

OM1, OM2, OM3, OM4, OM5 and OS1a, OS2 Fiber

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 CertiFiber™ Pro Cable Type, 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.