SVENSK STANDARD
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Hårdmetall – Bestämning av totalt kolinnehåll – Gravimetrisk metod (ISO 3907:2009)

Hardmetals – Determination of total carbon – Gravimetric method (ISO 3907:2009)

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Europastandarden EN ISO 3907:2009 gäller som svensk standard. Detta dokument innehåller den officiella engelska versionen av EN ISO 3907:2009.

Denna standard ersätter SS-EN 23907, utgåva 1.

I denna korrigerade version är den saknade formeln under punkt 7.1 tillagd.

The European Standard EN ISO 3907:2009 has the status of a Swedish Standard. This document contains the official English version of EN ISO 3907:2009.

This standard supersedes the Swedish Standard SS-EN 23907, edition 1.

In this corrected version, the missing equation in 7.1 has been added.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

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English Version

Hardmetals - Determination of total carbon - Gravimetric method (ISO 3907:2009)

Métaux-durs - Dosage du carbone total - Méthode gravimétrique (ISO 3907:2009)

Hartmetalle - Bestimmung des Gesamtkohlenstoff-Gehaltes - Gravimetrisches Verfahren (ISO 3907:2009)

This European Standard was approved by CEN on 29 September 2009.

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

Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN ISO 3907:2009: E

Foreword

This document (EN ISO 3907:2009) has been prepared by Technical Committee ISO/TC 119 "Powder metallurgy".

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of an identical text or by endorsement, at the latest by April 2010, and conflicting national standards shall be withdrawn at the latest by April 2010.

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Endorsement notice

The text of ISO 3907:2009 has been approved by CEN as a EN ISO 3907:2009 without any modification.

Hardmetals — Determination of total carbon — Gravimetric method

1 Scope

This International Standard specifies a gravimetric method for the determination of the mass fraction of total carbon in carbides and hardmetals.

This method is applicable to

— carbides of chromium, hafnium, molybdenum, niobium, tantalum, titanium, vanadium, tungsten and zirconium,

— mixtures of these carbides and binder metals, free of lubricant,

— all grade of presintered or sintered hardmetals, produced from these carbides, and

having a mass fraction of total carbon exceeding 4 %.

2 Principle

Oxidation of carbon to carbon dioxide at a high temperature in a stream of pure oxygen, with the addition of a flux, if necessary.

Absorption of the carbon dioxide, carried by oxygen, by Ascarite[1)] in a tared bulb. Determination of the increase in mass of the Ascarite[1)] which corresponds to the quantity of carbon dioxide formed.

$$C + O_2 \rightarrow CO_2$$

$$2\,NaOH + CO_2 \rightarrow Na_2CO_3 + H_2O$$

3 Reagents

During the analysis, use only reagents of recognized analytical grade, and only distilled water or water of equivalent purity.

3.1 Oxygen, with a limitation of carbon-containing impurities of $\leqslant$ 0,6 ml of carbon per cubic metre of oxygen.

1) Ascarite is the trade name of a product supplied by Arthur H. Thomas Co. This information is given for the convenience of users of the International Standard and does not constitute an endorsement by ISO of the product named. Equivalent products may be used if they can be shown to lead to the same results.

3.2 Magnesium perchlorate, anhydrous.

CAUTION — To prevent the possibility of explosion, contact of this reagent with organic materials must be avoided, especially when discarding it.

3.3 Flux, for example tin metal, copper metal or oxide, iron metal.

3.4 Ascarite[1)].

4 Apparatus

Ordinary laboratory apparatus and the following.

4.1 Apparatus, consisting of an electric furnace with a combustion tube, a purification train and a system to absorb carbon dioxide. If it is necessary to obtain oxygen of adequate purity, an oxygen purification train may also be used.

Successive parts of the apparatus shall be joined together with connecting tubes forming an airtight seal.

The apparatus is shown schematically in Figure 1.

4.1.1 Source of oxygen (3.1), with a pressure-regulating valve.

4.1.2 Flow meter.

4.1.3 Electric furnace, capable of operation at up to 1 350 °C, with a suitable device for temperature control.

4.1.4 Combustion tube, made of a non-porous refractory material. The internal diameter of the tube should be 18 mm to 30 mm and its length should be at least 650 mm, so that the ends of the tube do not reach a temperature higher than 60 °C during the operation.

4.1.5 Boat, made of a refractory material, pretreated in an oxygen stream at the test temperature for 10 min or alternatively at 800 °C to 1 000 °C for 1 h.

The boat shall be of suitable dimensions, for example of length 80 mm to 100 mm, width 12 mm to 14 mm and depth 8 mm to 9 mm.

The pretreated boats shall be kept in a desiccator. The ground surfaces of the desiccator and its lid shall not be greased.

4.1.6 Plug of silica wool.

4.1.7 Drying bulb, containing anhydrous magnesium perchlorate (3.2).

4.1.8 Absorption bulbs, containing Ascarite[1)] (3.4) and a small amount of anhydrous magnesium perchlorate (3.2).

An example of an absorption bulb is shown in Figure 2.

4.1.9 Additional absorption bulb, facing the opposite way to the absorption bulb in 4.1.8 (see Figure 1, item reference 8) to avoid introduction of carbon dioxide and moisture from the air.

4.2 Hook, made from heat-resisting metal wire with a mass fraction of carbon less than 0,05 %. Its diameter should be approximately 3 mm and its length should be 500 mm to 600 mm.