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

GB/T 37253-2018

**Test method for ionic conductivity of functional ceramics for
oxygen sensor**

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Foreword

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

This standard uses the redrafting method to modify the use of ISO 11894-1:2013 "fine ceramic ion conductivity test method Part 1. solid

Test of oxygen ion conductivity of bulk electrolytes.

This standard has more structural adjustments than ISO 11894-1:2013. This standard and ISO 11894-1 are listed in Appendix A.

2013 chapter number comparison list.

There are technical differences between this standard and ISO 11894-1:2013. The terms involved in these differences have been passed on the outside margins.

The vertical single line (|) of the position is indicated, and a list of the corresponding technical differences and their causes is given in Appendix B.

This standard also made the following editorial changes.

--- Standard Chinese name was changed to "Test method for functional ceramic ion conductivity of oxygen sensor", the English name was changed to "Test

Method for ionic conductivity of functional ceramics for oxygen sensor".

This standard was proposed by the China Building Materials Federation.

This standard is under the jurisdiction of the National Industrial Ceramics Standardization Technical Committee (SAC/TC194).

This standard was drafted. Shanghai Institute of Ceramics, Chinese Academy of Sciences, National Electronic Ceramics Product Quality Supervision and Inspection Center, Shanghai Huaxun

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1 Scope

This standard specifies the functional ceramic ion conductivity test for oxygen sensors using the AC 4-terminal method.

Terms and definitions, symbols, test equipment, specimens, tests and test reports.

This standard is applicable to functional ceramics for oxygen sensors with oxygen ion mobility higher than 0.99 and conductivity between 1S.m-1 and 1000S.m-1.

Porcelain and solid electrolytes.

2 Normative references

The following documents are indispensable for the application of this document. For dated references, only dated versions apply to this article.

Pieces. For undated references, the latest edition (including all amendments) applies to this document.

GB/T 1216 outer diameter micrometer

GB/T 21389 cursor, table and digital caliper

GB/T 25995 Fine ceramic density and apparent porosity test method (GB/T 25995-2010, ISO 18754.2003, MOD)

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Ion conductive ionicconduction

The ions carry charge conduction.

3.2

Electronic conduction electronicconduction

Electrons (or holes) carry charge conduction.

3.3

Ion migration number ionictransferencenumber

The ratio of ionic conductivity to total conductivity (total conductivity refers to the sum of ionic conductivity and electron or hole conductivity).

3.4

Oxygen ion conductor oxideionconductor

A solid electrolyte functional ceramic whose electrical conductivity is mainly determined by the ionic conductivity of oxygen ions.

3.5

AC 4-terminal method AC4-terminalmethod

A method of measuring conductivity using alternating current (AC). As shown in Figure 1, four electrodes were placed on the sample. Two called current terminals

The external electrode supplies alternating current to the sample. Two built-in electrodes, called voltage terminals, are used to measure the voltage. The conductivity depends on the application

Applied voltage, measured voltage and sample geometry.