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

GB/T 19396-2025

Replacing GB/T 19396-2012

Terbium-dysprosium-iron magnetostrictive materials

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document replaces GB/T 19396-2012 "Terbium Dysprosium Iron Giant Magnetostrictive Materials". Compared with GB/T 19396-2012, except for the structural adjustment In addition to the integration and editorial changes, the main technical changes are as follows.

- a) The terms and definitions have been changed (see Chapter 3, Chapter 3 of the 2012 edition);
 - b) The grade designation method (see Chapter 4, 4.1 of the 2012 edition) and the parallel magnetostriction coefficient (see 5.1 of the 2012 edition) have been changed. 4.1);
 - c) Added the requirements for relative magnetic permeability and magnetostriction non-uniformity in the physical properties (see 5.2), and changed the requirements for compressive strength in the physical properties.
- Density index, deleted the density requirement in physical properties (see 5.2, 4.3 of the 2012 edition);
- d) The requirements for dimensions and their allowable deviations have been changed (see 5.3, 4.2 of the 2012 edition);
 - e) Added the test methods for relative magnetic permeability and magnetostriction non-uniformity in physical properties (see 6.2), and deleted the test method for density.
- Law (see 5.3 of the 2012 edition);
- f) The provisions of the inspection items have been changed (see 7.3, 6.3 of the 2012

edition);

- g) The sampling method has been changed (see 7.4, 6.4 of the 2012 edition);
- h) The determination of test results has been changed (see 7.5, 6.5 of the 2012 edition);
- i) The packaging, labeling, transportation and storage methods have been changed (see 8.1, 7.1 and 7.2 of the 2012 edition);
- j) The accompanying documents have been modified (see 8.2, 7.3 of the 2012 edition);
- k) The instruction manual has been deleted (see 7.4 of the 2012 edition);
- l) Added the test methods for magnetostriction non-uniformity and magnetostriction temperature coefficient (see Appendix C);
- m) Added the measurement of the overall magnetostriction coefficient of terbium-dysprosium ferromagnetostrictive material - laser displacement measurement method (see Appendix D).

Please note that some of the contents of this document may involve patents. The issuing organization of this document does not assume the responsibility for identifying patents.

This document was proposed and coordinated by the National Rare Earth Standardization Technical Committee (SAC/TC229).

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This document was first issued in 2003, revised for the first time in 2012, and this is the second revision.

Terbium-dysprosium ferromagnetostrictive material

1 Scope

This document specifies the grades, technical requirements, inspection rules and packaging, marking, transportation, storage and accompanying documents of terbium dysprosium ferromagnetic strictive materials.

The corresponding test methods are described.

This document applies to terbium dysprosium ferromagnetostrictive materials produced by directional solidification process, which are mainly used in sonar transducers, ultrasonic transducers, Active shock absorbers, fuel injection valves, sensors and other fields.

2 Normative references

GB/T 1958

GB/T 2828.1-2012

GB/T 7314

GB/T 9637

GB/T 13012

GB 39176

3 Terms and definitions

The terms and definitions defined in GB/T 9637 and the following apply to this document.

3.1

The rate of dimensional change of a material under the action of an external magnetic field.

3.2 $\lambda_{//}$

The rate of dimensional change of the material when the measurement direction is parallel to the external magnetic field.

3.3 (1)

Under a certain magnetic field and pre-stress, the dimensional change rate of the material at different positions is different.

Note. The calculation of magnetostriction non-uniformity is shown in formula (1). $N\lambda = \frac{\max \lambda_{//1} - \lambda_{//} \lambda_{//} , \lambda_{//2} - \lambda_{//} \lambda_{//} , \lambda_{//3} - \lambda_{//} \lambda_{//} , \lambda_{//N} - \lambda_{//} \lambda_{//}}{\lambda_{//}} \div \times 100\%$