



《Bamboo Winding Composite Pipe》

**Zhejiang Xinzhou Bamboo based Composite
Materials Technology Co., Ltd**



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The background of the slide is a lush green bamboo forest. A large, semi-transparent blue geometric shape, resembling a stylized arrow pointing right, is overlaid on the left and center of the image. The number '01' is written in large white font on the left side of this blue shape.

01

Introduction To Bamboo Wrapped Composite Pipe



Bamboo Winding Composite Pipe

- Definition

A new type of bio based pipeline is made of bamboo as the substrate, resin as the adhesive, and processed by winding technology.

- Principle

Fully utilize the high axial tensile strength of bamboo to form a stress free defect distribution in the product structure, in order to meet the mechanical performance requirements of pipelines.

- FEATURES

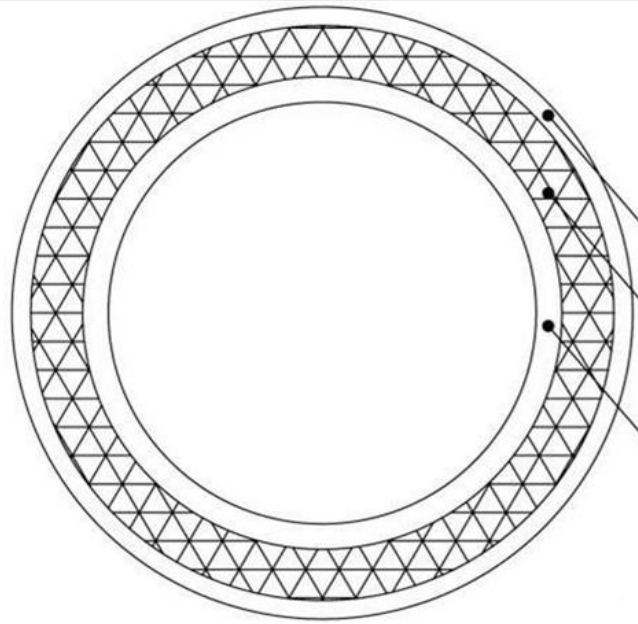
It has the characteristics of renewable raw materials, energy conservation and emission reduction, carbon sequestration and storage, light weight and high strength, good insulation performance, resistance to seawater corrosion, good sound insulation performance, and good fire resistance.

- Application scope

Bamboo wrapped composite pipes can be widely used in fields such as agricultural irrigation, water transportation, urban water supply and drainage, and sewage pipe network construction.



Bamboo Winding Composite Pipe——Performance Index



Outer protective layer

Structural layer

Liner



specifications	DN150-DN3000mm
density	0.95-1.0 g/cm ³
Working pressure	≤1.6MPa
Working temperature	-40℃-80℃
Service life	≥50years
Flammability	B1
Medium temperature	≤90℃
Thermal conductivity	0.2 W/(m·k)

Initial ring stiffness	≥5000N/m ²
Axial tensile strength	10-24MPa
Flexural modulus	2.6 GPa
Transient failure water pressure	≥ 3times of pipe pressure level
Inner surface roughness	0.0084-0.01
Surface water absorption	≤3%
Coefficient of linear expansion	≤2×10 ⁻⁵ 1/℃
Insoluble content of inner liner	≥92%

Bamboo Winding Composite Pipe-Advantages of similar products

Performance	bamboo wrapped composite pipe	welded steel pipe	plastic pipe	prestressed steel cylinder concrete pipe
Specific gravity (g/cm ³)	0.95-1.0	7.85	0.95~1.4	2.7
Length (m)	12	4-6	12	5
Stiffness	high	high	low	high
The ability to resist internal pressure	high	high	low	low
Coefficient of friction	0.011	0.024	0.012	0.024
Fluid transportation energy consumption	low	high	low	high
Corrosion resistance	good	poor	good	poor
Thermal insulation	good	poor	good	average
Accumulation of dirt	not easy to accumulate dirt	easy to accumulate dirt	not easy to accumulate dirt	easy to accumulate dirt
Impact on water quality	none	yes	none	yes
Transportation costs	low	high	low	high
Installation labor intensity	low	high	low	high
Installation technical requirements	low	high	low	high
The number of pipeline joints	few	many	many	many
Impermeability	good	average	good	poor
Wear resistance	good	average	good	poor
Operation and maintenance	none	cathodic protection required	none	none
Service life	≥ 50 years	35 years	30 year	40 years
Comprehensive cost	low	high	high	high

Bamboo Winding Composite Pipe-Application scenarios



Bamboo Winding Composite Pipe-international repercussions



Development of Bamboo and Rattan for Belt and Road, Beijing



China ASEAN Housing Ministers Roundtable, Kuala Lumpur



China-Philippines Innovation Technology Dialogue of Bamboo Utilization, Philippines

At present, more than 300 representatives from over 40 developing countries have come to study bamboo winding composite material technology, including the Philippines, Nepal, Myanmar, Tanzania, Cambodia, and others.



2017 G-STIC , Brussels



UN Climate Change Conference, Bonn



Visit to Nepal

02

Standard Preparation



Standard leading unit

The leading unit of this standard is Zhejiang Xinzhou Bamboo based Composite Material Technology Co., Ltd., which is the inventor of bamboo winding composite material technology. It has been 18 years since its research and development in 2007, and has independently innovated and developed bamboo winding composite materials represented by bamboo winding composite pipes. The characteristics of bamboo, such as renewability, high axial tensile strength, good flexibility, energy saving and low-carbon, have been developed and applied to industrial product fields such as pipelines and pipe galleries.



Outline of Standard Compilation

- **Scope of regulations:**

This standard specifies the definition, classification, raw materials, technical requirements, inspection methods, testing rules, as well as marking, labeling, packaging, transportation, and storage of bamboo winding composite pipes.

- **Scope of application:**

This standard is applicable to bamboo winding composite pipes used in water conservancy, municipal, industrial water supply and drainage engineering with a nominal inner diameter of 150mm~3000mm, a pressure rating not exceeding 1.6MPa, a ring stiffness rating of 5000N/m²~2000N/m², an application environment temperature of -40 °C~80 °C, and a maximum temperature of the conveying medium not exceeding 90 °C.



- **Outline preparation:**

1. Scope
 2. Normative reference documents
 3. Terminology and definitions
 4. Classification and labeling
 5. Raw materials
 6. Technical requirements
 7. Test method
 8. Inspection rules
 9. Proof of appearance, packaging, transportation, and storage
 10. Pipe fittings
- Appendix A Test Method for Resin Content of Inner Lining Layer
- Appendix B Initial circumferential tensile strength test
- Appendix C Initial Axial Tensile Strength Test
- Appendix D Pipe Fitting Technology

Significance of standard compilation

——Bamboo Winding composite pipes have the characteristics of renewable raw materials, energy conservation and carbon reduction, and carbon storage and fixation. They can replace high energy consuming materials such as steel, cement, and plastic. The formulation of this standard will promote bamboo Winding composite pipes to become an important solution for the low-carbon transformation of global infrastructure.

——At present, the international perspective is highly concerned about bamboo Winding composite materials. This standard unifies technical parameters and inspection methods, providing a standard basis for the promotion and application of bamboo Winding Composite pipes in the international market, and ensuring product quality.

——Three quarters of the global bamboo resources are distributed in Southeast Asia, Central and Eastern Africa, and Central and South America, with over 95% growing in developing countries. Bamboo Winding Composite technology can be applied to make good use of local bamboo resources, processed into bamboo Winding composite pipes, and build beautiful homes on the basis of green and low-carbon. At the same time, it can increase rural economic income, improve social employment rate, and promote national economic development. The introduction of this standard will assist in the efficient and high-quality utilization of bamboo resources worldwide.





Thank You!