SVENSK STANDARD
SS-EN ISO 22068:2014

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Formsprutade sintermetaller – Specifikationer (ISO 22068:2012)

Sintered-metal injection-moulded materials – Specifications (ISO 22068:2012)

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Europastandarden EN ISO 22068:2014 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 22068:2014.

Denna standard ersätter SS-ISO 22068:2012, utgåva 1.

The European Standard EN ISO 22068:2014 has the status of a Swedish Standard. This document contains the official version of EN ISO 22068:2014.

This standard supersedes the Swedish Standard SS-ISO 22068:2012, edition 1.

Upplysningar om sakinnehållet i standarden lämnas av SIS, Swedish Standards Institute, telefon 08-555 520 00. Standarder kan beställas hos SIS Förlag AB som även lämnar allmänna upplysningar om svensk och utländsk standard.

Information about the content of the standard is available from the Swedish Standards Institute (SIS), telephone +46 8 555 520 00. Standards may be ordered from SIS Förlag AB, who can also provide general information about Swedish and foreign standards.

Denna standard är framtagen av kommittén för Pulvermetallurgi, SIS/TK 133.

Har du synpunkter på innehållet i den här standarden, vill du delta i ett kommande revideringsarbete eller vara med och ta fram andra standarder inom området? Gå in på www.sis.se - där hittar du mer information.

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 22068

March 2014

ICS 77.160

English Version

Sintered-metal injection-moulded materials - Specifications (ISO 22068:2012)

Matériaux métalliques frittés pour moulage par injection - Spécifications (ISO 22068:2012)

Sintermetallpulverspritzguss - Anforderungen (ISO 22068:2012)

This European Standard was approved by CEN on 2 March 2014.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

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Foreword

The text of ISO 22068:2012 has been prepared by Technical Committee ISO/TC 119 “Powder metallurgy” of the International Organization for Standardization (ISO) and has been taken over as EN ISO 22068:2014.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2014, and conflicting national standards shall be withdrawn at the latest by September 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 22068:2012 has been approved by CEN as EN ISO 22068:2014 without any modification.

Sintered-metal injection-moulded materials — Specifications

1 Scope

This International Standard specifies the requirements for the chemical composition and the mechanical and physical properties of sintered-metal injection-moulded materials.

It is intended to provide design and materials engineers with necessary information for specifying materials in components manufactured by means of the Metal Injection Moulding (MIM) process only.

It does not apply to structural parts manufactured by other powder metallurgy routes, such as press-and-sinter or powder-forging technologies.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 2740, *Sintered materials, excluding hardmetals — Tensile test pieces*

ISO 3369, *Impermeable sintered metal materials and hardmetals — Determination of density*

ISO 4498, *Sintered metal materials, excluding hardmetals — Determination of apparent hardness and micro-hardness*

ISO 6507-1, *Metallic materials — Vickers hardness test — Part 1: Test method*

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method (scales, A, B, C, E, F, G, H, K, N, T)*

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 9227, *Corrosion tests in artificial atmospheres — Salt spray tests*

IEC 60404-4, *Magnetic materials — Part 4: Methods of measurement of d.c. magnetic properties of magnetically soft materials*

ASTM D2638, Standard Test Method for *Real Density of Calcined Petroleum Coke by Helium Pycnometer*

ASTM D4892, *Standard Test Method for Density of Solid Pitch (Helium Pycnometer Method)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
tensile strength
R_m
ability of a test specimen to resist fracture when a pulling force is applied in a direction parallel to its longitudinal axis, expressed in MPa

3.2
tensile yield strength
$R_{p0,2}$
load at which the material exhibits a 0,2 % offset from proportionality on a stress-strain curve in tension, divided by the original cross-sectional area, expressed in MPa

3.3
elongation
A_{25}
plastic elongation, expressed as a percentage of the original gauge length of the specimen

NOTE The elastic strain at the 0,2 % yield strength must be subtracted from the total elongation to give the plastic elongation.

3.4
density
mass per unit volume of the material, expressed in g/cm^3

3.5
hardness
resistance of a PM material to indentation, tested under specified conditions

4 Test methods for normative properties

4.1 General

The following test methods shall be used to determine the normative properties given in Tables 1 to 6.

4.2 Chemical composition

Whenever possible, and always in cases of dispute, the methods of chemical analysis shall be those specified in the relevant International Standards. If no International Standard is available, the method may be agreed upon and specified at the time of enquiry and order.

4.3 Density

The density shall be determined in accordance with ISO 3369 or by gas pycnometer measurement in accordance with ASTM D2638 or ASTM D4892 as stipulated at the time of enquiry and order.

4.4 Tensile strength

The ultimate tensile strength shall be determined in accordance with ISO 2740 and ISO 6892-1.

4.5 Tensile yield strength

The tensile yield strength shall be determined in accordance with ISO 2740 and ISO 6892-1.

4.6 Elongation

The elongation shall be determined in accordance with ISO 2740 and ISO 6892-1.

4.7 Magnetic properties

The maximum permeability and magnetic induction at an applied field of 1 990 A/m (25 Oe) shall be determined in accordance with IEC 60404-4.

5 Other test methods

5.1 Hardness

The hardness shall be determined in accordance with ISO 4498, ISO 6507-1 and ISO 6508-1.

5.2 Corrosion resistance

Four corrosive media and test methods (see 5.2.1 to 5.2.4) are used to rate the corrosion resistance of MIM stainless-steel alloys.

5.2.1 Sulfuric acid test

The standard un-notched Charpy test specimens (10 mm × 5 mm × 55 mm) are immersed in a 2 % by mass sulfuric acid solution at room temperature for 1 000 h. Three replicates are tested. The loss in mass for each is determined in accordance with MPIF Standard 62, and then converted into mass loss per surface area per day in units of gram per square decimetre day [g/(dm^2)(day)].

5.2.2 Copper sulfate test

The test specimens or test parts are immersed in a copper sulfate solution (dissolve 1 g of cupric sulfate crystals in a mixture of 22,5 ml of distilled water and 2,5 g of sulfuric acid) for 6 min (± 30 s) at a temperature of 17 to 20 °C. Specimens that show no sign of copper plating are classified as passing this test (see ASTM F1089).

5.2.3 Boiling water test

The test specimen or test parts are immersed in distilled water, then brought to a boil and held for (30 ± 1) min. After the 30 min exposure remove from the heat source and let the specimens remain in the water for 3 h ± 15 min. The specimens are then removed and left to dry in still air for 2 h ± 10 min. Specimens that show no visible corrosion are classified as passing this test (see ASTM F1089).

5.2.4 Salt spray test

Criteria for the salt spray test in accordance with ISO 9227 shall be determined between the manufacturer and the customer.