-IRVIS-50/125-0.3-L	350-2400	50 ± 2	125 ± 3	N/A	20dB peak @1390 nm <10 @630 - 1800 nm	0.22	0.3	Fused Silica
1260	QMMF-IRVIS-50/125-1-L	500 - 2100	50 ± 3	125 ± 3	N/A	<10 @ 600 - 1200 nm <100 @ 500 - 2100 nm	0.2	0.9	Fused Silica
1263	QMMF-IRVIS-50/125-3-L	350 - 2100	50 ± 2	125 ± 3	N/A	20dB peak @1390 nm <10 @ 630 - 1800 nm	0.22	3.0	Fused Silica
1268	QMMF-IRVIS-100/140-0.25-L	350 - 2100	100 ± 2	140 ± 3	N/A	20dB peak @1390 nm <10 @630 - 1800 nm	0.22	0.25	Fused Silica
1282	QMMF-IRVIS-200/230-0.5-L	500 - 1500	200 ± 4	230 +0/-10	N/A	≤20 @ 530 - 1100 nm 29 @ 1300 nm	0.37	0.50	Polymer
1283	QMMF-IRVIS-200/230-3-L	500 - 1500	200 ± 4	230 +0/-10	N/A	≤20 @ 530 - 1100 nm 29 @ 1300 nm	0.37	3.0	Polymer
1288	QMMF-IRVIS-200/240-0.4-L	400 - 2100	200 ± 5	240 ± 5	Hard Coat 260 ± 5	<10 @630 - 1900 nm	0.22	0.4	Fused Silica
1289	QMMF-IRVIS-200/240-3-L	400 - 2100	200 ± 5	240 ± 5	Hard Coat 260 ± 5	<10 @630 - 1900 nm	0.22	3.0	Fused Silica
2512	QMMF-IRVIS-300/330-0.65-L	500 - 1500	300 ± 6	330 +5/-10	N/A	≤20 @ 530 - 1100 nm 29 @ 1300 nm	0.37	0.65	Polymer
3297	QMMF-IRVIS-365/400-0.73-L	400 - 2100	365 ± 14	400 ± 8	Hard Coat 425 ± 10	20dB peak @1390 nm <10 @630 - 1800 nm	0.22	0.73	Fused Silica
1809	QMMF-IRVIS-400/430-0.73-L	500 - 1500	400 ± 8	430 +5/-10	N/A	≤20 @ 530 - 1100 nm 29 @ 1300 nm	0.37	0.73	Polymer
2739	QMMF-IRVIS-400/440-0.6-L	350 - 2100	400 ± 8	440 ± 9	Buffer 540 ± 17	20dB peak @1390 nm <10 @630 - 1800 nm	0.22	0.64	Fused Silica
1298	QMMF-IRVIS-550/600-0.75-L	400 - 2100	550 ± 12	600 ± 10	Hard Coat 630 ± 10	<10 @630 - 1900 nm	0.22	0.75	Fused Silica
1299	QMMF-IRVIS-600/630-1-L	500 - 1500	600 ± 10	630 +5/-10	N/A	≤20 @ 530 - 1100 nm 29 @ 1300 nm	0.37	1.04	Polymer
1300	QMMF-IRVIS-600/630-3-L	500 - 1500	600 ± 10	630 +5/-10	N/A	≤20 @ 530 - 1100 nm 29 @ 1300 nm	0.37	3.0	Polymer
1790	QMMF-IRVIS-940/1000-1.4-L	400 - 2100	940 ± 15	1000 ± 15	Hard Coat 1035 ± 15	<10 @630 - 1900 nm	0.22	1.40	Fused Silica
1303	QMMF-IRVIS-1000/1035-1.4-L	500 - 1500	1000 ± 15	1035 ± 15	N/A	≤20 @ 530 - 1100 nm 29 @ 1300 nm	0.37	1.40	Polymer

Notes:

[1] The attenuation of these fibers is wavelength dependent. For detailed attenuation versus wavelength data contact OZ Optics.

[2] For maximum power handling, the input light must be focused such that the focused spot size is about 70% of the fiber core size, while the NA of the focused rays should be between 30% and 90% of the NA of the fiber. We strongly recommend using high power, air gap design connectors for very high power coupling applications.

[3] Power handling for pulsed laser light is dependent on the pulse energy, duration, and wavelength. Contact OZ for power handling for pulsed laser applications.

[4] While OZ Optics believes this information to be reliable, it is only provided as a general guide, and can be greatly affected by individual circumstances. OZ Optics offers no warranties as to its accuracy, and disclaims any liability in connection to its use.

Table 6A: Standard Connectors And Connector Finishes*

Connector Code	Connector Type[1]	Endface Polish[2]	Return Loss (Free Space)[3]	Return Loss (Connected)[4]	Comments
1	1.8 mm diameter ferrule	Flat	-14 dB	N/A[5]	Used for pigtailing only.
1A	1.8 mm diameter ferrule	8 Degree Angled	-65 dB	N/A[5]	Used for pigtailing only.
1.25	1.25 mm diameter ferrule	Flat	-14 dB	N/A[5]	Used for pigtailing only.
1.25A	1.25 mm diameter ferrule	8 Degree Angled	-65 dB	N/A[5]	Used for pigtailing only.
1.4	1.4 mm diameter ferrule	Flat	-14 dB	N/A[5]	Used for pigtailing only.
1.4A	1.4 mm diameter ferrule	8 Degree Angled	-65 dB	N/A[5]	Used for pigtailing only.
2F	2 mm diameter ferrule	Flat	-14 dB	N/A[5]	Used for pigtailing only.
2A	2 mm diameter ferrule	8 Degree Angled	-65 dB	N/A[5]	Used for pigtailing only.
2.5	2.5 mm diameter ferrule	Flat	-14 dB	N/A[5]	Used for pigtailing only.
2.5A	2.5 mm diameter ferrule	8 Degree Angled	-65 dB	N/A[5]	Used for pigtailing only.
3	NTT-FC	Flat	-14 dB	<-11 dB	Use for multimode fibers.
3S	NTT-FC	Super PC	-14 dB	<-40 dB	Standard single mode and polarization maintaining fiber connector. Highly recommended.
3U	NTT-FC	Ultra PC	-14 dB	<-50 dB	Lower return loss version of the 3S connector. Also highly recommended for telecom.
3A	NTT-FC	8 Degree Angled PC (APC)	-65 dB	<-60 dB	Lowest return loss FC connector design.
3AF	NTT-FC	8 Degree Angled PC (APC)	-65 dB	NA[6]	Special Angled flat version of the FC design to give low return loss, excellent repeatability for free space couplers and collimators.
A3	Adjustable NTT-FC	Flat	-14 dB	NA[6]	For couplers and collimators designs with adjustable focus.
A3A	Adjustable NTT-FC	8 Degree Angled PC (APC)	-65 dB	NA[6]	Low return loss version of the A3 connector.
5	SMA 905	Flat	-14 dB	<-11 dB	Recommended for large core multimode fibers.
5HP	SMA 905	Flat, Air Gap	-14 dB	<-11 dB	Special version of the SMA-905 connector, with the tip of the fiber epoxy free to avoid out-gassing.
6	SMA 906	Flat	-14 dB	<-11 dB	Lower losses than SMA-905 when connecting 2 fibers. Not often used.
8	AT&T-ST	Super PC	-14 dB	<-40 dB	Common in multimode and singlemode telecom systems.
SC	SC	Super PC	-14 dB	<-40 dB	Increasingly used in telecom.
SCU	SC	Ultra PC	-14 dB	<-50 dB	Lower return loss version of the SC.
SCA	SC	8 Degree Angled PC (APC)	-65 dB	<-60 dB	Lowest return loss SC connector design.
LC	LC	Super PC	-14 dB	<-40 dB	Small form factor connector, to increase connection density.
LCU	LC	Ultra PC	-14 dB	<-50 dB	Lower return loss version of the LC.
LCA	LC	8 Degree Angled PC (APC)	-65 dB	<-60 dB	Low return loss version of the LC.
MU	MU	Super PC	-14 dB	<-40 dB	Alternative to the LC design. Used more outside North America.
E	E2000	Super PC	-14 dB	<-40 dB	Increasingly popular in Europe. Has built in safety shutter.
EA	E2000	8 Degree Angled PC (APC)	-65 dB	<-60 dB	Low return loss version of E2000 connector.
MD	Mini DMI	Super PC	-14 dB	<-40 dB	Miniature connector for dense connector packaging.
MDA	Mini DMI	8 Degree Angled PC (APC)	-65 dB	<-60 dB	Low return loss version of DMI connector.
M8	Mini ST	Super PC	-14 dB	<-40 dB	Miniature connector. Features spring loading, self-contained connector.
X	No Connector	No finish	N/A	N/A	

Notes:

1 Connector type refers to the most common industry name for the connector.

2 See Table 6B for a detailed description of the different connector finishes

3 Refers to the return loss seen reflected from the connector as light travels out of the fiber and into air.

4 Refers to the return loss seen when two identical connectors are mated using a sleeve thru connector.

5 These codes are for ferrules only, and are not designed to mate together in a connector.

6 These connectors are intended for use in free space applications only, such as collimators or focuser assemblies, not to be mated in a connector.

* Special connectors for high power patchcords are also available. See the “High Power/Temperature Patch and Connectors” data sheet for details.

Table 6B: Description Of Connector Finishes

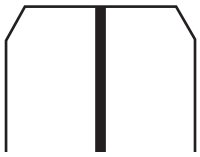
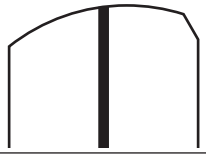
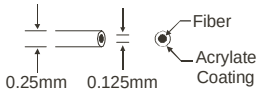
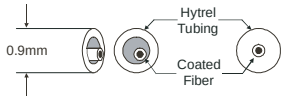
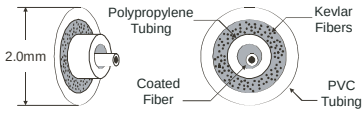
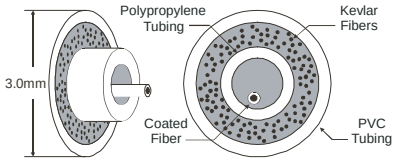
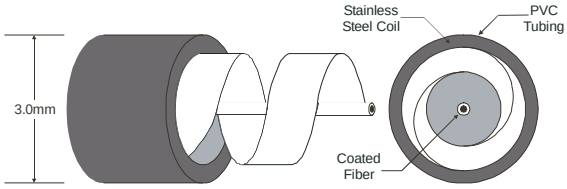
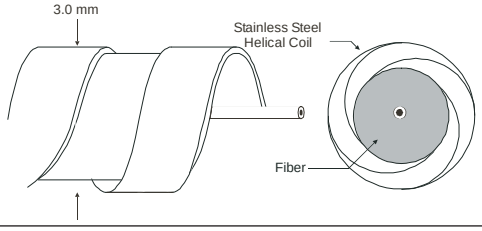
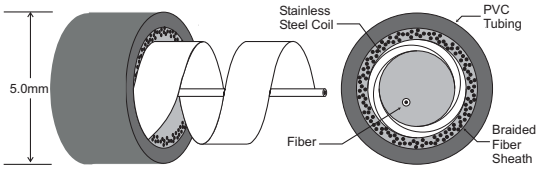
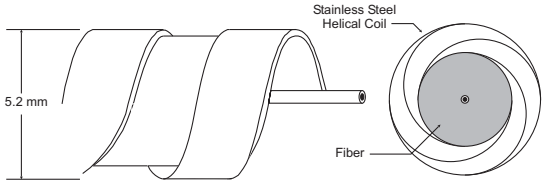
Polish Type	Appearance	Applications	Return Loss	Connectors
Flat		Multimode Fibers	-11 dB	1, 1.25, 1.4, 1.8 2F, 2.5, 3, 5, 5HP, 6, A3
Super PC		Standard Singlemode and PM Fibers	-40 dB	3S, 8, SC, LC, MU, E, MD, M8
Ultra PC		SM and PM systems needing low return loss when parts are connected	-50 dB	3U, 8U, SCU, STU, LCU
Angled PC (APC)		Systems needing lowest return losses at all times	-60 dB	3A, SCA, LCA, A3A, MDA
Angled Flat (AFC)		Fiber to free space delivery systems needing both low return losses and good repeatability when mated to lenses	-60 dB	1A, 1.25A, 1.4A, 2A, 2.5A, 3AF

Table 7: Standard Cable Construction

Jacket Code	ID (mm)	OD (mm)	Material / Applications	Construction	Picture
0.25 or 0.4	N/A	0.25 or 0.4	Uncabled. Base coating on the fiber only.		None
1	0.55	0.9	Hytrel (loose tube or tight buffer)[1] Minimal Protection. Used when space is an issue.		
2	1.04	2.0	PVC jacketed cable, with Kevlar fiber reinforcement. Used with LC and MU connectors.		
3	1.04	3.0	PVC jacketed cable, with Kevlar fiber reinforcement[1]. Standard for most applications.		
3A	1.57	3.0	Stainless steel coil armor, with black PVC jacket. Used in industrial environments, and with high power lasers,		
3AS	1.8	3.0	Stainless Steel (Helical) Cable. Can be sterilized. Used mostly with medical applications and high power lasers.		
5A	2.5	5.0	Stainless steel coil armor, with black PVC jacket, Kevlar fiber reinforcement. As per 3A cable, but with extra reinforcement for strain relief.		
5AS	3.1	5.2	Stainless Steel (Helical) Cable. Heavy duty version of 3AS cable.		

Notes:

[1] If the fiber is already offered in our standard tables with a coating code of 1 or 3, then the fiber is already precabled with 900 micron tight buffering protecting the coated fiber. Otherwise loose tubing is used to cable the fiber.

Table 8: Standard Laser Head Adapters[1]

Bar Code	Adapter Number (LH)	Description
817	1	1"-32 TPI Male Threaded Adapter
830	2	1.75" Disk Adapter with 4 holes on corners of 1" square
825	3	3/4" - 32TPI Male Threaded Adapter
826	4	5/8" - 32TPI Male Threaded Adapter
824	5	1/2"-20 TPI Male Threaded Adapter for Amoco lasers
919	6	5/8"-24 TPI Male Threaded Adapter
834	7	1.75" O.D. Female Adapter for cylindrical lasers without any mounting holes
938	8	1.50" O.D. Female Adapter for cylindrical lasers without any mounting holes
939	9	1.38" O.D. Female Adapter for cylindrical lasers without any mounting holes
841	10	1.25" O.D. Female Adapter for cylindrical lasers without any mounting holes
835	11	Post Mount with 1/4"-20 TPI hole
851	12	25 mm O.D. Male Adapter for Spindler and Hoyer Optical Bench
931	13	Polytec Laser Head Adapter
800	14	Disk Adapter with 4 holes on 0.625" square for Lightwave Electronic lasers
836	15	1.75" O.D. Disk Adapter with 4 holes on 1" square and 1"-32 TPI female thread in the middle
802	16	1/2"-40 TPI Male Threaded Adapter
850	17	Disk Adapter with 4 holes on 27mm bolt circle for Siemens Lasers
765	18	5/8"-24 TPI Female Laser Head Adapter for ILT lasers
928	19	Disk Adapter with 3 holes on a 2.25" diameter bolt circle for Omnichrome lasers
837	20	1.75" Disk Adapter with 4 holes on a 35 mm diameter bolt circle
15351	21	1.75" Disk Adapter with 3 holes on a 1.15" diameter bolt circle
15368	22	1.75" Disk Adapter with 3 holes on a 1.15" diameter bolt circle and 3/4" -32TPI female thread in the middle
19791	23	1.75" Disk Adapter with 4 holes on a 35 mm diameter bolt circle and 1" -32TPI female thread in the middle

Notes:

1 Visit our web site (www.ozoptics.com) for mechanical drawings of the laser head adaptors.

Table 9: Standard Achromat Lenses

Bar Code	Lens ID	Focal Length (mm)	Back Focal Length (mm)	Outer Diameter (mm)	Clear Aperture (mm)	Design Wavelength (nm)	Return Losses (dB)[1]	Suitable Collimator and Coupler Part Prefixes[2]	Suitable Focuser Part Prefixes[2]
570	3.5AC	3.5	2.73	2	1.75	400-700	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01, LPF-02, LPF-03, HPUFO-2X
20916	4.5AC	4.5	3.2	3	2.5	400-700	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01, LPF-02, LPF-03, HPUFO-2X
1804	6AC	6	5.2	3	2.5	400-700	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01, LPF-02, LPF-03, HPUFO-2X
15550	6AG[3]	6	4.4	6.35	3.5	300-400[4]	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, HPUFO-2X
574	6.3AG[4]	6.3	2.5	3	2	400-700	-40	HPUCO-2X, HPUC-2X	HPUFO-2X
1631	10AC	10	7.6	6	5.5	400-700	-40	LPC-02, LPC-03, LPC-04, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, HPUFO-2X
581	10AC	10	7.6	6	5.5	780-1600[5]	-40, -60	LPC-02, LPC-03, LPC-04, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, HPUFO-2X
583	16AC	16	13.4	8	7.5	400-700	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
584	20AC	20	18.5	10	9.5	400-700[5]	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
3373	20AC	20	17	10	9.5	780-1600[5]	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
588	25AC	25	22.4	12.5	12	400-700	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
589	25AC	25	22.2	12.5	12	780-1600[5]	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
590	30AC	30	27.5	12.5	12	400-700	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
593	35AC	35	32.4	12.5	12	400-700	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
595	44AC	44	41.1	14	13	400-700	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
5888	44AC	44	41.1	14	13	780-1600[5]	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
596	50AC	50	46.4	20	19	400-700	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
5039	50AC	50	46.4	20	19	780-1600[5]	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X

Notes:

1 Refers to LPC, LPF, and LPSC product prefix codes only. HPUC, HPUCO and HPUFO return losses depend on the connector type.

2 Refer to the data sheets on laser to fiber couplers, and fiber optic collimators and focusers for an explanation of these part number prefixes.

3 The 6AG lens is a doublet lens but it is not a true achromat lens. It is optimized to correct spherical aberration in the UV range, and not chromatic aberration. When ordering parts using these lenses, please specify the actual operating wavelength for the device.

4 The 6.3AG lens is an air-spaced achromat specifically designed for very high power coupling applications.

5 While these lenses have MgF2 antireflection coatings for 780 nm to 1600 nm wavelengths, they are not achromatic over the wavelength specified. Instead they are optimized to minimize aberration over the specified wavelength range. When ordering parts using these lenses, please specify the actual operating wavelength for the device.

Table 10: Standard Grin Lenses

Bar Code	Lens ID	Focal Length (nm)	Back Focal Length (mm)	Outer Diameter (mm)	Design Wavelength (nm)	Return Losses (dB)[1]	Suitable Collimator and Coupler Part Prefixes[2]	Suitable Focuser Part Prefixes[2]
5035	1.01GR	1.06@1550 nm	0.13	1.0	1250 -1600[3]	-40	LPC-01, LPC-02, LPC-03, LPC-05, LPC-06, LPC-07, LPSC-03	LPF-01, LPF-02, LPF-03, LPF-05, LPF-06, LPF-07
424	1.8GR	1.84@633 nm	0	1.8	630 - 690	-25	HUCO-1X, HUCO-3X, HUC-1X	N/A
456	1.8GR	1.88@830 nm	0	1.8	800 - 860	-25	HUCO-1X, HUCO-3X, HUC-1X	N/A
497	1.8GR	1.93@1550 nm	0	1.8	1250 -1600[3]	-25	HUCO-1X, HUCO-3X, HUC-1X	N/A
421	1.81GR	1.78@514 nm 1.84@633 nm	0.17	1.8	488 - 690[4]	-40	LPC-01, LPC-02, LPC-03, LPC-05, LPC-06, LPSC-03	LPF-01, LPF-02, LPF-03, LPF-05, LPC-06
455	1.81GR	1.90@830 nm	0.24	1.8	750 - 900[4]	-40	LPC-01, LPC-02, LPC-03, LPC-05, LPC-06, LPSC-03	LPF-01, LPF-02, LPF-03, LPF-05, LPC-06
493	1.81GR	1.95@1550 nm	0.30	1.8	1250 -1600[3]	-40, -50	LPC-01, LPC-02, LPC-03, LPC-05, LPC-06, LPSC-03	LPF-01, LPF-02, LPF-03, LPF-05, LPC-06
458	1.9GR	1.94@830 nm	-0.48	1.8	750 - 900[4]	-40	N/A	LPF-01, LPF-02, LPF-03, LPF-05, HPUFO-2X
500	1.9GR	1.99@1550 nm	-0.50	1.8	1250 -1600[3]	-40, -50	N/A	LPF-01, LPF-02, LPF-03, LPF-05, HPUFO-2X
439	2.13GR	2.07@830 nm	0.88	1.8	750 - 900[4]	-40, -50	LPC-01, LPC-02, LPC-03, LPC-05, LPC-06, LPSC-03	LPF-01, LPF-02, LPF-03, LPF-05, LPF-06
13303	2.13GR	2.10@980 nm	0.89	1.8	810 - 1330[4]	-40, -50	LPC-01, LPC-02, LPC-03, LPC-05, LPC-06, LPSC-03	LPF-01, LPF-02, LPF-03, LPF-05, LPF-06
4124	2.13GR	2.13@1550 nm	0.91	1.8	1250 -1600[3]	-40, -60	LPC-01, LPC-02, LPC-03, LPC-05, LPC-06, LPSC-03	LPF-01, LPF-02, LPF-03, LPF-05, LPF-06
407	2.6GR5	2.24@488 nm	0	2.0	475 - 505	-25	HUCO-1X, HUCO-3X, HUC-1X	N/A
410	2.6GR5	2.29@510 nm	0	2.0	495 - 525	-25	HUCO-1X, HUCO-3X, HUC-1X	N/A
412	2.6GR5	2.35@540 nm	0	2.0	525 - 555	-25	HUCO-1X, HUCO-3X, HUC-1X	N/A
3288	2.6GR5	2.60@830 nm	0	2.0	770 - 850	-25	HUCO-1X, HUCO-3X, HUC-1X	N/A
416	2.61GR5	2.60@633 nm	0.80	2.0	488 - 690[4]	-40	LPC-01, LPC-02, LPC-03, LPC-05, LPC-06, LPSC-03	LPF-01, LPF-02, LPF-03, LPF-05, LPF-06, HPUFO-2X
449	2.61GR5	2.62@830 nm	0.80	2.0	750 - 900[4]	-40	LPC-01, LPC-02, LPC-03, LPC-05, LPC-06, LPSC-03	LPF-01, LPF-02, LPF-03, LPF-05, LPF-06, HPUFO-2X
469	2.61GR5	2.84@1550 nm	0.88	2.0	1250 -1600[3]	-40, -50	LPC-01, LPC-02, LPC-03, LPC-05, LPC-06, LPSC-03	LPF-01, LPF-02, LPF-03, LPF-05, LPF-06, HPUFO-2X
433	3.2GR	3.11@633 nm	0.96	3.0	488 - 690[4]	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01, LPF-02, LPF-03, HPUFO-2X
2864	3.2GR	3.27@1550 nm	1.01	3.0	1250 -1600[3]	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01, LPF-02, LPF-03, HPUFO-2X
2134	4.7GR	4.53@633 nm	3.43	3.0	600 - 690	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01, LPF-02, LPF-03, HPUFO-2X
443	4.7GR	4.74@780 nm	3.65	3.0	700 - 850[4]	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01, LPF-02, LPF-03, HPUFO-2X
2865	4.7GR	4.89@1550 nm	3.76	3.0	1250 -1600[3]	-40, -50	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01, LPF-02, LPF-03, HPUFO-2X
445	6.6GR	6.22@780 nm	4.71	4.0	700 - 850[4]	-40	LPC-02, LPC-03, LPC-04, HPUCO-2X LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, HPUFO-2X
2731	18AGR	18.0@1550 nm	17.3	10	1520 - 1580	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
2730	30AGR	30.0@1550 nm	29.8	10	1520 - 1580	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
2817	50AGR	50.0@830 nm	49.1	20	800 - 860	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
4070	50AGR	50.0@1550 nm	49.1	20	1520 - 1580	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X

Notes:

1. Refers to LPC, LPF, LPSC and HUC product prefix codes only. HPUC, HPUCO and HPUFO return losses depend on the connector type.
2. Refer to the data sheets on laser to fiber couplers, and fiber optic collimators and focusers for an explanation of these part number prefixes.
3. These lenses are achromatic in performance and will function properly over the entire wavelength range specified.
4. While these lenses have MgF2 antireflection coatings for the wavelength ranges specified, they are not achromatic over the entire wavelength range. Only the lenses with the wavelength range listed as 1250 - 1600 nm are achromatic. When ordering parts for other wavelengths, please specify the actual operating wavelength for the device.
5. Subject to availability. These lenses are available for a limited time only.

Table 11: Standard Aspheric Lenses

Bar Code	Lens ID	Focal Length (nm)	Back Focal Length (mm)	Outer Diameter (mm)	Clear Aperture (mm)	AR Coating Wavelength Range (nm)[1]	Return Losses (dB)[2]	Suitable Collimator and Coupler Part Prefixes[3]	Suitable Focuser Part Prefixes[3]
501	1.1AS	1.13@830 nm	1.154	2.4	1.13	600 - 1050	-40	N/A[4]	LPF-01,LPF-02, LPF-03, HPUFO-2X
503	1.1AS	1.14@1550 nm	1.164	2.4	1.13	1000 - 1650	-40, -60	N/A[4]	LPF-01,LPF-02, LPF-03, HPUFO-2X
3130	1.4AS	1.44@633 nm	0.87	2.4	1.6	375 - 650	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01,LPF-02, LPF-03, HPUFO-2X
504	1.4AS	1.45@830 nm	0.88	2.4	1.6	600 - 1050	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01,LPF-02, LPF-03, HPUFO-2X
505	1.4AS	1.47@1550 nm	0.90	2.4	1.6	1000 - 1650	-40, -60	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01,LPF-02, LPF-03, HPUFO-2X
517	2AS	1.99@633 nm	1.08	3.0	2.0	375 - 650	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01,LPF-02, LPF-03, HPUFO-2X
519	2AS	2.00@830 nm	1.09	3.0	2.0	600 - 1050	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01,LPF-02, LPF-03, HPUFO-2X
524	2AS	2.03@1550 nm	1.10	3.0	2.0	1000 - 1650	-40, -60	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01,LPF-02, LPF-03, HPUFO-2X
506	2.7AS	2.70@633 nm	1.73	4.0	3.0	375 - 650	-40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
507	2.7AS	2.73@830 nm	1.76	4.0	3.0	600 - 1050	-40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
2055	2.7AS	2.76@1550 nm	1.79	4.0	3.0	1000 - 1650	-40, -60	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
529	3.9AS	3.87@633 nm	2.23	6.33	4.3	375 - 650	-40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
533	3.9AS	3.90@830 nm	2.26	6.33	4.3	600 - 1050	-40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
536	3.9AS	3.95@1550 nm	2.31	6.33	4.3	1000 - 1650	-40, -60	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
4512	5AS	4.95@633 nm	4.31	2.00	1.5	375 - 650	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01,LPF-02, LPF-03, HPUFO-2X
4514	5AS	5.00@830 nm	4.36	2.00	1.5	600 - 1050	-40	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01,LPF-02, LPF-03, HPUFO-2X
4516	5AS	5.07@1550 nm	4.43	2.00	1.5	1000 - 1650	-40, -60	LPC-01, LPC-02, LPC-03, HPUCO-2X, LPSC-03, HPUC-2X	LPF-01,LPF-02, LPF-03, HPUFO-2X
533	6.2AS	6.19@633 nm	3.39	7.2	5.0	375 - 650	-40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
556	6.2AS	6.25@830 nm	3.45	7.2	5.0	600 - 1050	-40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
557	6.2AS	6.34@1550 nm	3.54	7.2	5.0	1000 - 1650	-40, -60	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
20066	8AS	7.90@633 nm	5.73	9.94	8.6	345 - 650	-40	LPC-08, HPUCO-2X, HPUC-2X	LPF-08, HPUFO-2X
560	8AS	8.00@830 nm	5.83	9.94	8.6	600 - 1050	-40	LPC-08, HPUCO-2X, HPUC-2X	LPF-08, HPUFO-2X
1803	8AS	8.11@1550 nm	5.94	9.94	8.6	1000 - 1650	-40, -60	LPC-08, HPUCO-2X, HPUC-2X	LPF-08, HPUFO-2X
2863	11AS	11.00@633 nm	7.82	7.2	5.5	375 - 650	-40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
562	11AS	11.14@830 nm	7.96	7.2	5.5	600 - 1050	-40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
565	11AS	11.32@1550 nm	8.14	7.2	5.5	1000 - 1650	-40, -60	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
20153	13.9AS	13.86@633 nm	11.99	6.325	5.1	345 - 650	-40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
15053	13.9AS	13.95@830 nm	12.08	6.325	5.1	600 - 1050	-40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
4515	13.9AS	14.24@1550 nm	12.37	6.325	5.1	1000 - 1650	-40, -60	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
17173	18AS	18.2@633 nm	16.8	6.50	5.5	375 - 650	-40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
16399	18AS	18.4@830 nm	17.0	6.50	5.5	600 - 1050	-40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
15117	18AS	18.68@1550 nm	17.28	6.50	5.5	1000 - 1650	-40, -60	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X

Notes:

1 While the coatings on the lenses are broadband in nature, the lenses themselves are not achromatic over the entire wavelength range. The lenses with the wavelength range listed as 1000 - 1650 nm are achromatic over a 1250 to 1600 nm range. When ordering parts for other wavelengths, please specify the exact operating wavelength for the device.

2 Refers to LPC, LPF and LPSC product prefix codes only. HPUC, HPUCO and HPUFO return losses depend on the connector type.

3 Refer to the data sheets on laser to fiber couplers, and fiber optic collimators and focusers for an explanation of these part number prefixes.

4 These lenses are designed for focuser applications only. For this lens only the working distance specified is the distance which produces a magnification of 4:1.

Table 12: Standard Plano-Convex and Biconvex Lenses

Bar Code	Lens ID	Focal Length (nm)	Back Focal Length (mm)	Diameter (mm)	Clear Aperture (mm)	Standard Wavelengths	Return Losses (dB)[1]	Suitable Collimator and Coupler Part Prefixes[2]	Suitable Focuser Part Prefixes[2]
598	5BQ	5.82@350 nm	4.73@350 nm	6	5	180 - 400	-25, -40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
599	5BQ	6.05@633 nm 6.14@1064 nm	4.95@633 nm	6	5	450 - 650, 1010 - 1110	-25, -40	LPC-02, LPC-03, LPC-04, LPC-08, HPUCO-2X, LPSC-03, HPUC-2X	LPF-02, LPF-03, LPF-04, LPF-08, HPUFO-2X
604	10BQ	10.77@350 nm	9.43@350 nm	10	9	180 - 400	N/A	LPC-08, HPUCO-2X, HPUC-2X	LPF-08, HPUFO-2X
603	10BQ	11.21@633 nm 11.39@1064 nm	9.87@633 nm	10	9	450 - 650, 1010 -1110	N/A	LPC-08, HPUCO-2X, HPUC-2X	LPF-08, HPUFO-2X
1914	15PX	15.0@633 nm	13.3@633 nm	10	9	400 - 700	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X
612	25PQ	28.0@1064 nm	26.7@1064 nm	12.5	11.5	1010 - 1110	N/A	HPUCO-2X, HPUC-2X	HPUFO-2X

Notes:

1 Refers to LPC, LPF and LPSC product prefix codes only. HPUC, HPUCO and HPUFO return losses depend on the connector type.

2 Refer to the data sheets on laser to fiber couplers, and fiber optic collimators and focusers for an explanation of these part number prefixes.