

The following Type tests shall be demonstrated on the Splice Enclosure(s) (Splice Enclosure/Box). For certain tests, lengths of the fiber optic cable shall be installed in the splice box, and the fibers must be spliced and looped in order to simulate conditions of use. The attenuation of the fibers shall be measured, during certain tests, by relevant Fiber Optic Test Procedures (EIA/TIA 455 or IEC 60794-1 procedures).

**List of test items**

| S.No. | TEST NAME                | APPLICABLE STANDARD         | TEST RESULT<br>(PASS/ FAIL) |
|-------|--------------------------|-----------------------------|-----------------------------|
| 1     | Temperature cycling Test | EIA 445-20/IEC 60794-1-C 10 |                             |
| 2     | Humid Heat Test          | IEC 60794-1 or EIA/TLA 455  |                             |
| 3     | Water Immersion Test     | IEC 60060 or EIA/TLA 455    |                             |
| 4     | Vibration Test           | IEC 60794-1 or EIA/TLA 455  |                             |
| 5     | Bending and Torsion Test | IEC 60794-1 or EIA/TLA 455  |                             |
| 6     | Tensile Test             | IEC 60794-1 or EIA/TLA 455  |                             |
| 7     | Drop Test                | IEC 60068-2-32              |                             |

**Type Test procedure for Temperature Cycling Test**

Test Name : **Temperature Cycling Test**  
Final Customer : Purulia Kharagpur Transmission Company Limited (PKTCL)  
Project :  
Name :  
Manufacturer :  
Box Type :  
Standard : (EIA 455-20/IEC 60794-1-C 10).

**TEST SET-UP**

Fiber Optical cable is installed in the splice enclosure and optical fiber spliced and looped.

**TEST PROCEDURE**

The Joint box must be subjected to 5 cycles of temperature variations of -40°C to +65°C with a dwell time of at least 2 hours on each extreme.

Fiber loop attenuation shall be measured in accordance with EIA 455-20 / IEC 60794-1-C10. The variation in attenuation will be recorded in the form of plots/graphs.

**ACCEPTANCE CRITERIA**

Variation in attenuation shall be less than  $\pm 0.05$  dB. The final humidity level, inside the box, shall not exceed the initial level, at the closing of the box.

**Conclusion**

The joint box meets the acceptance criteria of temperature cycling test.

**(TESTED BY)**

Sign & Date

**(WITNESSED BY)**

Sign & Date

**Type Test procedure for Humid Heat Test**

Test Name : **Humid Heat Test**

Final Customer :

(PKTCL) Project Name

:

Manufacturer :

Box Type :

Standard : (IEC 60794-1 or EIA/TLA -455).

**TEST SET-UP**

Fiber Optical cable is installed in the splice enclosure and optical fiber spliced and looped.

**TEST PROCEDURE**

The sealed Joint box, with fibers spliced and looped inside, must be subjected to a temperature of +55°C

±2°C with a relative humidity rate of between 90% and 95%

for 5 days. The variation attenuation of the fibers will be recorded through graphs.

**ACCEPTANCE CRITERIA**

The attenuation variation of the fibers during the duration of the test shall be less than ±0.05dB, and the Internal humidity rate measured, less than 2%.

**Conclusion**

The joint box meets the acceptance criteria of Humid Heat Test.

**(TESTED BY)**

Sign & Date

**(WITNESSED BY)**

Sign & Date

**Type Test procedure for Rain Withstand Test/Water  
Immersion Test**

Test Name : **Water Immersion Test.**

Final Customer :

(PKTCL) Project Name

:

Manufacturer :

Box Type :

Standard : IEC 60060 or EIA/TLA 455

**TEST SET-UP**

Fiber Optical cable is installed in the splice enclosure and optical fiber spliced and looped.

**TEST PROCEDURE**

The Joint Box with optical fibers cable installed and fibers spliced fixed, is subjected to 24 hours of Water immersion in accordance with IEC 60060 testing requirements.

**ACCEPTANCE CRITERIA**

1. No water seepage or moisture was detected in the joint box.
2. The attenuation variation of the fibers after the test shall be less than  $\pm 0.05\text{dB}$ .

**Conclusion**

The joint box meets the acceptance criteria of Rain withstand Test/Water Immersion Test.

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**Type Test procedure for Vibration Test**

Test Name : **Vibration Test**

Final Customer :

(PKTCL) Project Name

:

Manufacturer :

Box Type :

Standard : (IEC 60794-1 or EIA/TLA 455).

**TEST SET-UP**

The Joint box, with fiber united inside, is installed on vibration in the horizontal vertical direction separately with a frequency scanning of 5 to 50HZ.

**TEST PROCEDURE**

The amplitude of the vibrations shall be constant at 0.450mm, peak to peak, for 2 hours, for each of the Vibrations direction. Variation in attenuation shall be recorded.

**ACCEPTANCE CRITERIA**

1. The Variation in attenuation of the fibers shall be less than  $\pm 0.05\text{dB}$ .
2. The joint box shall be examined for any defects or deformation. There shall be no loosening or Visible damage of the OPGW cable at the entry point.

**Conclusion**

The joint box meets the acceptance criteria of Vibration Test.

**(TESTED BY)**

Sign & Date

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Sign & Date

**Type Test procedure for Bending and Torsion Test**

Test Name : **Bending and Torsion Test**

Final Customer :

(PKTCL) Project Name

:

Manufacturer :

Box Type :

Standard : (IEC 60794-1 or EIA/TLA 455).

**TEST SET-UP**

OPGW is installed in the joint box and optical fiber is spliced and looped inside.

**TEST PROCEDURE**

The splice enclosure, with fibers spliced inside, shall be firmly held in place, and be subjected to The Following sequence of mechanical stresses on the cable:

- a) 3 torsion cycles of  $\pm 180^\circ$  shall be exercised on the cable. Each cycle shall be less than one minute.
- b) 3 bending cycles of  $\pm 180^\circ$  shall be exercise on the cable. Each cycle shall be less than one minute.

**ACCEPTANCE CRITERIA**

1. The Variation in attenuation of the fibers shall be less than  $\pm 0.05\text{dB}$ .
2. The cables connection ring shall remain securely fixed to the box with the connection Maintained Firmly.
3. No defects and fissures shall be noted on the joint ring or on the joint box.

**Conclusion**

The joint box meets the acceptance criteria of Bending and Torsion Test.

**(TESTED BY)**

Sign & Date

**BY)**

**(WITNESSED**

Sign & Date

**Type Test Procedure for Tensile Test**

Test Name : **Tensile Test.**  
Final Customer : (PKTCL)  
Project Name :  
Manufacturer :  
Box Type :  
Standard : (IEC 60794-1 or EIA/TLA 455).

**TEST PROCEDURE**

The joint box with cable fixed to the boxes is subjected to a minimum tension of 448 N for a period of two minutes.

**ACCEPTANCE CRITERIA**

No fissure shall be noted in the connections or on the box.

**Conclusion**

The joint box meets the acceptance criteria of Tensile Test.

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Sign & Date

**Type Test Procedure for Drop Test**

Test Name : **Drop Test**  
Final Customer : (PKTCL)  
Project Name :  
Manufacturer :  
Box Type :  
Standard : (IEC 60068-2-32).

**TEST PROCEDURE**

With 2 lengths of 11 meters of cable fixed to the box, it has to be dropped five times from a height of 10 meters.

**ACCEPTANCE CRITERIA**

There shall be no fissure at all the box, and the connections shall remain tight.

**Conclusion**

The joint box meets the acceptance criteria of Drop Test.

**(TESTED BY)**  
Sign & Date

**(WITNESSED BY)**  
Sign & Date