

JSCE-E 702-2010

Test method for the resistance of metal sheath for prestressed concrete under uniform compressive loading (draft)

1 Scope

This standard specifies the requirements for carrying out the test for the resistance under uniform compressive loading of a metal sheath used to form a duct to arrange inner cables of prestressed concrete structures. The metal sheath considered in this standard should use cold-rolled steel plate, zinc-coated steel plate, or a metal material with performance not lower than those.

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 3101 Rolled steels for general structure

JIS G 3109 Steel bars for prestressed concrete

JIS G 3536 Steel wires and strands for prestressed concrete

3 Definitions

The following terminology is used in this standard:

Sheath specimen: specimen made by cutting the sheath

4 Outline of test

4.1 Purpose of test

This test method is used to confirm the resistance under uniform compressive loading of a metal sheath used for PC steel bars specified by JIS G 3109, and PC steel wires and strands specified by JIS G 3536.

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 length of the sheath specimen is at least four times as large as the inner diameter (nominal diameter) of the sheath.

4.4 Test apparatus

The testing machine should be such that can measure loads with accuracy with a margin of error of no more than $\pm 5\%$.

5. Test method

a) Apply to the sheath specimen the load calculated by the following equation for 10 minutes by the method shown in Fig.1 and check the deformation condition of the sheath specimen. Insert a sponge⁽²⁾ between the loading plate⁽¹⁾ and the sheath specimen. In the case where a load larger than the value given by Eq.(1) is expected, the specimen is tested for that load value.

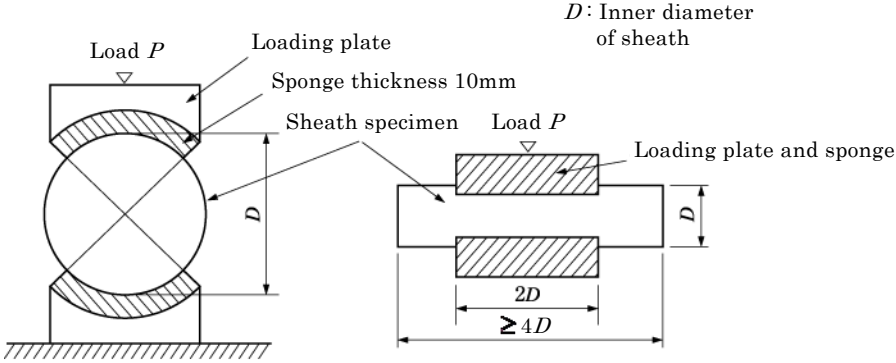


Fig.1 Outline of test

$$P=0.1\pi D^2 \dots\dots\dots (1)$$

where P : load(N)

D : inner diameter of sheath (mm)

Note⁽¹⁾: The material of the loading plate should be rolled steel plate for general structures (JIS G 3101).

Note⁽²⁾: The sponge inserted between the loading plate and the sheath specimen should have the shape-following property to secure uniform lateral pressure to the sheath specimen.

b) After the test described in a), embed the bottom end of the sheath specimen into a stand block of rubber or clay as shown in Fig.2 so that cement paste or water would not leak from the embedment position. Pour cement paste⁽³⁾ with a water-cement ratio 50% up to 5 to 10 mm from the top end. Then check if there is a leak of cement paste and water for 30 minutes after pouring. The temperature of poured cement paste is not specified.

Note⁽³⁾: Ordinary Portland cement is used for the cement of the cement paste. No additive is used for the cement paste. Cement paste should be mixed by the same method as for the grout. The cement paste should be poured into the sheath specimen promptly after mixing.

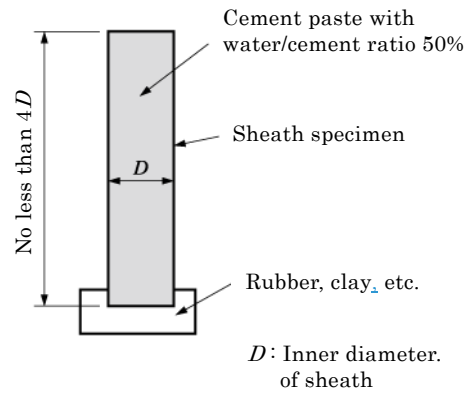


Fig.2 Sheath specimen setting method

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) Number of sheath specimens
- e) Temperature of testing room and poured cement paste at pouring
- f) Quality of cement paste
- g) Leak condition of cement paste and water, and condition of sheath specimen after loading

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