

GLY Series Optical Fiber Cable Tensile & Crush Testing Machine



The picture is for reference only

These machines offer force, displacement or deformation closed loop testing. The load frames are rigid constructed, providing superior axial and lateral stiffness.

Method E1: Tensile performance

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).

Method E3: Crush

The purpose of this test is to determine the ability of an optical fiber cable to withstand crushing.

Applications
Tensile performance Per IEC-60794-1-2 Method E1
Object
This measuring method applies to optical fiber cables, which are tested at particular tensile strength in order to examine the behavior of the attenuation and the fiber elongation strain as a function of the load on a cable, which may occur during installation and/or operation
Sample
The cable length under test is 150 meters, Additional cable length is needed to connect the fibers to be tested
Apparatus
The apparatus consists of
An attenuation measuring apparatus, typically an OTDR
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.

Procedure

The 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-determined tension is applied. The cable is laid to rest under tension as per detail specifications, and then the 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.

Pass/Fail criteria

1. Under load, the fiber attenuation is not increased more than a predetermined value, typically 0.05dB over fiber length measured
2. Under load, the fiber does elongation by more than a pre-determined value over its initial length. The allowed elongation under installation load is typically 0.25%

Crush(Compression)per IEC-60794-1-2 Method E3



Object

The purpose of this test is to determine the ability of an optical fiber cable to withstand compression

Sample

The sample is a representative cable length sufficient to carry out the specified test

Apparatus

The apparatus allows a sample of cable to be crushed between a flat steel base plate and a moveable 100 mm long steel plate. The edges of the moveable plate are rounded with a radius of about 5 mm.

Procedure

The cable sample is mounted between the plates so that lateral movement is prevented, and a pre-determined force is applied gradually. The maximum applied force is typically maintained for 10 minutes.

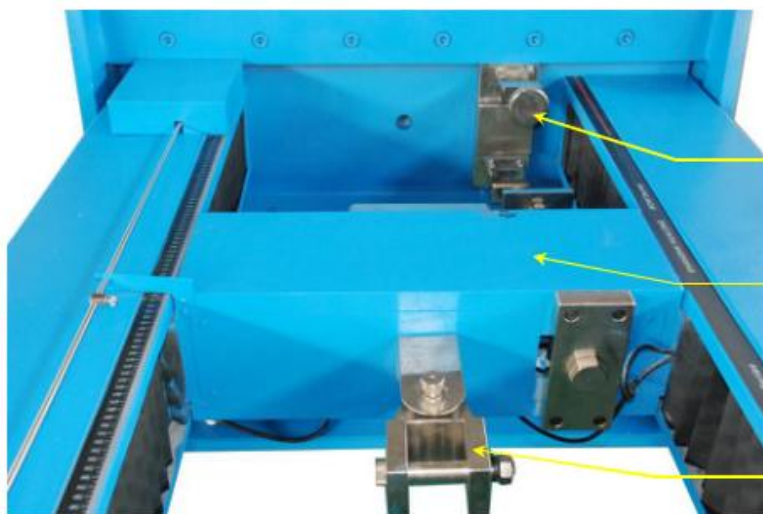
Two types of measurements may be defined

The fiber attenuation is measured at the end of the 10-minute period while the cable is still under pressure

The fiber attenuation is measured 5 minutes after pressure. This requirement is usually carried out at higher compressive loads than the previously described measurement.

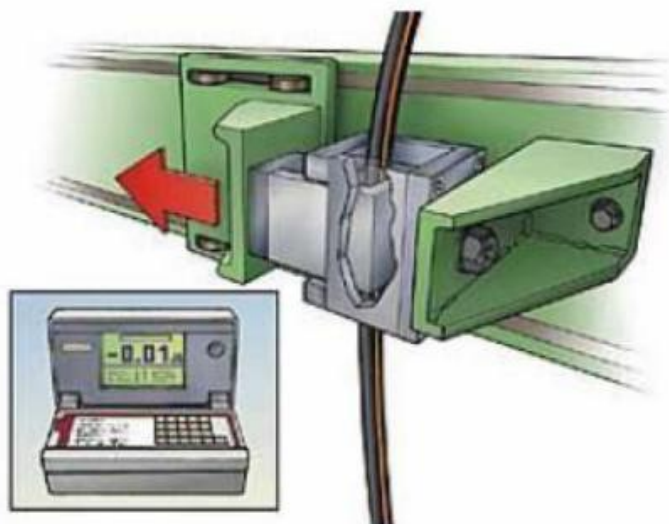
Pass/Fail criteria

1. The attenuation must not change by more than pre-determined value, typically 0.05dB.
2. In all cases, the cable elements should not fracture or crack. Signs of compression are not considered as damage to the cable elements



Compression apparatus to achieve crush test

Double acting crosshead is easy to perform both tensile and crush tests in accordance with IEC 60794-1-2 (E1, E3)



Load frame

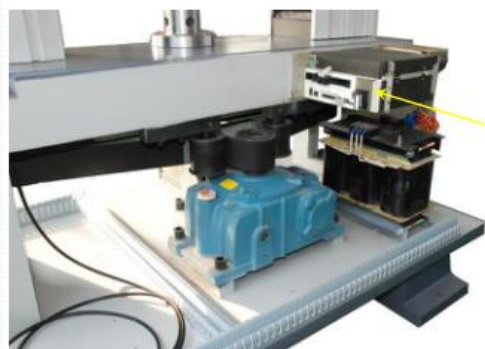
Stiff Frames

Pre-loaded bearings and precision ball screws, a thick crosshead and base beam, and low-stretch drive belts contribute to better performance by producing more accurate modulus and strain values and minimizing the energy stored during a test.



Servo-Controlled Drive System

Along with a powerful motor, the GLY drive system consists of a rugged steel casting with a dual-belt drive system. The dual-belt system provides synchronous movement of the ball screws, eliminating crosshead tilt and aiding system alignment.



GLY employs YASKAWA Servo driver and Servo motor. Which providing with 0.004 mm resolution for precise positioning of the crosshead.

Main specifications	
Load capacity:	100kN for tension, 10kN for crush test
Accuracy class:	±1%
Measuring range:	1%-100%
Crush platen:	100mm×100mm, hardness: HB240~280
loading speed:	0.2~300mm/min
Deformation measuring accuracy:	±0.5%
Displacement measuring accuracy:	±0.3%
Elongation measurement:	1. gauge length: 1000mm 2. Measuring resolution is better than 10μm 3. Accuracy is better than ±0.5%.
Crosshead travel:	800~1100mm
4. General Specifications	
5. Load Measurement Accuracy:	
6. ±1% of reading to 1/100 of load weighing system capacity meets or exceeds the requirements of the	

following standards: ISO 7500-1, EN 10002-2, ASTM E4, JIS B7721.

7. Strain Measurement Accuracy:

8. $\pm 0.5\%$ 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.

9. Speed Accuracy:

10. Set speed $< 0.05\%$ Max. speed: $\pm 1\%$ Set speed $\geq 0.05\%$ Max. speed: $\pm 0.5\%$

11. Position measurement accuracy:

12. $\pm 0.01\%$ of reading or 0.0001 mm, whichever is greater

13. Power supply:

14. Standard optional voltages 220/240VAC, 50-60 Hz, Power must be free of spikes and surges exceeding 10% of the nominal voltage.

15. Operating Temperature:

16. 0 to $+38^{\circ}\text{C}$ ($+32$ to $+100^{\circ}\text{F}$)

17. Humidity Range:

18. 10% to 90% non-condensing,

19. Storage Temperature:

20. -40 to $+66^{\circ}\text{C}$ (-40 to $+150^{\circ}\text{F}$)

21. Note:

22. Extra wide and/or extra height frames are available.

23. Power supply system is completely customizable.

24. Specifications are subject to change without notice.





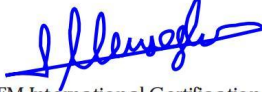
MACHINERY DIRECTIVE ATTESTATION OF CONFORMITY

Technical file of the company mentioned below has been inspected and audit has been completed successfully.

2006/42/EC Machinery Directive Annex VIII has been taken as references for these processes.

Company Name : **JINAN HENSGRAND INSTRUMENT CO., LTD.**
Company Address : NO.4915, WEST JINGSHI ROAD, JINAN, CHINA
Related Directives and Annex : **2006/42/EC Machinery Directive/Annex VIII**
Related Standards : **EN ISO 12100:2010, EN 60204-1:2018**
Product Name : **TESTING MACHINE**
Report No and Date : TCF-JHIC230128-MD
Product Brand/Model/Type : WDS-1, WDS-2, WDS-3, WDS-5, WDS-10, WDS-20, WDS-30, WDS-50, WDS-100, WDS-200, WDS-300, WDS-500, WDW-1, WDW-2, WDW-3, WDW-5, WDW-10, WDW-20, WDW-30, WDW-50, WDW-100, WDW-200, WDW-300, WDW-500, WDW-600, WDW-1000, WE-300, WE-600, WE-1000, WE-2000, WEW-300, WEW-600, WEW-1000, WEW-2000, WAW-300, WAW-600, WAW-1000, WAW-2000, WAW-3000, WAW-5000, WAW-6000, LAW-1000, JB-300B, JBS-300, JBW-300, JB-500B, JBS-500, JBW-500, JBW-750, CST-50, VU-2Y, VU-1S, DWC-40, DWC-60, DWC-80, DWC-100, DWC-196, YES-2000, YES-300, YAW-1000, YAW-300, YAW-2000, YAW-3000, YAW-5000, NDS-200, NDS-500, NDS-1000, NDS-2000, NDW-200, NDW-500, NDW-1000, NDW-2000, NDW-3000, NDW-5000, NDW-10000, HEZ-3, HEZ-6, HEZ-10, JWJ-10, TLS, TLW, HST-P50, HST-P100, HST-P200, HST-P300, RDJ, NDT, DWTT, GBW-60, GW-50, HST, XNR-400

Certificate Number : **M.2023.206.C81366**
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Expiry Date : **31.01.2028**


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