



FIBER OPTIC CABLE ASSEMBLY PERFORMANCE

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1.0 SCOPE

The scope of this document outlines the performance criteria met by a Legrand fiber optic cable assembly. Each Legrand fiber optic cable assembly is certified to meet or exceed the conditions specified herein. Detailed product specifications may supersede this document.

2.0 STANDARDS REFERENCED

This document makes specific reference to the following. Latest publications of referenced standards are used, including any published addenda:

TIA-455-21	Mating Durability For Fiber Optic Interconnecting Devices
TIA-455-107	Fiber Optic Test Procedure: Return Loss
TIA-455-171	Fiber Optic Test Procedure: Insertion Loss
ANSI/TIA-568.3-E	Optical Fiber Cabling and Components Standard
TIA-604-2	Optical Fiber Connector Intermateability Standard
TIA-604-3	Optical Fiber Connector Intermateability Standard
TIA-604-4	Optical Fiber Connector Intermateability Standard
TIA-604-5	Optical Fiber Connector Intermateability Standard
TIA-604-10	Optical Fiber Connector Intermateability Standard
TIA-604-12	Optical Fiber Connector Intermateability Standard
TIA-604-18	Optical Fiber Connector Intermateability Standard
TIA-604-19	Optical Fiber Connector Intermateability Standard

3.0 CABLE ASSEMBLY REQUIREMENTS

3.1 OPTICAL PERFORMANCE CHARACTERISTICS:

Performance tier levels are defined in Tables 1a, 1b, 1c, and 3 for singlemode assemblies (by endface polish style) and in Tables 2 and 4 for multimode assemblies. In cases where multiple tier levels are defined, the assembly shall be in accordance with Tier 1 (Infinium Core) unless explicitly indicated otherwise in the detail specification.

3.1.1 Singlemode Cable Assemblies

3.1.1.1 Tests are performed at wavelengths of $1310\pm 30\text{nm}$ and $1550\pm 30\text{nm}$.

3.1.1.2 Acceptable Insertion Loss for a singlemode fiber shall not exceed the value specified in the appropriate table (Table 1a, 1b, 1c, or 3). For cable assemblies that are terminated at both ends with acclAIM™* connectors, tests are performed in accordance with TIA-455-171 Method E3. For all other cable assemblies, tests are performed in accordance with TIA-455-171 Method D3. Any data card with data figure or test report provided with the assembly shall report test results for both wavelengths.

3.1.1.3 Acceptable Return Loss for a singlemode fiber shall be in accordance with the appropriate table (Table 1a, 1b, 1c, or 3). Tests are performed in accordance with TIA-455-107 or an equivalent test procedure.

* acclAIM is a trademark of Legrand.



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3.1.2 Multimode Cable Assemblies

3.1.2.1 Tests are performed at wavelengths of 850±30nm and 1300±30nm.

3.1.2.2 Acceptable Insertion Loss for a multimode fiber shall not exceed the value specified in the appropriate table (Table 2 or 4). For cable assemblies that are terminated at both ends with acclAIM™ connectors, tests are performed in accordance with TIA-455-171 Method E4. For all other cable assemblies, tests are performed in accordance with TIA-455-171 Method D4. Any data card with data figure or test report provided with the assembly shall report test results for both wavelengths.

3.1.2.3 Acceptable Return Loss for a multimode fiber shall be in accordance with the appropriate table (Table 2 or 4). Tests are performed in accordance with TIA-455-107 or an equivalent test procedure.

	Tier 1 (Infinium Core)		
	IL (typical dB)	IL (max dB)	RL (min dB)
LC	0.30	0.50	40
SC	0.30	0.50	40
ST	0.30	0.50	40
FC	0.30	0.50	40
MTRJ	0.30	0.50	40

Table 1a Singlemode Optical Performance, "PC" Endface Polish Style

	Tier					
	1 (Infinium Core)		2 (Infinium Ultra)		3 (Infinium Quantum)	Tier 1-3 (Infinium Core - Infinium Quantum)
	IL (typical dB)	IL (max dB)	IL (typical dB)	IL (max dB)	IL (max dB)	RL (min dB)
LC	0.10	0.40	0.10	0.25	-	65
SC	0.10	0.40	0.10	0.25	-	65
ST	0.10	0.40	0.10	0.25	-	65
FC	0.10	0.40	0.10	0.25	-	65
MTP [†] /MPO	0.30	0.75	0.30	0.35	0.235	55
MTP [†] -16/MPO-16	0.30	0.75	0.30	0.35	0.235	55

Table 1b Singlemode Optical Performance, "APC" Endface Polish Style

[†] MTP is a registered trademark of US Conec Ltd.



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	Tier					
	1 (Infinium Core)		2 (Infinium Ultra)		3 (Infinium Quantum)	Tier 1-3 (Infinium Core - Infinium Quantum)
	IL (typical dB)	IL (max dB)	IL (typical dB)	IL (max dB)	IL (max dB)	RL (min dB)
LC	0.10	0.30	0.10	0.25	0.14	55
MDC	0.10	0.30	0.10	0.25	-	55
SN [®]	0.10	0.30	0.10	0.25	-	55
acclAIM [™] *	0.10	0.30	-	-	-	55
CS [®] /SEN	0.10	0.30	0.10	0.25	-	55
SC	0.10	0.30	0.10	0.25	-	55
ST	0.10	0.30	0.10	0.25	-	55
FC	0.10	0.30	0.10	0.25	-	55

* This table only applies to cable assemblies that are not terminated at both ends with acclAIM[™] connectors. SN and CS are registered trademarks of Senko Advanced Components, Inc.

Table 1c Singlemode Optical Performance, "UPC" Endface Polish Style

	Tier						
	1 (Infinium Core)		3 (Infinium Ultra)		4 (Infinium Quantum)	1 (Infinium Core) & 3 (Infinium Ultra)	4 (Infinium Quantum)
	IL (typical dB)	IL (max dB)	IL (typical dB)	IL (max dB)	IL (max dB)	RL (min dB)	RL (min dB)
LC	0.10	0.30	0.10	0.15	0.10	40	
MDC	0.10	0.30	0.10	0.15	-	40	-
SN [®]	0.10	0.30	0.10	0.15	-	40	-
acclAIM [™] *	0.10	0.30	-	-	-	40	-
CS [®] /SEN	0.10	0.30	0.10	0.15	-	40	-
SC	0.25	0.50	0.10	0.15	0.10	26	40
ST	0.25	0.50	0.10	0.15	-	26	-
FC	0.25	0.50	0.10	0.15	-	26	-
MTRJ	0.30	0.50	-	-	-	26	-
MTP [®] /MPO	0.30	0.75	0.30	0.35	0.25	20	40**
MTP [®] -16/MPO-16	0.30	0.75	0.30	0.35	0.25	20	40**

* This table only applies to cable assemblies that are not terminated at both ends with acclAIM[™] connectors.

** MM MPO/MPO-16 is APC polished for Tier 4 (Infinium Quantum) performance

Table 2 Multimode Optical Performance



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Infinium Core		Tier Infinium Ultra		Infinium Core - Ultra
LINK IL (typical dB)	LINK IL (max dB)	LINK IL (typical dB)	LINK IL (max dB)	CONNECTOR RL (min dB)
0.45	0.75	TBD	TBD	55

Table 3 Singlemode Optical Performance, "UPC" Endface Polish Style – acclAIM™ → acclAIM™

Infinium Core		Tier Infinium Ultra		Infinium Core - Ultra
LINK IL (typical dB)	LINK IL (max dB)	LINK IL (typical dB)	LINK IL (max dB)	CONNECTOR RL (min dB)
0.40	0.60	TBD	TBD	40

Table 4 Multimode Optical Performance – acclAIM™ → acclAIM™

3.1.3 General Performance Characteristics

- 3.1.3.1 Reference quality launch cables and connectors are optional. For insertion loss tests on cable assemblies that are terminated at both ends with acclAIM™ connectors performed in accordance with TIA-455-171 Method E3 or E4, the reference launch/receive cable connection zero reference level measurement is not applicable in the implementation of the method.
- 3.1.3.2 A loss value (dB) attributed to cable length is added to the insertion loss values reported per Section 3.1.1 and Section 3.1.2. The added loss value due to cable length is equal to the fiber attenuation value in dB/m multiplied by the cable length in meters as measured from ferrule tip to ferrule tip. The fiber attenuation value applied is dependent on cable structure since fiber type, core/cladding diameter, cable construction, and test wavelength can contribute to the value.
 - 3.1.3.2.1 Typical singlemode 9μm/125μm diameter fiber within a loose tube buffer exhibits 0.0005 dB/m at a test wavelength of 1310nm and 1550nm.
 - 3.1.3.2.2 Typical singlemode 9μm/125μm diameter fiber within a tight tube buffer exhibits 0.0010 dB/m at a test wavelength of 1310nm and 1550nm.
 - 3.1.3.2.3 Typical multimode 50μm/125μm diameter fiber exhibits 0.0030 dB/m at a test wavelength of 850nm and 0.0010 dB/m at a test wavelength of 1300nm.
 - 3.1.3.2.4 Typical multimode 62.5μm/125μm diameter fiber exhibits 0.0035 dB/m at a test wavelength of 850nm and 0.0015 dB/m at a test wavelength of 1300nm.

3.2 GENERAL CHARACTERISTICS

- 3.2.1 The entire fiber optic assembly shall conform to ANSI/TIA-568.3-E.
- 3.2.2 Connector durability shall be in accordance with ANSI/TIA-568.3-E and a maximum change in insertion loss of 0.3dB @ 200 cycles when tested in accordance with TIA-455-21; acclAIM™ connector durability shall be qualified to 200 cycles.



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3.2.3 Fiber connectors shall meet applicable TIA intermateability standard as listed below:

- ST; TIA-604-2
- FC; TIA-604-4
- LC; TIA-604-10
- MTP®-16/MPO-16; TIA-604-18
- SC; TIA-604-3
- MTP®/MPO; TIA-604-5
- MTRJ; TIA-604-12
- CS®/SEN; TIA-604-19
- MDC; -
- acclAIM™; -
- SN®; -

3.2.4 A protective dust cap shall cover every fiber connector ferrule upon satisfactory completion of testing.