

Fiber Type vs. Speed and Distance

As you can see from the chart below, different Fiber core types have vastly different limitations for speed and maximum distance.

The 62.5/125 μm (AKA: OM1) has been the most popular multimode fiber choice throughout the 80's, 90's and into the early 2000's and was the most common multimode fiber used and yet it has the lowest data carrying capacity and shortest distance limitations as compared with other Multimode fiber types. It is generally accepted that 62.5/125 Multimode will soon be obsolete for the purpose of new installations.

NOTE: If you currently have 62.5/125 μm fiber installed in your office, building or campus you need to continue to use 62.5/125 μm fiber patch cables to connect to it. Attempting to mate two different fiber core sizes can lead to high loss and is therefore strongly not recommended.

The 50/125 μm core size comes in three different classifications (OM2, OM3 and OM4). Please note that OM3 is usually just referred to as 10GIG since it is generally the best choice for 10 Gigabit Ethernet over Multimode fiber and was designed specifically for that purpose (unless you need the extra distance provided by OM4).

Designation	Core/Cladding Diameter (μm)	Type	Gigabit Ethernet Distance (meters)	10 Gigabit Ethernet Distance (meters)
OM1*	62.5/125	Multimode	300 Meters at 850 nm 600 Meters at 1310 nm	33 Meters at 850 nm 300 Meters at 1310 nm
OM2*	50/125	Multimode	600 Meters at 850 nm 600 Meters at 1310 nm	82 Meters at 850 nm 300 Meters at 1310 nm
OM3	50/125	Multimode	1000 Meters at 850 nm 600 Meters at 1310 nm	300 Meters at 850 nm 300 Meters at 1310 nm
OM4	50/125	Multimode	1040 Meters at 850 nm 600 Meters at 1310 nm	550 Meters at 850 nm 300 Meters at 1310 nm
ITU-T G.652.D	9/125	Singlemode	5 km at 1310 nm 5 km at 1310 nm	10 km at 1310 nm 10 km at 1550 nm

* Please be sure to also check the performance specifications of the Network Equipment that you plan to use in order to be sure of speed and distance with a particular fiber optic cable type. This information can usually be found on the Equipment Manufacturer's website or by calling their Tech Support department.

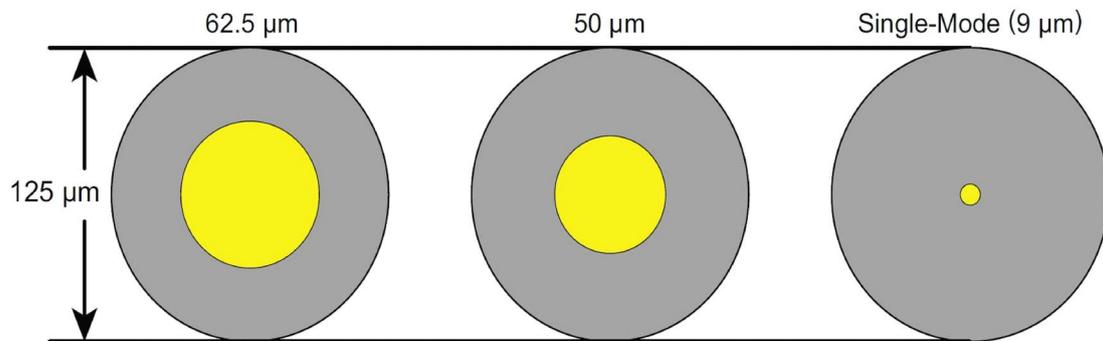
Singlemode fiber, because of the more expensive electronics required for it is usually used for much greater distances. So for reasons of practicality, most Local Area Networks (LANs) will typically use one form or another of Multimode Cable.

Here are some useful facts to consider:

- OM1 (62.5 μm) fiber has reached its performance limit
- In lab testing, 50 μm fiber offers as much as ten times the bandwidth of 62.5 μm fiber
- OM3 and OM4 fibers will support upcoming 40 and 100 Gb/s speeds. Only OM3 and OM4 Multimode fibers are included in the IEEE 802.3ba standard for next-generation 40 and 100 Gb/s Ethernet. OM1 and OM2 fibers are not supported media types for these applications.
- Mixing fiber types is strongly not recommended. Please read the above article for more information on this.

Optical Fiber Core Diameters

Relative Size Comparison



NOTE 1: This mini-article was intended for convenience in finding quick information as a starting point in planning a network. Please consult with a network designer before attempting to design a new network.

NOTE 2: Please be sure to also check the performance specifications of the Network Equipment that you plan to use in order to be sure of speed and distance with a particular fiber optic cable type. This information can usually be found on the Equipment Manufacturer's website or by calling their Tech Support department.