
INTERNATIONAL STANDARD



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Sintered ferrous materials, carburized or carbonitrided — Determination and verification of effective case depth by the Vickers microhardness testing method

Matériaux ferreux frittés, cémentés ou carbonitrurés — Détermination et vérification de la profondeur effective de cémentation par mesurage de la microdureté Vickers

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FOREWORD

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 4507 was developed by Technical Committee ISO/TC 119, *Powder metallurgical materials and products*, and was circulated to the member bodies in June 1977.

It has been approved by the member bodies of the following countries :

Australia	Ireland	Spain
Austria	Italy	Sweden
Bulgaria	Korea, Rep. of	United Kingdom
Canada	Mexico	U.S.A.
Chile	Poland	U.S.S.R.
Czechoslovakia	Portugal	Yugoslavia
France	Romania	
Germany	South Africa, Rep. of	

No member body expressed disapproval of the document.

Sintered ferrous materials, carburized or carbonitrided — Determination and verification of effective case depth by the Vickers microhardness testing method

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies methods for determining the effective case depth of carburized or carbonitrided sintered ferrous materials by Vickers microhardness measurement.

The methods are adapted to have particular regard for materials having porosity.

This method does not apply to unquenched materials.

2 REFERENCES

ISO/R 81, *Vickers hardness test for steel*.

ISO 2639, *Steel — Determination and verification of the effective depth of carburized and hardened cases*.

3 DEFINITIONS

3.1 effective case depth, DC: The distance, measured normal to the surface, at which the hardness falls below a specified level.

3.2 total case depth¹⁾: The distance, measured normal to the surface, at which the hardness falls to the core hardness level.

4 PRINCIPLE

Measurement of the Vickers microhardness, in principle in accordance with ISO/R 81.

Graphical determination of the case depth from the curve representing the variations of this hardness, on a section taken normal to the surface, as a function of distance from the surface of the piece.

The effective case depth is read off from this curve at the point corresponding to a specified Vickers hardness, usually HV 0,1 = 550. By agreement between the parties concerned, another value (HG) may be specified.

This basic method A may be simplified for rapid spot checking (method B). In method B, the hardness is measured at two points situated at either side of the approximate case depth. The accurate effective case depth is then obtained by interpolation.

5 APPARATUS

5.1 Vickers microhardness testing machine capable of applying a predetermined load of 0,980 7 N (HV 0,1) with an accuracy of $\pm 1\%$.

5.2 Measuring instrument capable of measuring the diagonals of the indentation to an accuracy of $\pm 0,5\ \mu\text{m}$.

6 PROCEDURE

Microhardness measurements shall be made on a section of the sintered piece cut at right angles to the surface in an area chosen by agreement between supplier and user.

The test shall be made with a Vickers diamond indenter.

The test load used is 0,980 7 N (HV 0,1).

6.1 Preparation of sample

The surface on which the measurement is to be made shall be polished to a smoothness sufficient to permit correct measurements of the microhardness indentation. All precautions shall be taken to avoid damage to the edges of the specimen, overheating and changes of the surface due to smearing of the pores.

NOTE — The preparation of the sample may be facilitated when it is impregnated with a thermosetting plastic.

6.2 Method A — Determination of effective case depth

6.2.1 Position of microhardness impressions (see figure 1)

For each depth d_1 , d_2 , d_3 , etc., make at least three impressions.

1) The determination of total case depth is not within the scope of this International Standard.