UDC 669.3 : 620.17

Ref. No.: ISO / R 399 - 1964 (E)

ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO 6507/1

ISO RECOMMENDATION

R 399

VICKERS HARDNESS TEST FOR COPPER AND COPPER ALLOYS

(Test loads from 2.5 to 50 kgf)

1st EDITION

November 1964

For each individual country the only valid standard is the national standard of that country.

Printed in Switzerland

Also issued in French and Russian. Copies to be obtained through the national standards organizations.

BRIEF HISTORY

The ISO Recommendation R 399, *Vickers Hardness Test for Copper and Copper Alloys* (test loads from 2.5 to 50 kgf), was drawn up by Technical Committee ISO/TC 26, *Copper and Copper Alloys*, the Secretariat of which is held by the Deutscher Normenausschuss (DNA).

Work on this question by the Technical Committee began in 1958 and led, in 1961, to the adoption of a Draft ISO Recommendation.

In February 1962, this Draft ISO Recommendation (No. 497) was circulated to all the ISO Member Bodies for enquiry. It was approved by the following Member Bodies:

Australia	India	Spain
Bulgaria	Italy	Sweden
Burma	Japan	Switzerland
Canada	Netherlands	Turkey
Denmark	Poland	United Kingdom
Finland	Portugal	U.S.S.R.
France	Republic of South Africa	Yugoslavia
Germany		

Two Member Bodies opposed the approval of the Draft:

Belgium, U.S.A.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in November 1964, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 399 November 1964

VICKERS HARDNESS TEST FOR COPPER AND COPPER ALLOYS

(Test loads from 2.5 to 50 kgf)

1. SCOPE

This ISO Recommendation applies to the Vickers hardness test for copper and copper alloys using test loads within the range 2.5 to 50 kgf.

2. PRINCIPLE OF TEST

An indenter in the form of a right pyramid with a square base and specified angle between opposite faces at the vertex is forced into the metal under a load F. The diagonal d of the indentation left in the surface of the piece to be tested, after removal of the load, is measured.

The Vickers hardness is the ratio of the test load F (expressed in kilogrammes-force) divided by the sloping area (expressed in square millimetres) of the indentation, considered as a right pyramid with a square base, of diagonal d, and having at the vertex the same angle as the indenter.

The test is carried out at ambient temperature, unless otherwise specified.

3. SYMBOLS AND DESIGNATIONS

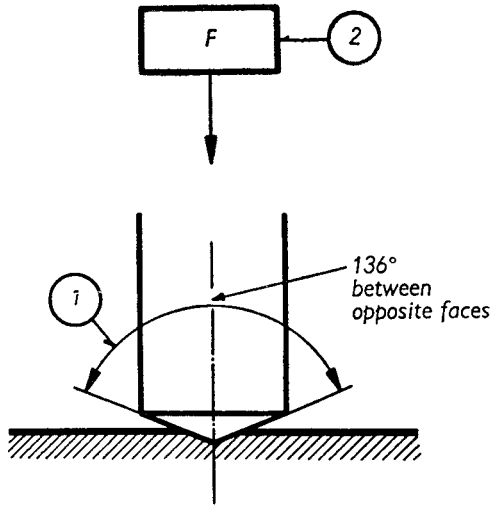

FIG. 1

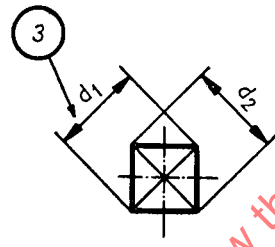

FIG. 2

Number	Symbol	Designation
1	—	Angle between opposite faces of the indenter (136°)
2	F	Test load, in kilogrammes-force
3	d	Arithmetic mean of the two diagonals d_1 and d_2 in mm
4	HV	Vickers hardness $= \dfrac{\text{test load in kgf}}{\text{area of indentation in mm}^2}$ $= \dfrac{2\,F \sin \dfrac{136°}{2}}{d^2} = 1.854\,\dfrac{F}{d^2}$ (approx.)

NOTE

The symbol HV is supplemented by an index indicating the load and the duration of loading when the latter differs from the normal time.

Example: HV 10 = Vickers hardness measured under a load of 10 kgf, applied for 10 to 15 seconds;
HV 5/30 = Vickers hardness measured under a load of 5 kgf, applied for 30 seconds.