



AEROSPACE INFORMATION REPORT	AIR6282™	REV. A
	Issued 2015-06 Revised 2021-06	
	Superseding AIR6282	
Fiber Optic Harsh Environment Test Methods Cross Reference Document		

RATIONALE

Currently the qualification process of fiber optic components to aerospace requirements involves in some cases referencing test methods that have been prepared for areas not related to the aerospace community where the test methods and required test results must be adapted to support the requirements of qualifying fiber optic components for aerospace. AIR6282 provides cross reference matrices to allow selection of the most suitable test methods for use in the qualification process of aerospace fiber optic components.

1. SCOPE

This report provides cross reference matrices detailing current test methods used in the qualification processes of fiber optic connectors, termini and cables for aerospace, telecommunications, and naval applications. The cross-reference allows the end user to select the test methods most suitable for qualifying a component, or to identify alternative test methods where a specific test is not defined in a referenced document. The report also provides information on what area each type of referenced document has been developed for.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this document to the extent specified herein. The latest issue of SAE publications shall apply. The applicable issue of other publications shall be the issue in effect on the date of the purchase order. In the event of conflict between the text of this document and references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

MA5405 Splices, Fiber Optics, For Aerospace Inter-Connection Systems

2.1.2 ARINC Publications

Available from ARINC, 2551 Riva Road, Annapolis, MD 21401-7435, Tel: 410-266-4000, www.arinc.com.

ARINC801 Fiber Optic Connectors

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For more information on this standard, visit
<https://www.sae.org/standards/content/AIR6282A/>

2.1.3 Telecommunications Industry Association (TIA) Publications

Telecommunications Industry Association (TIA), 1320 N. Courthouse Road, Suite 200, Arlington, VA 22201. Available from IHS Standards Store, 15 Inverness Way East, Englewood, CO 80112, global.ihs.com.

TIA-455 Fiber Optic Test Procedures

EIA-364 Electrical Connector/Socket Test Procedures Including Environmental Classifications

2.1.4 International Electrotechnical Commission (IEC)

Available from IEC Central Office, 3, rue de Varembe, P.O. Box 131, CH-1211 Geneva 20, Switzerland, Tel: +41 22 919 02 11, www.iec.ch.

IEC60793 Optical Fibres, Measurement Methods and Test Procedures

IEC60794 Optical Fibre Cables

IEC61300 Fiber optic interconnecting devices and passive components, Basic Test and Measurement Procedures

2.1.5 Comité Européen de Normalisation (CEN) Publications

Available from Avenue Marnix 17, B-1000 Brussels, Belgium.

EN 2591 Aerospace Series, Elements of Electrical and Optical Connection - Test Methods

EN 3745 Aerospace series, Fibers and Cables, Optical Aircraft Use - Test Methods

2.1.6 Telcordia Technologies Publications

Available from Technologies, Inc., One Ericsson Drive, RRC 4A-1060, Piscataway, NJ 088564-4156, USA.

GR-20-CORE Generic Requirements for Optical Fiber and Optical Fiber Cable

GR-326-CORE Generic Requirements for Singlemode Optical Connectors and Jumper Assemblies

2.1.7 U.S. Government Publications

Copies of these documents are available online at <https://quicksearch.dla.mil>.

MIL-PRF-24623 Splice, Fiber Optic Cable, General Specification For

MIL-PRF-49291 Fiber, Optical, (Metric) General Specification For

MIL-PRF-85045 Performance Specification, Cables, Fiber Optics, (Metric), General Specification For

MIL-STD-810 Department of Defense Test Method Standard

MIL-STD-1678 Fiber Optics Cabling Systems Requirements and Measurements

MIL-PRF-28876 Military Specification: Connectors, Fiber Optic, Circular, Plug and Receptacle Style, Multiple Removable Termini, General Specification for (Naval applications)

3. OPTICAL FIBER AND FIBER OPTIC CABLE

This section provides details of test methods applicable to the qualification process for aerospace optical fiber and fiber optic cables.

MIL-PRF-49291, Fiber Optical Cable (Metric); MIL-PRF-85045, Performance Specification, Cables, Fiber Optics, (Metric); and AS5382, Fiber Optic Cables test methods refer to TIA-455, Standard Test Procedure for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices, and Other Fiber Optic Components.

NOTE: Unpopulated test requirements have been identified as a requirement, but no test method has been identified.

3.1 Optical Fiber

MECHANICAL	TEST REQUIREMENT	EN 3745	IEC60793	TIA-455	OTHER
	CORE DIAMETER (MM)	202 ¹	1-20	58	-
	CORE DIAMETER (SM)	202 ¹	1-20	27	-
	CORE NON-CONCENTRICITY (MM)	202 ¹	1-20	158	-
	CORE NON-CONCENTRICITY (SM)	202 ¹	1-20	27	-
	CLADDING DIAMETER (MM)	202 ¹	1-21	58	-
	CLADDING DIAMETER (SM)	202 ¹	1-21	27	-
	CORE/CLADDING CONCENTRICITY ERROR	202 ¹	1-21	176	-
	PRIMARY BUFFER/COATING DIAMETER	202 ¹	1-21	27	-
	PRIMARY BUFFER/COATING NON-CONCENTRICITY	202	1-30	27	-
	PROOF TEST	501	1-30	31	-
	TENSILE STRENGTH	502	1.31	-	Telcordia GR-1209-5.4.3.4
STRIPPABILITY	701	1-32	178	-	

¹ This test method refers to IEC 60793-1 Measurement methods and test procedures Part 1.

Optical Fiber (Continued)

OPTICAL	TEST REQUIREMENT	EN 3745	IEC60793	TIA-455	OTHER
	ATTENUATION - MULTIMODE	301	1-40	78	-
	ATTENUATION - SINGLEMODE	301	1-40	78	-
	BANDWIDTH	303	1-41	204	-
	CHANGE IN OPTICAL TRANSMITTANCE	-	1-46	20	-
	IMMUNITY TO AMBIENT LIGHT COUPLING	305	3-8	22	-
	NUMERICAL APERTURE	302	1-43	177	-

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3.2 Fiber Optic Cable (Simplex)

GENERAL	TEST REQUIREMENT	AS4373	EN 3745	IEC60793	MIL-STD-1678	TIA-455	OTHER
	CONTRAST MEASUREMENT	1001	705	-	-	-	-
	DURABILITY OF MANUFACTURERS MARKING	710	703	-	3104	-	-
	OUTER JACKET EXTERNAL DIAMETER	101	203	-	3101	-	-
	OUTER JACKET WALL THICKNESS	101	203	-	3101	-	-
	PRIMARY BUFFER/COATING DIAMETER	-	203	1-21	3101	48	-
	SECONDARY BUFFER/COATING DIAMETER	-	203	1-21	3101	48	-
	VISUAL EXAMINATION	-	201	-	3105	13	-

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Fiber Optic Cable (Simplex) (Continued)

MECHANICAL	TEST REQUIREMENT	AS4373	EN 3745	IEC60794	MIL-STD-1678	TIA-455	OTHER
	ACCELERATED AGING	807	401	1-2-F9	-	18	-
	BEND	-	510	1-2-E11	-	88	-
	BEND TWIST	-	514	-	-	91	-
	BUFFER INSERTION FORCE	-	515	-	-	-	-
	CABLE KINK	-	509	1-2-E10	-	-	-
	CABLE TIE CLAMPING	-	517	-	-	-	ARINC802-2.2.3.14
	CABLE TO CABLE ABRASION	701	511	-	-	66	ARINC802-2.2.3.11
	COLD BEND	702	406	-	-	-	-
	CRUSH RESISTANCE	-	513	1-2-E3	-	-	-
	CUT-THROUGH RESISTANCE	703	507	1-2-E12	-	-	-
	ELONGATION, INSULATION AND SHEATH	705	-	-	-	-	FED-STD-228-3031.1
	FLEXURE ENDURANCE	704	512	1-2-E8	-	104	Telcordia GR-1209-5.4.3.1
	IMPACT	-	506	-	-	2	-
	LONGITUDINAL STABILITY	104	205	-	-	86	ARINC802-2.2.3.10
	LOW/HIGH TEMPERATURE BEND	-	510	-	-	37	-
	MICRO-BENDING	-	504	-	-	-	-
	SCRAPE ABRASION	-	503	1-2-E2	3203	-	-
	SEVERE BEND (MACROBENDING)	-	516	-	-	62	-
	SHOT-GUN DAMAGE	-	-	1-2-E13	-	-	-
	SPRINGBACK	707	-	-	-	-	-
	STIFFNESS/FLEXIBILITY	707	-	-	-	-	ARINC802-2.2.3.1
STRIPPABILITY (JACKETS AND BUFFERS)	103	701	1-2-E5	-	-	-	
TENSILE STRENGTH	-	505	1-2-E1	-	-	Telcordia GR-1209-5.4.3.4	
TENSILE STRENGTH, INSULATION AND SHEATH	705	-	-	-	-	FED-STD-228-3021	
THERMAL CYCLING (WITH MANDREL)	-	301	-	-	-	-	
THERMAL LIFE	-	410	-	3303	4	-	
TORSION (TWIST)	-	508	1-2-E7	-	85	Telcordia GR-1209-5.4.3.2	
TUBE KINK	-	509	1-2-E10	-	-	-	

Fiber Optic Cable (Simplex) (Continued)

ENVIRONMENTAL	TEST REQUIREMENT	AS4373	EN 3745	IEC60794	MIL-STD-1678	TIA-455	OTHER
	COLD TEMPERATURE, LOW PRESSURE, DAMP HEAT	-	-	-	-	-	-
	DAMP HEAT (CYCLIC TEST)/HUMIDITY RESISTANCE	603	412	-	3302	162	-
	ENDURANCE AT TEMPERATURE/THERMAL LIFE	814	410	-	-	4	-
	FIRE RESISTANCE	-	407	-	-	-	-
	FLAMMABILITY	801	407	-	3405/3406	-	DOT/FAA/AR-00/12
	FLUID RESISTANCE	601	411	1-2-F5	3409	12	-
	FREEZING WATER IMMERSION	-	-	-	3307	98	-
	HUMIDITY RESISTANCE	-	412	-	-	162	-
	MOLD GROWTH/FUNGUS RESISTANCE	-	-	-	3401	56	MIL-HDBK-454
	OUTGASSING	608	-	-	-	-	ASTM E1559-03 ² ASTM E595 ³
	OZONE RESISTANCE	-	-	-	3404	189	-
	RADIATION EXPOSURE	-	-	1-2-F7	-	64	NRL_MR_6505-92-693 ⁴ MIL-PRF-49291
	SMOKE DENSITY	-	601	-	3405	-	ARINC802-2.2.4.7-
	TEMPERATURE CYCLING	-	402	1-3-F1	3301	3	-
	THERMAL SHOCK (RAPID CHANGE OF TEMPERATURE)	-	404	-	3304	71	-
TOXICITY	-	602	-	3407	-	ARINC802-2.2.4.7-	

² ASTM E1559 - Standard Test Method for Contamination Outgassing Characteristics of Spacecraft Materials.

³ Standard Test Method For Total Mass Loss And Collected Volatile Condensable Materials From Outgassing In A Vacuum Environment.

⁴ NRL_MR_6505-92-693, Naval Research Laboratories Radiation Testing of Fiber Optic Passive Components.

OPTICAL	TEST REQUIREMENT	EN 3745	IEC60793	TIA-455	OTHER
	ATTENUATION - MULTIMODE	301	1-40	78	-
	ATTENUATION - SINGLEMODE	301	-	78	-
	ATTENUATION DURING TEMPERATURE CYCLING	301	-	-	-
	BANDWIDTH	303	-	-	-
	CHANGE IN OPTICAL TRANSMITTANCE	-	1-46	20	-
	IMMUNITY TO AMBIENT LIGHT COUPLING	305	-	22	-
	NUMERICAL APERTURE	302	-	-	-
	VISUAL EXAMINATION	201	-	13	-

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3.3 Fiber Optic Cable (Ribbon)

GENERAL	TEST REQUIREMENT	EN 3745	IEC60794	TIA-455	OTHER
	RIBBON DIMENSIONS AND GEOMETRY - VISUAL	-	1-2-G2	123	-
	RIBBON DIMENSIONS - APERTURE GAUGE	-	1-2-G3	-	-
	RIBBON DIMENSIONS - DIAL GAUGE	-	1-2-G4	-	-
	PRIMARY BUFFER/COATING DIAMETER	203	-	-	-
	SECONDARY BUFFER/COATING DIAMETER	203	-	-	-
	VISUAL EXAMINATION	201	-	13	-

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Fiber Optic Cable (Ribbon) (Continued)

MECHANICAL	TEST REQUIREMENT	EN 3745	IEC60794	MIL-STD-1678	TIA-455	OTHER
	ACCELERATED AGING	401	-	3303	-	-
	BEND	510	1-2-G1	-	-	-
	BEND TWIST	514	-	-	91	-
	BUFFER INSERTION FORCE	515	-	-	-	-
	CABLE KINK	509	-	-	-	-
	CABLE STRIPPING	701	-	-	-	-
	CABLE TIE CLAMPING	517	-	-	-	-
	CABLE TO CABLE ABRASION	511	-	-	-	-
	COLD BEND	406	-	-	-	-
	CONTRAST MEASUREMENT	705	-	-	-	-
	CRUSH RESISTANCE	513	-	-	-	-
	CUT-THROUGH	507	-	-	-	-
	DURABILITY OF MANUFACTURERS MARKINGS	703	-	-	-	-
	ELONGATION, INSULATION AND SHEATH	-	-	-	-	AS4373 Test method 705 FED-STD-228-3031.1 ASTM D470
	FLEXURE ENDURANCE	512	-	-	-	Telcordia GR-1209-5.4.3.1
	IMPACT	506	-	-	25	-
	LONGITUDINAL STABILITY	205	-	-	-	-
	LOW/HIGH TEMPERATURE BEND	405	-	-	-	-
	MICRO-BENDING	504	-	-	-	-
RESIDUAL TWIST	-	-	-	131	-	
SCRAPE ABRASION	503	-	3203	-	-	
SEVERE BEND (MACRO-BEND)	516	-	-	-	-	

Fiber Optic Cable (Ribbon) (Continued)

MECHANICAL	TEST REQUIREMENT	EN 3745	IEC60794	MIL-STD-1678	TIA-455	OTHER
	TENSILE STRENGTH	505	-	-	-	Telcordia GR-1209-5.4.3.4
	TENSILE STRENGTH, INSULATION AND SHEATH	-	-	-	-	AS4373 Test method 705 FED-STD-228-3021 ASTM D470
	THERMAL CYCLING (WITH MANDREL)	301	-	-	-	-
	THERMAL LIFE	410	-	-	-	-
	TORSION (TWIST)	508	1-2-G6	-	141	Telcordia GR-1209-5.4.3.2
	TUBE KINK	509	1-2-G7	-	-	-

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Fiber Optic Cable (Ribbon) (Continued)

ENVIRONMENTAL	TEST REQUIREMENT	EN 3745	IEC60794	MIL-STD-1678	TIA-455	OTHER
	COLD TEMPERATURE, LOW PRESSURE, DAMP HEAT	-	-	-	-	-
	DAMP HEAT (CYCLIC TEST)	-	-	3302	-	-
	ENDURANCE AT TEMPERATURE	-	-	-	-	-
	FIRE RESISTANCE	-	-	-	-	-
	FLAMMABILITY	407	-	-	-	DOT/FAA/AR-00/12
	FLUID RESISTANCE	-	-	-	12	-
	HUMIDITY RESISTANCE	412	-	-	-	-
	IMMUNITY TO AMBIENT LIGHT COUPLING	305	-	-	-	-
	MOLD GROWTH/FUNGUS RESISTANCE	-	-	-	56	-
	RADIATION EXPOSURE	603	-	-	64	NRL_MR_6505-92-693 ³
	OZONE RESISTANCE	-	-	-	-	-
	RESISTANCE TO FLUIDS	411	-	-	-	-
	SMOKE DENSITY	601	-	-	-	-
	TEMPERATURE CYCLING	402	-	3301	3	-
THERMAL SHOCK (RAPID CHANGE OF TEMPERATURE)	404	-	3304	71	-	
TOXICITY	602	-	-	-	-	

OPTICAL	TEST REQUIREMENT	EN 3745	IEC60793	MIL-STD-1678	TIA-455	OTHER
	ATTENUATION - MULTIMODE	301	-	-	78	-
	ATTENUATION - SINGLEMODE	-	-	-	78	-
	ATTENUATION DURING TEMPERATURE CYCLING	301	-	-	-	-
	BANDWIDTH	-	-	-	-	-
	CHANGE IN OPTICAL TRANSMITTANCE	-	1-46	-	20	-
	CLADDING DIAMETER	-	-	-	-	-
	CORE DIAMETER	-	-	-	-	-
	CORE NON-CONCENTRICITY	-	-	-	-	-
	CORE/CLADDING CONCENTRICITY ERROR	-	-	-	-	-
	FIBER PROOF TEST	-	-	-	-	-
	NUMERICAL APERTURE	-	-	-	-	-
TENSILE STRENGTH	-	-	-	-	-	
VISUAL EXAMINATION	-	-	-	-	-	

4. CONNECTORS CIRCULAR

MIL-PRF-28876 Military Specification: Connectors, Fiber Optic, Circular, Plug and Receptacle Style, Multiple Removable Termini, General Specification For (Naval applications) refer to TIA-455, Standard Test Procedure for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices, and Other Fiber Optic Components.

NOTE: Unpopulated test requirements have been identified as a requirement, but no test method has been identified.

MECHANICAL	TEST REQUIREMENT	EN 2591	IEC61300	MIL-STD-1678	TIA-455	EIA-364	OTHER
	ACCELERATION STEADY STATE	6401	2-13	-	18	1	-
	AXIAL LOAD	6405	-	-	-	-	-
	TERMINUS RETENTION	409	-	-	-	29	-
	TERMINUS INSERTION AND EXTRACTION FORCES	412	3-33	-	-	5	-
	TERMINUS WALKOUT	-	-	-	-	-	ARINC801
	CRUSH RESISTANCE/RADIAL COMPRESSION	614	2-10	-	26	40	-
	DURABILITY OF TERMINUS RETENTION SYSTEMS AND SEALS (MAINTENANCE AGING)	407	-	-	17	24	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE AXIAL COMPRESSION)	612	2-11	-	-	-	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE CYCLIC FLEXING)	609	2-35	-	-	41	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE PULL)	610	2-4	-	-	38	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE TORSION)	611	2-5	-	6	-	-
	EXAMINATION OF DIMENSIONS AND MASS	102	-	-	-	18	-
	FERRULE COMPRESSION FORCE	-	3-22	-	-	-	-
	FERRULE WITHDRAWAL FORCE	-	3-33	-	-	-	-
	IMPACT	613	2-8	-	-	42	Telcordia GR-1209-5.4.1.3
	INSERT RETENTION (AXIAL)	410	-	-	-	35	-
	INSERT RETENTION (TORSIONAL)	411	-	-	36	19	-
	INTERFACIAL SEALING	6324	-	-	-	-	-
	MATING/UNMATING FORCES (CONNECTOR COUPLING FORCES)	408	3-11	-	187	13	-
MECHANICAL ENDURANCE (MATING CYCLES)	6406	2-2	-	-	-	-	
SHOCK	6402	2-9	3202	-	27	-	

Connectors Circular (Continued)

TEST PROBE DAMAGE	6415	-	-	-	-	-
TRANSVERSE LOAD	6404	2-7	-	-	-	-
UNMATING OF LANYARD RELEASE (OPTICAL CONNECTION)	6414	-	-	-	-	-
VIBRATION	6403	2-1	3201 ⁵	11	28	Telcordia GR-1209-5.4.1.2
VISUAL INSPECTION	6101	3-1	3105	-	18	-

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⁵ MIL-STD-1678, Measurement 3201 Vibration.

This measurement is intended to be used as part of qualification testing and is intended to supplement the applicable military standard (such as MIL-STD-167), commercial standard (such as TIA/EIA-455-11) or military specification (such as MIL-DTL-38999) for performing mechanical vibration testing on fiber optic components as specified in the applicable component military specification using a vibration machine that generates sinusoidal and random vibration environments. Further refinements or boundaries (constraints) are imposed in this measurement. To ensure that the risk to the government of accepting bad optical measurement data is low, to minimize test variations, and to permit more accurate comparison of test results from multiple sources, a "standardized" approach is specified to perform this measurement.

NOTE: MIL-STD-167, Mechanical Vibrations of Shipboard Equipment (Type I-Environmental and Type II-Internally Excited).

Connectors Circular (Continued)

ENVIRONMENTAL	TEST REQUIREMENT	EN 2591	IEC61300	MIL-STD-1678	TIA-455	EIA-364	OTHER
	AIR LEAKAGE	312	-	-	-	36	-
	CLIMATIC SEQUENCE/TEMPERATURE CYCLING	302	2-22	3301	-	32/110	-
	COLD TEMPERATURE, LOW PRESSURE, DAMP HEAT	6303	-	-	188	59	-
	DAMP HEAT (CYCLIC)	6321	2-46	3302	-	-	Telcordia GR-1209-5.4.2.2
	DAMP HEAT (STEADY STATE)/HUMIDITY	304	2-19	-	-	5	Telcordia GR-1209-5.4.2.1
	DRIVING RAIN (ARTIFICIAL)	313	-	-	-	-	-
	DRY HEAT	309	2-18	-	-	-	-
	ENDURANCE AT TEMPERATURE/THERMAL LIFE/THERMAL AGING	-	2-18	3303	-	17	Telcordia GR-1209-5.4.1.1
	FIRE RESISTANCE	318	-	-	172	45	-
	FLAMMABILITY	6317	2-36	3406	-	45	-
	FLUID RESISTANCE/FLUID IMMERSION	6315	2-34	3409	-	10	DOT/FAA/AR-00/12
	HERMETICITY	322	-	-	-	-	-
	ICE RESISTANCE (FREEZING)	325	-	3307	-	-	-
	IMMERSION AT LOW AIR PRESSURE (ALTITUDE IMMERSION)	6314	2-29	-	190	105	-
	MOLD GROWTH (FUNGUS RESISTANCE)	6306	2-16	3401	-	-	-
	OZONE RESISTANCE	6316	-	3404	189	-	-
	RADIATION EXPOSURE	-	-	-	-	64	-
	RAPID CHANGE OF TEMPERATURE (THERMAL SHOCK)	6305	2-47	-	71	-	-
	SALT SPRAY/SALT MIST	307	2-26	3402	-	26	-
SAND AND DUST	308	2-27	-	35	50	-	
SHIELDING EFFECTIVENESS	-	-	3308	-	-	-	
SOLAR RADIATION	320	2-30	-	-	-	-	
TEMPERATURE CYCLING	617	2-22	3301	3	32	Telcordia GR-1209-5.4.1.5	
THERMAL SHOCK	-	2-22	3304	-	-	-	
THERMAL SHOCK (HERMETIC COMPONENTS)	6323	-	-	71	-	-	

Connectors Circular (Continued)

OPTICAL	TEST REQUIREMENT	EN 2591	IEC61300	TIA-455	OTHER
	CHANGE OF POWER DISTRIBUTION	603	-	-	-
	CLEANING CAPABILITY OF OPTICAL END FACE	604	-	-	ARP6283 -
	CONNECTION INTEGRITY AT TEMPERATURE	-	-	-	-
	OPTICAL CROSSTALK (FAR END)	606	3-9	42	-
	IMMUNITY TO AMBIENT LIGHT COUPLING	607	3-8	-	-
	INSERTION LOSS	601	-	34	-
	RETURN LOSS	605	3-6	107	-
	VARIATION OF ATTENUATION AND OPTICAL DISCONTINUITY (CHANGE IN OPTICAL TRANSMITTANCE)	602	3-28 ⁶	20	-

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⁶ EN 61300 Test method 3-28, Transient Loss limited to a maximum transient loss (optical discontinuity) of 1 ms.

5. CONNECTORS RECTANGULAR

NOTE: Unpopulated test requirements have been identified as a requirement, but no test method has been identified.

MECHANICAL	TEST REQUIREMENT	EN 2591	IEC61300	MIL-STD-1678	TIA-455	EIA-364	OTHER
	ACCELERATION STEADY STATE	6401	2-13	-	-	01	-
	AXIAL LOAD	6405	-	-	-	-	-
	TERMINUS RETENTION	409	-	-	-	29	-
	TERMINUS INSERTION AND EXTRACTION FORCES	412	3-33	-	-	-	-
	TERMINUS WALKOUT	-	-	-	-	-	ARINC801 ⁴
	CRUSH RESISTANCE	-	2-10	-	-	-	-
	DURABILITY OF TERMINUS RETENTION SYSTEMS AND SEALS (MAINTENANCE AGING)	407	-	-	-	-	Telcordia GR-1209-5.4.1.1
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE AXIAL COMPRESSION)	612	2-11	-	-	-	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE CYCLIC FLEXING)	609	2-35	-	-	-	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE PULL)	610	2-4	-	-	-	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE TORSION)	611	2-5	-	-	-	-
	EXAMINATION OF DIMENSIONS AND MASS	102	-	-	-	-	-
	IMPACT	613	2-8	-	-	42	Telcordia GR-1209-5.4.1.3
	INSERT RETENTION (AXIAL)	410	-	-	-	35	-
	INSERT RETENTION (TORSIONAL)	411	-	-	-	-	-
	INTERFACIAL SEALING	6324	-	-	-	-	-
	MATING DURABILITY	406	2-2	-	-	-	-
	MATING/UNMATING FORCES (COUPLING FORCES)	408	3-11	-	-	13	-
	MECHANICAL ENDURANCE (MATING CYCLES)	6406	2-2	-	-	-	-
SHOCK	6402	2-9	3202	-	-	-	
TEST PROBE DAMAGE	6415	-	-	-	-	-	
TRANSVERSE LOAD	6404	2-7	-	-	-	-	
UNMATING OF LANYARD RELEASE (OPTICAL CONNECTION)	6414	-	-	-	-	-	
VIBRATION	6403	2-1	3201 ³	11	-	Telcordia GR-1209-5.4.1.2	
VISUAL INSPECTION	6101	3-1	3105	-	18	-	

Connectors Rectangular (Continued)

ENVIRONMENTAL	TEST REQUIREMENT	EN 2591	IEC61300	MIL-STD-1678	TIA-455	EIA-364	OTHER
	AIR LEAKAGE	312	-	-	-	36	-
	CLIMATIC SEQUENCE/TEMPERATURE CYCLING	302	2-22	3301	-	-	-
	COLD TEMPERATURE, LOW PRESSURE, DAMP HEAT	6303	-	-	-	59	-
	DAMP HEAT (CYCLIC)	6321	2-46	3302	-	-	Telcordia GR-1209-5.4.2.2
	DAMP HEAT (STEADY STATE)/HUMIDITY	304	2-19	-	5	-	Telcordia GR-1209-5.4.2.1
	DRIVING RAIN (ARTIFICIAL)	313	-	-	-	-	-
	DRY HEAT	309	2-18	-	-	-	-
	ENDURANCE AT TEMPERATURE/THERMAL LIFE/THERMAL AGING	-	2-18	3303	-	17	Telcordia GR-1209-5.4.1.1
	FIRE RESISTANCE	318	-	-	-	45	-
	FLAMMABILITY	6317	2-36	3406	-	45	DOT/FAA/AR-00/12
	FLUID RESISTANCE/FLUID IMMERSION	6315	2-34	3409	-	10	-
	IMMERSION AT LOW AIR PRESSURE (ALTITUDE IMMERSION)	6314	2-29	-	15	105	-
	LOW AIR PRESSURE	311	-	-	-	105	-
	MOLD GROWTH	6306	2-16	3401	-	-	-
	OZONE RESISTANCE	6316	-	3404	-	-	-
	RADIATION EXPOSURE	-	-	-	64	-	-
	RAPID CHANGE OF TEMPERATURE (THERMAL SHOCK)	6305	2-47	-	71	-	-
	SALT SPRAY/SALT MIST	307	2-26	3402	-	26	-
	SAND AND DUST	308	2-27	-	-	50	-
SHIELDING EFFECTIVENESS	-	-	3308	-	-	-	
SOLAR RADIATION	320	2-30	-	-	-	-	
TEMPERATURE CYCLING	617	2-22	3301	-	110	Telcordia GR-1209-5.4.1.5	

Connectors Rectangular (Continued)

OPTICAL	TEST REQUIREMENT	EN 2591	IEC61300	TIA-455	OTHER
	CHANGE OF POWER DISTRIBUTION	603	-	-	-
	CLEANING CAPABILITY OF OPTICAL END FACE	604	-	-	ARP6283
	CONNECTION INTEGRITY AT TEMPERATURE	-	-	-	-
	OPTICAL CROSSTALK (FAR END)	606	3-9	42	-
	IMMUNITY TO AMBIENT LIGHT COUPLING	607	3-8		-
	INSERTION LOSS	601	-	34	-
	RETURN LOSS	605	3-6	107	-
VARIATION OF ATTENUATION AND OPTICAL DISCONTINUITY (CHANGE IN OPTICAL TRANSMITTANCE)	602	3-28 ⁵	20	-	

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6. FIBER OPTIC TERMINUS

6.1 Physical Contact

The test methods detailed in the following tables take into account that the test sample being used for the qualification process is made up of a physical contact (PC) fiber optic terminus terminated to a suitable fiber optic cable or buffered optical fiber. Test methods designed for only the fiber optic terminus are detailed in AS6250 and respective slant sheets. The terminus is qualified as a part of a complete connector assembly when tested in accordance with the recognized product standard slant sheet.

MIL-PRF-29504 Performance Specification Termini, Fiber Optic Connector, Removable, General Specification for refer to TIA-455, Standard Test Procedure for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices, and Other Fiber Optic Components.

NOTE: Unpopulated test requirements have been identified as a requirement, but no test method has been identified.

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MECHANICAL	TEST REQUIREMENT	EN 2591	IEC61300	TIA-455	EIA-364	OTHER
	ANGULAR MISALIGNMENT BETWEEN FIBER AND FERRULE AXES	-	3-26	-	-	-
	AXIAL LOAD	405	-	-	-	-
	BENDING MOMENT	-	2-7	-	-	-
	CIRCULAR RUNOUT	-	-	135	-	-
	CONCENTRICITY OF FERRULE AND FERRULES WITH INSTALLED FIBER	-	3-25	-	-	-
	CRUSH RESISTANCE	-	2-10	-	-	-
	DOVE ECCENTRICITY OF CONVEX POLISHED FERRULE END FACE	-	3-15	-	-	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE AXIAL COMPRESSION)	612	2-11	-	-	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE CYCLIC FLEXING)	609	-	-	-	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE PULL)	610	2-4	-	38	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE TORSION)	611	-	-	6	-
	END FACE ANGLE OF APC POLISHED FERRULE	-	3-17	-	-	-
	END FACE RADIUS OF SPHERICALLY POLISHED FERRULE	-	3-16	-	-	-
	EXAMINATION OF DIMENSIONS AND MASS	102	-	-	18	-
	FERRULE INSIDE AND OUTSIDE DIAMETER DIMENSIONS	-	3-36	-	-	-
	FIBER POSITION RELATIVE TO FERRULE ENDFACE	-	3-23	-	-	-
	IMPACT	613	-	-	-	-
	TERMINUS INSERTION AND REMOVAL FORCES (RUNNING FORCE)	-	3-33 ⁷	-	37	-

⁷ EN 61300-3-33 measures the withdrawal force of the ferrule from the alignment mechanism only.

Physical Contact (Continued)

ENVIRONMENTAL	TEST REQUIREMENT	EN 2591	IEC61300	MIL-STD-1678	TIA-455	EIA-364	OTHER
	DAMP HEAT (CYCLIC)	6321	2-46	-	5	-	-
	ICE RESISTANCE (FREEZING WATER)	-	-	-	-	-	-
	IMMERSION AT LOW AIR PRESSURE (ALTITUDE IMMERSION)	6314	2-29	-	15	-	-
	OZONE RESISTANCE	6316	-	3404	189	-	-
	RADIATION EXPOSURE	-	-	-	64	-	-
	RAPID CHANGE OF TEMPERATURE (THERMAL SHOCK)	6305	-	-	71	-	-
	SALT SPRAY/SALT MIST	6307	2-26	3402	-	26	-
	SALT SPRAY (UNMATED TERMINUS END FACE)	-	-	-	-	-	-
	TEMPERATURE CYCLING	617	2-22	3301	-	110	-
	THERMAL AGING	-	2-18	3303	-	17	Telcordia GR-1209-5.4.1.1

OPTICAL	TEST REQUIREMENT	EN 2591	IEC61300	TIA-455	OTHER
	CLEANING CAPABILITY OF OPTICAL END FACE	604	-	-	ARP6283/3
	CHANGE IN POWER DISTRIBUTION	603	-	-	-
	ENDURANCE AT TEMPERATURE	6301	-	-	-
	IMMUNITY TO AMBIENT LIGHT COUPLING	607	3-8	22	-
	INSERTION LOSS	601	3-4	34	-
	RAPID CHANGE OF TEMPERATURE (THERMAL SHOCK)	6305	-	71	-
	RETURN LOSS	605	3-6	107	-
	VARIATION OF ATTENUATION AND OPTICAL DISCONTINUITY	602	3-28 ⁵	32	-

6.2 Expanded Beam

The test methods detailed in the following tables take into account that the test sample being used for the qualification process is made up of an expanded beam (EB) fiber optic terminus terminated to a suitable fiber optic cable or buffered optical fiber. Test methods designed for only the fiber optic terminus are detailed in AS6250 and respective slant sheets.

The terminus is qualified as a part of a complete connector assembly when tested in accordance with the recognized product standard slant sheet.

MIL-PRF-29504 Performance Specification Termini, Fiber Optic Connector, Removable, General Specification for refer to TIA-455, Standard Test Procedure for Fiber Optic Fibers, Cables, Transducers, Sensors, Connecting and Terminating Devices, and Other Fiber Optic Components.

NOTE: Unpopulated test requirements have been identified as a requirement, but no test method has been identified.

MECHANICAL	TEST REQUIREMENT	EN 2591	IEC61300	TIA-455	EIA-364	OTHER
	DURABILITY OF TERMINUS RETENTION SYSTEMS AND SEALS (MAINTENANCE AGING)	407	-	-	17	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE PULL)	610	2-4	-	38	-
	FERRULE WITHDRAWAL FORCE	-	3-33	-	-	-
	INSERTION LOSS	601				-
	SHOCK	6402	2-9	3202	-	27
	TERMINUS MATE/UNMATE FORCES	-	-	-	05B	-
	VIBRATION	6403	-	-	2-1	3201 ³
	VISUAL INSPECTION	6101	3-1	3105	-	18

ENVIRONMENTAL	TEST REQUIREMENT	EN 2591	IEC61300	MIL-STD-1678	TIA-455	EIA-364	OTHER
	DAMP HEAT (CYCLIC)	6321	2-46	-	5	-	-
	IMMERSION AT LOW AIR PRESSURE (ALTITUDE IMMERSION)	6314	2-29	-	15	-	-
	TEMPERATURE CYCLING	617	2-22	3301	-	110	-

Expanded Beam Terminus (Continued)

OPTICAL	TEST REQUIREMENT	EN 2591	IEC61300	TIA-455	OTHER
	CLEANING CAPABILITY OF OPTICAL END FACE	604	-	-	ARP6283
	CHANGE IN POWER DISTRIBUTION	603	-	-	-
	ENDURANCE AT TEMPERATURE	6301	-	-	-
	IMMUNITY TO AMBIENT LIGHT COUPLING	607	3-8	22	-
	INSERTION LOSS	601	3-4	34	-
	RETURN LOSS	605	3-6	107	-
	VARIATION OF ATTENUATION AND OPTICAL DISCONTINUITY	602	3-28 ⁵	32	-

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7. MULTI-FIBER TERMINUS

The test methods detailed in the following tables take into account that the test sample being used for the qualification process is made up of a multi-fiber optic terminus terminated to suitable fiber optic cables or buffered optical fibers. Test methods designed for only the fiber optic terminus are detailed in AS6250 and respective slant sheets. The terminus is qualified as a part of a complete connector assembly when tested in accordance with the recognized product standard slant sheet.

NOTE: Unpopulated test requirements have been identified as a requirement, but no test method has been identified.

MECHANICAL	TEST REQUIREMENT	EN 2591	IEC61300	EIA-364	TELCORDIA GR-1435	OTHER
	ANGULAR MISALIGNMENT BETWEEN FIBER AND FERRULE AXES	-	3-26	-	-	-
	AXIAL LOAD	405	-	-	-	-
	BENDING MOMENT	-	2-7	-	-	Telcordia GR-1435 ⁸
	TERMINUS WALKOUT	-	-	-	-	ARINC801 ⁴
	CRUSH RESISTANCE	-	2-10	-	-	-
	DOME ECCENTRICITY OF CONVEX POLISHED FERRULE END FACE	-	3-15	-	-	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE AXIAL COMPRESSION)	612	2-11	-	-	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE CYCLIC FLEXING)	609	-	-	4.6.2.6.1	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE PULL)	610	2-4	38	4.6.2.6	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE TORSION)	611	-	6	4.6.2.4	-
	EFFECTIVENESS OF CABLE ATTACHMENT (CABLE TWIST)	-	-	-	4.6.2.6.2	-
	END FACE ANGLE OF APC POLISHED FERRULE	-	3-17	-	-	-
	EXAMINATION OF DIMENSIONS AND MASS	102	-	18	-	-
	FERRULE INSIDE AND OUTSIDE DIAMETER DIMENSIONS	-	3-36	-	-	-
FIBER POSITION RELATIVE TO FERRULE END FACE	-	3-23	-	-	-	

⁸ Telcordia GR-1435 - Generic Requirements for Multi-Fiber Optical Connectors.

Multi-Fiber Terminus Mechanical (Continued)

MECHANICAL	TEST REQUIREMENT	EN 2591	IEC61300	TIA-455	EIA-364	TELCORDIA GR-1435	OTHER
	IMPACT	613	2-8	2	-	4.6.3	-
	INTERMATEABILITY	-	-	-	-	3.5	TIA-1604-12 ⁹
	MATING DURABILITY	406	2-2	21	-	4.6.4	-
	MULTI-FIBER TERMINUS HOLE LOCATION ACCURACY	-	3-27	-	-	-	-
	POLISH ANGLE AND FIBER POSITION	-	3-30	-	-	-	-
	TERMINUS INSERTION AND REMOVAL FORCES (RUNNING FORCE)	-	3-33 ¹⁰	-	37	-	-
	VIBRATION	-	-	11	-	-	-

ENVIRONMENTAL	TEST REQUIREMENT	EN 2591	IEC61300	MIL-STD-1678	TIA-455	EIA-364	TELCORDIA GR-1435	OTHER
	DAMP HEAT (CYCLIC)	6321	2-46	-	3	-	-	-
	FLAMMABILITY	-	-	-	-	-	3.3.2.3	-
	ENDURANCE AT TEMPERATURE/THERMAL LIFE/THERMAL AGING	-	2-18	3303	-	17	-	Telcordia GR-1209-5.4.1.1
	DAMP HEAT (STEADY STATE)/HUMIDITY	-	-	-	5	-	-	-
	END FACE ICE RESISTANCE (FREEZING WATER)	-	-	-	-	-	-	-
	IMMERSION AT LOW AIR PRESSURE (ALTITUDE IMMERSION)	6314	2-29	-	15	-	-	-
	MOLD GROWTH	-	-	-	-	-	3.3.2.2	ASTM G21 ¹¹
	TEMPERATURE CYCLING	617	2-22	3301	3	110	-	-
	THERMAL AGING	-	2-18	3303	4	17	-	-

⁹ TIA-1604-12, - Fiber Optic Connector Intermateability Standard, Type MT-RJ.

¹⁰ EN 61300-3-33 measures the withdrawal force of the ferrule from the alignment mechanism only.

¹¹ ASTM G21, Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.