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**NATIONAL STANDARD OF THE
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**Metallic powders - Determination of envelope-specific surface
area from measurements of the permeability to air of a powder
bed under steady-state flow conditions**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1. Structure and Drafting Rules of Standardization Documents"

Drafting.

This document is equivalent to ISO 10070:2019 "Determination of external specific surface by powder layer permeability test under steady flow conditions of metal powder"

product".

Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents.

1 Scope

This document specifies a method for measuring the air permeability and porosity of pressed metal powder layers and obtaining external specific surface area values. in steady state

Under flow conditions, laminar air flow is used to determine the permeability of the powder layer at a pressure close to atmospheric pressure. This document does not cover the use of constant volume

Method for measuring permeability. This document does not specify specific commercial equipment and corresponding test procedures. However, for the convenience of users, this article

The document contains informative appendices (see Appendix A) intended to provide some practical information on three specific methods. If there are agglomerates of powder

Like this, the measured external specific surface area results will be affected by the degree of agglomeration of the sample. If approved by the relevant parties, the agglomerated powder can be dispersed

(See Appendix B).

This document applies to all metal powders, including cemented carbide powders with a particle size not greater than 1000 μm , but is usually used for particles with a particle size of

Particles from 0.2 μm to 75 μm . With permission from the interested parties, this method can also be used for particles with poor axial symmetry (such as flakes and fibers).

This document does not apply to mixtures of different powders and powders containing binders or lubricants.

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text. Among them, the dated quotations

For undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to

this document.

Note. GB/T 5314-2011 Powder sampling method for powder metallurgy (ISO 3954:2007, IDT)

3 Terms and definitions

The following terms and definitions apply to this document.

3.1

Powder layer density envelopedensity

The ratio of the mass of the powder layer to the envelope volume (3.3).

Note. When the particles contain pores that are not conducive to airflow through the powder layer, the density of the powder layer may be less than the theoretical density.

3.2

Powder layer outer specific surface area envelope-specificsurfacearea

The external specific surface area of the powder measured by gas transmission method.

3.3

envelope volume envelopevolume

The volume occupied by powder particles in the powder layer excluding interstitial holes (3.5).

Note. In the gas permeation method, the envelope volume includes the volume of the solid

material plus all pores that are not conducive to gas flow (closed pores, blind pores, micropores, surface micropores, surface pores, etc.)

Surface roughness, etc.) volume. Since this volume cannot be measured by any known method, in this document the volume is equal to that determined using the hydrometry method.

Effective volume.

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