TORONTECH

OPTICAL FIBER CABLE TENSILE TESTING MACHINE - OUTDOOR CABLE

IEC-60794-1 Method E1, EN 187000 method 501, EIA/TIA-455 no. 33

Torontech's TT-OFCT-OD Optical Fiber Cable Tensile Testing Machine - Outdoor Cable is designed in accordance to IEC-60794-1 Method E1 for tensile testing of outdoor Optical Fiber Cables, this measuring method applies to optical fiber cables which are tested at a particular tensile strength in order to examine the behavior of the attenuation and/or the fiber

Elongation strain as a function of the load on a cable which may occur during installation. This method is intended to be non-destructive (the tension applied shall be within the operational values).

APPLICATIONS

- **elecommunication Networks** – Tests outdoor fiber cables under tensile load to ensure stable attenuation during installation.
- **Long-Distance and Underground Cables** – Confirms strength and elongation performance for cables exposed to pulling forces over extended runs.
- **Elevator and Lift Cables** – Validates tensile behavior under vertical installation stresses.
- **Industrial and Utility Installations** – Ensures durability of cables subjected to mechanical tension in harsh environments.
- **Automotive, Rail, and Transport Systems** – Evaluates tensile reliability of fiber optic cables in dynamic or constrained routing.
- **Aerospace and Defense Applications** – Certifies high-strength cables where tensile stability and signal integrity are critical.
- **Quality Control and Certification** – Provides IEC 60794-1 Method E1, EN 187000, and EIA/TIA-455-33 compliance for manufacturers and testing laboratories.

THEORY & METHOD

The cable length under test is 150 meters, Additional cable length is needed to connect the fibers to be tester. The apparatus consists of an attenuation measuring apparatus, typically an OTDR supplied by customer. A fiber elongation strain measuring apparatus based on dispersion testing equipment. A specially designed tensile test machine capable of tensioning 150 meters of optical cable in six legs of 25 meters each. The machine is equipped with a motor for controlled tensioning and a load cell for measuring the actual tension applied on the cable.

Cable is wound in the machine over appropriately sized sheaves. The cable ends extend to reach the measuring instruments. A pre-determined number of fibers within the cable are concatenated by fusion splicing. Typically, two sets of fibers are used, one will serve to measure attenuation change and the other serves for elongation monitoring.

After all initial measurements and calibration are carried out, the cable is pulled at a specified rate until a pre-attenuation and fiber length are measured.

This process may involve several tensile levels in order to characterize the entire tensile behavior of the cable, or be carried out only at the defined maximum allowed tension level.

Successful quality is tested when fiber cable is under load the fiber attenuation is not increased more than a predetermined value, typically 0.05dB over fiber length measured, and fiber cable is elongated more than a pre-determined value over its initial length. The allowed elongation under installation load is typically 0.25%

TECHNICAL SPECIFICATIONS

Model	TT-OFCT-OD	
Load capacity	100KN (other loads are available upon request)	
Accuracy class	±0.5% - ISO 7500-1	
Crosshead travel	80 - 1100 mm	
Loading speed	0.2 - 300 mm/min	

Accuracy					
Load measurement accuracy	±0.5% of reading to 1/100 of load weighing system capacity meets or exceeds the ISO 7500-1				
Strain measurement accuracy:	±0.5% of reading to 1/50 of full scale with most ASTM E83 class B or ISO 9513 class 0.5 extensometers meets or exceeds ASTM E83, ISO 9513, and EN 10002-4.				
Speed accuracy:	Set speed <0.05% Max. speed: ±1% Set speed ≥0.05% Max. speed:±0.5%				
Position measurement accuracy:	±0.01% of reading or 0.0001 mm, whichever is greater				
Deformation measuring accuracy	±0.5%				
Displacement measuring accuracy	±0.5%				
Optional LVDT type extensometer	1. Gauge length 1000mm 2. Measuring resolution is better than 10Î¼m 3. Accuracy is better than Â±0.5%.				
Power supply	Please specify voltage and frequency before placing the order. Power must be free of spikes and surges exceeding 10% of the nominal voltage)				
Operating temperature	0 to +38°C (+32 to +100°F)				
Humidity range	10% to 90% non-condensing				
Storage temperature	-40 to +66°C (-40 to +150°F)				
Operational space (WxDxH)	(Flexible) x 2000 x 1100				
Dimension/Weight	Machine		Shipping Package		
	Dimensions (LxWxH) mm	Net Weight Kg	Dimensions (LxWxH) mm	Gross Weight Kg	
Load frame	2700 x 1200 x 680	1200	2450 x 1060 x 960	1300	
Moveable pulley	2010 x 420 x 1100	200	2180 x 710 x 1330	250	
Fixed pulley	1100 x 800 x 1100	500	1200 x 960 x 1330	550	

Other Parts	2000 x 1000 x 1100	200	2100 x 960 x 1300	250	
PC + Table	800 x 800 x 900	50	900 x 1100 x 1300	70	

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