

JSCE-E 709-2010

Test method for the abrasion resistance of plastic sheath for prestressed concrete (draft)

1 Scope

This standard specifies the requirements for carrying out the test to check the abrasion resistance of a plastic sheath used to form a duct to arrange inner cables of prestressed concrete structures. The plastic sheath considered in this standard should use high-density polyethylene or a material with performance not lower than that of high-density polyethylene.

2 References

By being cited herein, the following standards constitute part of the definition of this standard. This standard is based on the latest versions of these cited documents.

JIS G 3109 Steel bars for prestressed concrete

JIS G 3536 Steel wires and strands for prestressed concrete

JIS B 7721 Tension/compression testing machines - Verification and calibration of the force-measuring system

3 Definitions

The following terminology is used in this standard:

Sheath specimen: specimen made by cutting the sheath or specimen of the sheath joint part

4 Outline of test

4.1 Purpose of test

The abrasion resistance of a plastic sheath used for PC steel bars specified by JIS G 3109 and PC steel wires and PC steel strands specified by JIS G 3536 is examined.

4.2 Conditions of testing room

The standard temperature of the testing room is 23 ± 5 °C unless otherwise specified. The relative humidity is not specified.

4.3 Specimens

The number of sheath specimens is three unless otherwise specified. The specimen length should be no less than 100 mm with at least one spacing between ribs, being cut from the plastic sheath. The width of the specimen is no less than 1/4 of the perimeter of the plastic sheath.

4.4 Test specimen

The test block stand⁽¹⁾ is set to the test specimen so that the sheath specimen (shaded part) can be fixed as shown in Fig.1.

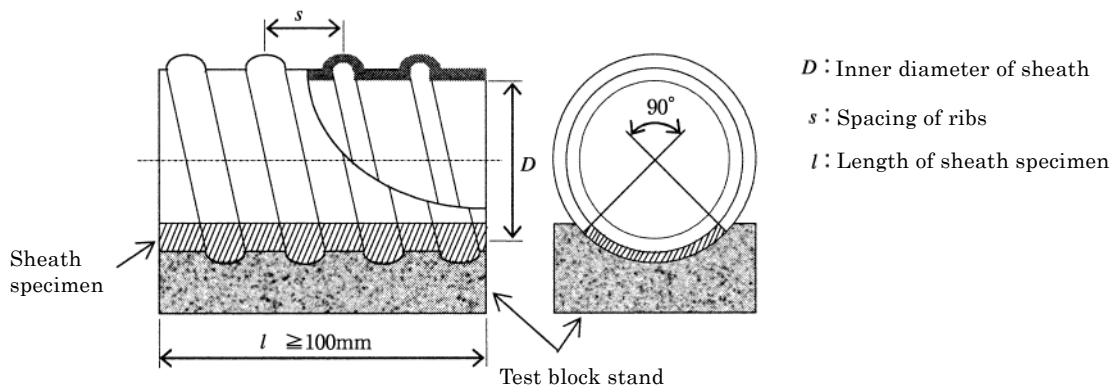


Fig.1 Outline of abrasion resistance test specimen of plastic sheath

Note⁽¹⁾: The test block stand to set the specimen transfers the fixing force (lateral pressure load) through PC tendon and sheath specimen. Also, it is subjected to the pull-out force of PC tendon as a shear force. Therefore, the test block stand should use a material which does not cause slip with the sheath specimen at the moments of application of fixing forces and movement of the PC tendon, and damage such as cracking.

4.5 Test apparatus

An example of test apparatus is shown in Fig.2. The device to compress the test specimen⁽²⁾ should use a hydraulic jack with a load cell compatible with JIS B 7721 or a mechanical compression loading machine. A center-hole jack, for example, is used for the apparatus to move the PC tendon. The PC tendon should be compatible with JIS G 3109 or JIS G 3565. The standard length of the PC tendon is at least 1 m.

Note⁽²⁾: The loading plate to compress the test specimen should have a structure which does not

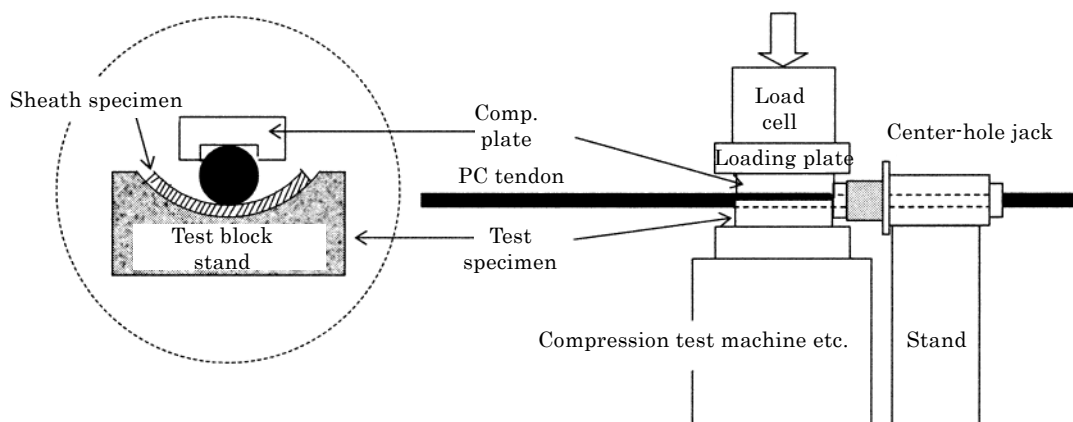


Fig.2 Example of abrasion resistance testing apparatus

deform in compression and does not cause slip at the moment of movement of the PC tendon. Also, it should be made sure that the fixing force is applied uniformly to the test specimen to prevent a harmful lateral load to the compressing apparatus.

5 Test method

a) A PC tendon is placed at the center on the top of the test specimen, and the loading plate is set right on the PC tendon to apply the specified lateral pressure load to fix the test specimen.

b) Under the fixing condition by compression, the PC tendon is pulled out at the rate causing movement of 800 mm in about 2 minutes. When a center-hole jack is used, the PC tendon should be pulled out by the specified displacement by repetitively resetting the jack position.

c) After completing pull-out, the sheath specimen is taken out from the test block stand of the test specimen.

d) After closing both ends of the sheath specimen taken out from the test specimen using vinyl tape, for example, and pouring water on the surface which is in contact with the pulled out PC tendon as shown in Fig.3, the condition of water leak is examined. The temperature of water is set at the room temperature.

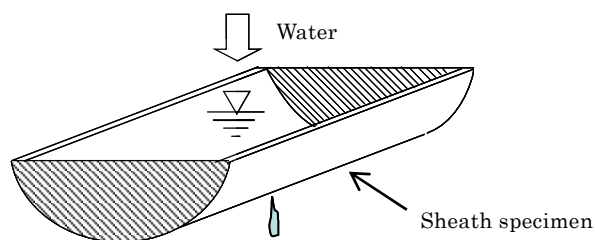


Fig.3 Method to confirm water leak

6 Report

6.1 Compulsory reporting

The report must provide the following information:

- a) Date of test
- b) Name, type and capacity of testing machine
- c) Material, inner diameter, outer diameter, shape and brand of sheath
- d) Type of PC tendon
- e) Number of sheath specimens
- f) Test conditions (load for lateral pressure (kN), and frictional slip (mm))
- g) Damage condition of test specimen and condition of water leak
- h) Temperature of testing room and water
- i) Place of test
- j) Person who tested

6.2 As-needed reporting

The report should provide the following information where relevant:

- a)** Name of testing organization
- b)** Relative humidity of testing room