

ICS 29.100.10
CCS L 19



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

GB/T 43795-2024

**Test method for the mechanical strength of cores made of
magnetic oxides**

磁性氧化物制成的磁心机械强度测试方法

(English Translation)

Issued on: March 15, 2024

Implemented on: October 1, 2024

**Issued by: State Administration for Market Regulation, China National
Standardization Administration**

Table of Contents

Preface

Introduction

1 Scope

2 Normative references

3 Terms and Definitions

4 Device

4.1 Test core support and loading head

4.2 Test equipment

4.3 Humidity measurement device

5 Test core

5.1 General

5.2 Number of test cores

5.3 Note

6 Test

6.1 Test Condition

6.2 Test Procedure

6.2.1 General

6.2.2 Test of E-type core

6.2.3 Test of Type I Core

6.2.4 Testing of toroidal core

Appendix A (Normative) Standard dimensions of E-type magnetic core and its bracket for strength test

A.1 Dimensions of E-type cores

A.2 Test core bracket

Appendix B (Normative) Standard dimensions and strength test methods for toroidal cores

B.1 Dimensions of toroidal core

B.2 Selection of mechanical strength test methods for toroidal cores

Reference

Figure 1 E method test

Figure 2 W method test

Figure 3 T method test

Figure 4 M method test

Figure 5 Type I test

Figure 6 Stretching method

Figure 7 Shearing method

Figure 8 Pressure method

Figure A.1 Dimensions of E-type core

Figure B.1 Dimensions of toroidal core

Table A.1 Test core bracket

Table B.1 Dimensions of toroidal cores

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 is modified to adopt IEC 61631:2020 "Methods of test for mechanical strength of magnetic cores made of magnetic oxides".

This document has made the following structural adjustments compared to IEC 61631:2020.

---6.2.4.1 corresponds to 6.2.4.1 and 6.2.4.2.1 of IEC 61631:2020, 6.2.4.2 corresponds to 6.2.4.2.2 of IEC 61631:2020, 6.2.4.3 corresponds to 6.2.4.2.3 of IEC 61631:2020, and 6.2.4.4 corresponds to 6.2.4.2.4 of IEC 61631:2020;

--- Deleted A.1 of IEC 61631:2020 and moved part of its content to A.2.

The following editorial changes were made to this document.

--- Added the nominal size description of L and H (see A.2);

--- Changed the order of footnotes in Table A.1 and merged the footnote contents;

--- Changed the title of B.1 to reflect the content of the text.

Introduction

The purpose of this document is to bring all parties together to agree on material development, quality testing, performance evaluation and data collection.

This document strictly defines the placement of the test sample and the function of the test instrument, including the test fixture.

In order to compare the performance of magnetic oxide cores, all relevant factors are listed in the test results.

It is not possible to strictly standardize a specific surface treatment. However, it is advisable to state the surface condition in the report, as in some tests of this type, surface defects can have a significant impact on mechanical strength (see Chapter 6).

Geometry, multi-axial loading, other rates of loading, or other environmental conditions should be treated with caution.

The fracture point provides guidance on the nature and location of strength-limiting defects (e.g., pores, large grains, and impurity enrichment).

The results of the strength test are affected by the following factors. the microstructure of the material, the surface treatment process of the test core, the size of the test core, size and shape, mechanical parameters of the test instrument, rate of load application, relative humidity of the ambient atmosphere.

The results obtained from testing a large number of cores with the same specifications are quite wide, so the test results should be adopted with caution.

Magnetic core machinery made of magnetic oxide Strength test method

1 Scope

This document describes the test methods for the mechanical strength of cores made of magnetic oxides.

This document is applicable to most E-type cores, ETD-type cores, I-type cores and toroidal cores. For other types of cores such as U-type cores, this document is also applicable to the mechanical strength test of metal powder cores.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to this document.

ISO 7500-2 Metallic materials - Verification of static uniaxial testing machines - Part 2: Verification of applied forces on tensile creep testing machines Note. GB/T 16825.2-2018 Inspection of static uniaxial testing machines Part 2: Inspection of applied force of tensile creep testing machines (ISO 7500-2.

2006, IDT)

3 Terms and definitions

The following terms and definitions apply to this document.

ISO and IEC maintain terminology databases for use in standards at the following addresses.

Mechanical strength

The maximum force recorded at the moment of fracture when the oxide core is subjected to bending stress.

4.1 Test core support and loading head

The test core shall be supported on freely movable rollers or on a flat support, depending on its size (see 6.2).

The tension rod or plane support should be made of hardened steel with a hardness of 40HRC~60HRC. The radius of the loading head and roller should be 2mm, the radius of the tensile rod's tensile head in contact with the magnetic core to be tested is 2mm. The loading head and tensile rod should be connected to the test and record Load device.

4.2 Test setup

The test apparatus shall be a mechanical testing machine capable of applying a force sufficient to break the test core on the loading head.