

In ANSI/TIA-568.3-D, the TIA adopted the nomenclature for fiber found in the international standard ISO/IEC 11801-1. The multimode fiber is prefixed with “OM” and the singlemode mode “OS”.

Each “OM” has a Minimum Modal Bandwidth (MBW) requirement.

Wavelength		Minimum Modal Bandwidth MHz·km		
		Overfilled* launch bandwidth		Effective* laser launch bandwidth
Fiber Type	Core diameter	850 nm	1300 nm	850 nm
OM1	62.5 µm	200	500	Not specified
OM2	50 µm	500	500	Not specified
OM3	50 µm	1,500	500	2,000
OM4	50 µm	3,500	500	4,700
OM5	50 µm	3,500	500	4,700

*Overfilled is with an LED source, effective is with a VCSEL. Loss length testing to ISO/IEC or TIA must be done with an LED compliant with an encircled flux launch.

	What it really means to you			
	1000BASE-SX	10GBASE-SR	40GBASE-SR4	100GBASE-SR4
OM1	275 m	33 m	Not specified	Not specified
OM2	550 m	82 m	Not specified	Not specified
OM3	550 m	300 m	100 m	70 m
OM4	550 m	400 m*	150 m	100 m
OM5	550 m	400 m*	150 m	100 m

* The IEEE in conjunction with the TIA is supporting 10GBASE-SR to 400 m over OM4.

Cautionary note: In ANSI/TIA-568-B.3, the modal bandwidth of 62.5 µm fiber was 160 MHz·km, not the 200 MHz·km found in the current ANSI/TIA-568.3-D. This change was done to harmonize with ISO/IEC 11801-1. That would reduce the distance for 1000BASE-SX to 220 m and 10GBASE-SR to 26 m.

A loss limit associated with these distances:

	1000BASE-SX	10GBASE-S	40GBASE-SR4	100GBASE-SR4
OM1	2.60 dB	2.4 dB	Not supported	Not supported
OM2	3.56 dB	2.3 dB	Not supported	Not supported
OM3	3.56 dB	2.6 dB	1.9 dB	1.9 dB
OM4	Not specified	2.9 dB	1.5 dB	1.5 dB
OM5	Not specified	2.9 dB	1.5 dB	1.5 dB

In your design, you have to take into account BOTH distance and loss to ensure your application will work. OM4 fiber needs a reduced fiber loss in order to support 100GBASE-SR4 to 100 m.

	850 nm	1300 nm	1310 nm	1550 nm
OM1	3.5 dB/km	1.5 dB/km		
OM2	3.5 dB/km	1.5 dB/km		
OM3	3.0 dB/km	1.5 dB/km		
OM4*	3.0 dB/km	1.5 dB/km		
OM5*	3.0 dB/km	1.5 dB/km		
OS1a ISP			1.0 dB/km	1.0 dB/km
OS1a OSP			0.5 dB/km	0.5 dB/km
OS2 ISP			1.0 dB/km	1.0 dB/km
OS2 OSP			0.5 dB/km	0.5 dB/km

ISP = Inside plant, OSP = Outside plant (Applicable to TIA only)

*The values above for OM4 and OM5 are taken from ANSI/TIA-568.3-D. In TIA-492AAAD, the values for OM4 are 2.5 dB/km @ 850 nm and 0.8 dB/km @ 1300 nm. The same is true for OM5 in TIA-942AAAE.



While OM5 has similar performance values to OM4 for attenuation and distance supported, it has a special characteristic that differentiates it. OM5 fiber is designed to be used at wavelengths just beyond 850 nm, specifically, 850 nm, 880 nm, 910 nm, and 940 nm. This means that it can support four simultaneous transmissions with Wave Division Multiplexing. There is an attenuation value for the 953 nm wavelength, 2.3 dB per km. Field testing of OM5, however, only needs to be done at 850 and 1300 nm wavelengths.

IMPORTANT:

When you setup your DSX CableAnalyzer™ Cable Type for fiber, make sure you select the fiber with the correct modal bandwidth. It will not affect the outcome of your TIA or ISO/IEC loss length test, but it will affect what shows up at the bottom of the test report in LinkWare™ for Network Compliant Standards.