



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

**GB/T 7690.1-2013**

Replacing GB/T 7690.1-2001

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**Reinforcements - Test methods for yarns - Part 1: Determination  
of linear density**

增强材料 纱线试验方法 第1部分：线密度的测定

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### Foreword

GB/T 7690 "Test method for yarns enhanced" is divided into six sections.

- Part 1. Determination of linear density;
- Part 2. Determination of twist;
- Part 3. Glass fiber breaking force and elongation measurement;
- Part 4. Determination of stiffness;
- Part 5. Determination of glass fiber diameter of the fiber;
- Part 6. Determination of twist balance index. This section GB/T 17690 Part of. This section drafted in accordance with GB/T 1.1-2009 given rules. This Part replaces GB/T 7690.1-2001 "Enhanced Part

1 Test method for yarns. Determination of linear density", and GB/T 7690.1-2001 main differences are as follows:

- In a broader range of applications, in addition to the original standard glass fiber coated carbon fiber and aramid fiber yarn, but also includes other Reinforcing fibers (see Chapter 1);
- Remove the "Reference Standards" GB/T 18374, an increase of ISO 291, ISO 1887 and ISO 3344, ISO 10548. 2002 (see Chapter 2, Section 2 of the 2001 edition);
- "Terms and Definitions" Added "line density" is defined (see 3.1);
- "Principle," adds carbon fiber linear density measurement principle expressed content (see Chapter 4). This section uses the translation method identical with ISO 1889.2009 "Enhanced measurement of linear density of yarn." This part made the following editorial changes.
- Consistent with the existing standard series, the standard name will be changed to "Enhanced Test method for yarns - Part 1. linear density measurement set". Consistency

correspondence between this international document standards and the references of the following criteria.

--- GB/T 2918-1998 plastic sample conditioning and testing of the standard environment (ISO 291.1997, IDT);

## 1 Scope

GB/T 7690.1 specifies how the linear density of a reinforcement yarn is determined: the mass per unit length, in tex, of the glass, carbon, aramid or basalt yarn that goes into a composite. It is the first and most basic of the reinforcement yarn test methods and it underlies almost everything else, because the linear density is how the yarn is bought and sold, how the fibre volume fraction of a laminate is calculated, and the denominator in the specific strength and modulus figures the material is compared on. The standard specifies the principle, the apparatus including the balance and the length measuring device, the sampling and the conditioning of the specimens in the standard atmosphere, the removal of the sizing where that is required, the length of yarn taken and the number of determinations, the procedure, the calculation of the linear density and its expression, the precision and the test report. This is the clear-print edition. For a yarn producer, a composites manufacturer or a testing laboratory in China, this is the reference method.

GB/T 7690 provisions of this part of the glass fiber, carbon fiber, aramid fiber or other reinforcing fiber yarn measuring method of linear density. This method is applicable to all types of yarn, including yarn and twisted yarn, cable, textured yarns, rovings and staple fiber yarn.

## 2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

ISO 291 environmental standard plastic sample conditioning and testing  
(Plastics-Standardatmospherefor conditioningandtesting)

ISO 1887 Determination of combustible textile glass fiber content  
(Textileglass-Determinationofcombustible- mattercontent)

ISO 3344 Determination of moisture content enhancement products  
(Reinforcementproducts-Determinationofmoisture content)

ISO 10548.2002 Determination of carbon fiber sizing content  
(Carbonfibre-Determinationofsizecontent)

### 3 Terms and Definitions

The following terms and definitions apply to this document.

3.1 Linear density lineardensity < Yarns> yarn mass per unit length with or without a wetting agent. NOTE. Normally the unit using tex, equivalent per kilometer yarn quality is 1g.

Principle

4 Known mass weighed yarn sample containing wetting agents or removal length, calculate the mass per unit length. Wetting agent can be removed by extraction and drying (aramid fiber), burning (glass fiber), extraction or pyrolysis (carbon fiber) method. For carbon fiber yarn to remove sizing yarn linear density can be calculated from the density and wetting agent content yarn line containing wetting agents to give. Wetting agent content according to ISO 10548.2002 measured. However, due to the presence of measurement error due to the inherent sizing content obtained by calculation There is a small error will result.

#### 5.1 Determination of yarn containing sizing instruments

5.1.1 bobbin circumference 1m. Generally means yarn with the outlet, to form a uniform thin yarn is wound. Also with a power plant,