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**INDUSTRY STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

LY/T 3202-2020

**Bamboo winding utility tunnel
(English Translation)**

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Foreword

This standard was drafted in accordance with the rules of GB/T 1.1-2009.

This standard was proposed and managed by the National Bamboo and Rattan Standardization Technical Committee (SAC/TC 263).

1 Scope

This standard specifies the terms and definitions, classification and marking, raw materials, technical requirements, test methods, inspection Rules, signs, lifting, transportation and storage.

This standard is applicable to the nominal inner diameter of 2000 mm~5000 mm, the ring stiffness grade is 7500 N/m²~30000 N/m², the application ring the bamboo winding pipe gallery with the ambient temperature of -40°C~80°C, and other bamboo winding pipe gallery with nominal inner diameter and ring stiffness grade can also be used as reference.

2 Normative references

The following documents are indispensable for the application of this document. For dated reference documents, only the dated version applies to this document. For undated references, the latest version (including all amendments) applies to this document.

GB/T 1447 Test method for tensile properties of fiber reinforced plastics GB/T 1448 Test method for compressive properties of fiber reinforced plastics GB/T 1463 Fiber-reinforced plastic density and relative density test method GB/T 2567-2008 Resin casting body performance test method GB/T 4380 Roundness Error Evaluation Two-point and Three-point Method GB/T 5352 Fiber-reinforced thermosetting plastic pipe parallel plate external load performance test method GB/T 9978.8 Fire test method for building elements Part 8: Special requirements for non-load bearing vertical partition elements GB/T 14074-2017 Wood industry adhesives and resin inspection methods GB/T 15780-1995 Test method for physical and mechanical properties of bamboo GB 50838 Technical Code for Urban Comprehensive Pipe Gallery Engineering LY/T 2905-2017 Bamboo winding composite pipe

3 Terms and definitions

The following terms and definitions apply to this document.

Bamboo winding utility tunnel; BWUT the pipe gallery body is made of bamboo as the base material, thermosetting resin as the adhesive, and the winding process. By the fire protection layer, Reinforcement layer and outer protective layer composition, see Figure 1.

Figure 1 Structure diagram of bamboo winding pipe gallery

Ring stiffness

Refers to the load that a unit length of the pipe gallery bears under a certain radial deformation under the action of external pressure.

Surface water absorption After sealing the circumference and inside of the pipe gallery specimen with resin, the water absorption rate of the specimen was tested after soaking in water for 24 hours.

Structural layer

The bearing layer of the pipe gallery is composed of bamboo and thermosetting resin.

Straight joint

It is used to connect two pipe gallery fittings with the same nominal inner diameter.

4.1 Classification

According to the connection mode, it can be divided into A type (socket type) and B type (bundle type).

4.2 Marking

The marking method is as follows.

5.1 Bamboo material

The basic unit of the bamboo used is bamboo strips, and its main performance should meet the requirements of Table 1.

5.2 Thermosetting resin

Should meet the requirements of Table 2.

6.1 Appearance quality

The surface should be smooth and flat, free of defects such as delamination, lack of glue, cracks, bubbles, etc.; the end surface should be flat, without burrs on the edges, and the outer surface should Flat and defect-free.

6.2.1 Nominal inner diameter, inner diameter size and allowable deviation

Nominal inner diameter is 2000 mm, 2200 mm, 2400 mm, 2600 mm, 2800 mm, 3000 mm, 3200 mm, 3400 mm, 3600 mm, 3800 mm, 4000 mm, 4500 mm, 5000 mm, the size of the inner diameter and its allowable deviation should conform to Table 3 Regulations.

6.2.2 Length and allowable deviation

Should meet the requirements of Table 4.

6.2.3 End face perpendicularity

Should meet the requirements of Table 5.

6.2.4 Permissible deviation of roundness

Should meet the requirements of Table 6.

6.2.5 Wall thickness

The minimum wall thickness of different ring stiffness grades should meet the requirements of Table 7.

6.2.6 Socket size

The schematic diagram of the socket is shown in Figure 2, α is 12° , β is 15° ; the size of the socket and its allowable deviation should meet the requirements of Table 8.

6.3 Density

0.9 g/cm³~1.0 g/cm³.

6.4 Fire resistance limit

It shall meet the requirements of section 7.1.3 of GB 50838.

6.5 Surface water absorption

Should be $\leq 3\%$.

6.6.1 Ring stiffness

The ring stiffness grades are 7500 N/m², 10 000 N/m², 15 000 N/m², 20 000 N/m², 25 000 N/m², 30 000 N/m², Non-standard ring stiffness grade pipe gallery can be designed according to the ring stiffness formula.

6.6.2 Axial tensile strength

Should be ≥ 10 MPa.

6.6.3 Compressive strength

Should be ≥ 10 MPa.

6.6.4 Flexibility

The deflection level A and deflection level B shall meet the requirements of Table 9. The provisions of Table 9 are based on the long-term use of the maximum deflection of 3% Based on.

7.2.1 Measuring instruments

7.2.1.1

pi ruler, division value 0.2 mm and 1 mm.

7.2.1.2

Steel tape, with a graduation of 1 mm.

7.2.1.3

Steel ruler with 1 mm graduation.