



GENERAL DESCRIPTION

R&M' offers two kind of standard singlemode fibers for their cables and cords. Customers can choose between an enhanced full-spectrum singlemode fiber known as the ITU-T G.657.A1 fiber. Or then an enhanced low macro bending sensitive fiber also known as an ITU-T G.657.A2/B2 fiber. Please note, today with R&M the G.652.D fiber does not exist as a stand-alone fiber type anymore.

The **G.657.A1** fiber is a an ITU-T Recommendation G652.D compliant optical fiber that exceeds the ITU-T Recommendation G.657.A1 standard and still splices the same as the installed base of standard singlemode fibers. The fiber provides improved performance across the entire wavelength spectrum due to its low attenuation in the 1383 nm water-peak region.

The **G.657.A2/B2** fiber is optimized for a wide array of indoor installations. Its preferred use is in office installations, for patch cords, interconnection cables and for Fiber-to-the-Home networks. The fiber delivers enhanced macro bending performance while maintaining compatibility with current equipment, practices and procedures. The G.657.A2/B2 fiber remains compatible and fully compliant with ITU-T Recommendation G.652.D.

FTTH installation cables, patch cords and buffered fibers with **ITU-T G.657.B3** fiber are also optionally available from R&M. This is an improved singlemode fiber with ultra-low bend sensitivity designed for the challenging use of FTTH applications. R&M uses a G.657.B3 fiber that is compatible and fully compliant with the ITU-T G.652.D fiber.

OPTICAL SPECIFICATION

Designation		G.657.A1	G.657.A2	G.657.B3
Attenuation maximum in cable	1310 nm	≤ 0.40 dB/km	≤ 0.40 dB/km	≤ 0.40 dB/km
	1383 nm ¹	≤ 0.40 dB/km	≤ 0.40 dB/km	≤ 0.40 dB/km
	1550 nm	≤ 0.25 dB/km	≤ 0.25 dB/km	≤ 0.25 dB/km
	1625 nm	≤ 0.25 dB/km	≤ 0.25 dB/km	≤ 0.25 dB/km
Dispersion	1310 nm	≤ 3.15 ps/km × nm	≤ 3.15 ps/km × nm	
	1550 nm	≤ 18.0 ps/km × nm	≤ 18.0 ps/km × nm	≤ 18.5 ps/km × nm
	1625 nm	≤ 22.0 ps/km × nm	≤ 23.0 ps/km × nm	≤ 23.0 ps/km × nm
Zero dispersion wavelength, λ ₀		1304 – 1324 nm	1304 – 1324 nm	1300 – 1324 nm
Zero dispersion slope	ps/(nm ² × km)	≤ 0.092	≤ 0.092	≤ 0.092
Point Discontinuity		≤ 0.05 dB	≤ 0.05 dB	≤ 0.05 dB
Cut-off wavelength λ _{cc}		≤ 1260 nm	≤ 1260 nm	≤ 1260 nm
Mode field diameter	1310 nm	9.2 ± 0.4 μm	8.6 ± 0.4 μm	8.7 ± 0.5 μm
	1550 nm	10.4 ± 0.5 μm	9.6 ± 0.5 μm	9.7 ± 0.6 μm
Polarization mode dispersion (PMD)	cabled	≤ 0.1 ps/√km	≤ 0.2 ps/√km	≤ 0.2 ps/√km
	link value	≤ 0.05 ps/√km	≤ 0.06 ps/√km	≤ 0.06 ps/√km
Group index of refraction	1310 nm	1.467	1.467	1.467
	1550 nm	1.468	1.468	1.468
Macro bending loss, 10 turns, r = 15 mm mandrel	1550 nm	≤ 0.1 dB	≤ 0.03 dB	--
	1625 nm	≤ 0.3 dB	≤ 0.1 dB	--
Macro bending loss, 1 turn, r = 10 mm mandrel	1550 nm	≤ 0.5 dB	≤ 0.1 dB	≤ 0.03 dB
	1625 nm	≤ 1.5 dB	≤ 0.2 dB	≤ 0.1 dB
Macro bending loss, 1 turn, r = 7.5 mm mandrel	1550 nm	--	≤ 0.5 dB	≤ 0.08 dB
	1625 nm	--	≤ 0.9 dB	≤ 0.25 dB
Macro bending loss, 1 turn, r = 5.0 mm mandrel	1550 nm	--	--	≤ 0.15 dB
	1625 nm	--	--	≤ 0.45 dB

¹ Attenuation values at this wavelength represent post-hydrogen aging performance according to IEC 60793-2-50

DATA SHEET

Singlemode Fiber

DIMENSIONAL SPECIFICATION

Designation	G.657.A1	G.657.A2	G.657.B3
Cladding diameter	125.0 ± 0.7 µm	125.0 ± 0.7 µm	125.0 ± 0.7 µm
Cladding non-circularity	≤ 0.7 %	≤ 0.7 %	≤ 0.7 %
Core (MFD) non-circularity	≤ 6 %	≤ 6 %	≤ 6 %
Core - cladding concentricity	≤ 0.5 µm	≤ 0.5 µm	≤ 0.5 µm
Primary coating diameter - uncolored	242 ± 7 µm	242 ± 7 µm	242 ± 7 µm
Primary coating diameter - colored	250 ± 15 µm	250 ± 15 µm	250 ± 15 µm
Primary coating non-circularity	≤ 5 %	≤ 5 %	≤ 5 %
Primary coating-cladding concentricity error	≤ 12.0 µm	≤ 12.0 µm	≤ 12.0 µm

MECHANICAL and ENVIRONMENTAL SPECIFICATION

Designation	G.657.A1	G.657.A2	G.657.B3
Coating material	dual layer UV curable acrylate	dual layer UV curable acrylate	dual layer UV curable acrylate
Tensile proof test (fiber elongation ≤ 1%)	≥ 100 kpsi	≥ 100 kpsi	≥ 100 kpsi
Operation temperature range -60°C to 85°C	≤ 0.05 dB/km	≤ 0.05 dB/km	≤ 0.05 dB/km
Water immersion 23°C ±2°C	≤ 0.05 dB/km	≤ 0.05 dB/km	≤ 0.05 dB/km
Heat aging	≤ 0.05 dB/km	≤ 0.05 dB/km	≤ 0.05 dB/km
Damp heat	≤ 0.05 dB/km	≤ 0.05 dB/km	≤ 0.05 dB/km

STANDARDS

Designation	G.657.A1	G.657.A2
This fiber fulfills the requirements of:	• IEC 60793-2-50 Cat. B.1.3 and B6.a1 • ITU Recommendation G.657 table A1 • ITU Recommendation G.652 table D (including older ITU designations A, B and C) • TIA/EIA-492 CAAC	• IEC 60793-2-50 Cat. B.1.3, B6a.1, B6a.2 • ITU Recommendation G.657 table A2/B2 • ITU Recommendation G.652 table D (including older ITU designations A, B and C) • TIA/EIA-492 CAAC
When cabled, the fibers fulfil the requirements for use in a number of cabling systems, among them is:	• EN 50 173-1: 2011, cat. OS1 + OS2 • ISO/IEC 24702: 2006, cat. OS1 + OS2 • ISO/IEC 11801: 2002, cat. OS1 + OS2 • IEEE 802.3 - 2002 inkl. 802.3 Section Four	
Testing methods are in accordance with the following standards:	• IEC 60793-1-XX	

Designation	G.657.B3
This fiber fulfills the requirements of:	• IEC/EN 60793-2-50 Cat. B.1.3 und B6b.3 • ITU Recommendation G.657 Tabelle B3 • ITU Recommendation G.652 Tabelle D (inkl. der alten Bezeichnungen A, B und C) • TIA/EIA-492 CAAC
When cabled, the fibers fulfil the requirements for use in a number of cabling systems, among them is:	• EN 50 173-1: 2011, cat. OS1 + OS2 • ISO/IEC 24702: 2006, cat. OS1 + OS2 • ISO/IEC 11801: 2002, cat. OS1 + OS2 • IEEE 802.3 - 2002 inkl. 802.3 Section Four
Testing methods are in accordance with the following standards:	• IEC 60793-1-XX