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**Metallic materials — Brinell hardness  
test —**

**Part 4:  
Table of hardness values**

*Matériaux métalliques — Essai de dureté Brinell —*

*Partie 4: Tableau des valeurs de dureté*

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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 164, *Mechanical testing of metals*, Subcommittee SC 3, *Hardness testing*.

This second edition cancels and replaces the first edition (ISO 6506-4:2005), which has been technically revised.

ISO 6506 consists of the following parts, under the general title *Metallic materials — Brinell hardness test*:

- *Part 1: Test method*
- *Part 2: Verification and calibration of testing machines*
- *Part 3: Calibration of reference blocks*
- *Part 4: Table of hardness values*

# Metallic materials — Brinell hardness test —

## Part 4: Table of hardness values

### 1 Scope

This part of ISO 6506 gives a table of the Brinell hardness values for use in tests on flat surfaces.

### 2 Determination of the Brinell hardness for testing on flat surfaces

See [Tables 1](#) and [2](#). Where the measured indentation diameter value is not given in the table, a linear interpolation between the two adjacent values and between the two corresponding hardness values should be carried out. Each hardness value is quoted to three significant figures, but is calculated from the nominal force-diameter index rather than from the specified force value, in order to avoid variations in the hardness values calculated at a specific force-diameter index. In some cases, this calculation method leads to an error of one digit in the least significant figure.

Table 1

| Ball indenter<br><i>D</i><br>mm | Force-diameter index<br>$0,102 \times F/D^2$ |          |          |          |          |         |
|---------------------------------|--|----------|----------|----------|----------|---------|
|                                 | 30   | 15       | 10       | 5        | 2,5      | 1       |
|                                 | Test force<br><i>F</i>                       |          |          |          |          |         |
| 10                              | 29,42 kN                                     | 14,71 kN | 9,807 kN | 4,903 kN | 2,452 kN | 980,7 N |
| 5                               | 7,355 kN                                     | --       | 2,452 kN | 1,226 kN | 612,9 N  | 245,2 N |
| 2,5                             | 1,839 kN                                     | --       | 612,9 N  | 306,5 N  | 153,2 N  | 61,29 N |
| 1                               | 294,2 N                                      | --       | 98,07 N  | 49,03 N  | 24,52 N  | 9,807 N |

Table 2

| Ball indenter<br><i>D</i><br>mm                    |       |         |       | Force-diameter index<br>$0,102 \times F/D^2$ |     |     |     |      |      |
|--|-------|---------|-------|--|-----|-----|-----|------|------|
| 10   | 5     | 2,5     | 1     | 30   | 15  | 10  | 5   | 2,5  | 1    |
| Mean diameter of the indentation<br><i>d</i><br>mm |       |         |       | Brinell hardness<br>HBW                      |     |     |     |      |      |
| 2,40   | 1,200 | 0,600 0 | 0,240 | 653  | 327 | 218 | 109 | 54,5 | 21,8 |
| 2,41   | 1,205 | 0,602 5 | 0,241 | 648  | 324 | 216 | 108 | 54,0 | 21,6 |
| 2,42   | 1,210 | 0,605 0 | 0,242 | 643  | 321 | 214 | 107 | 53,5 | 21,4 |
| 2,43   | 1,215 | 0,607 5 | 0,243 | 637  | 319 | 212 | 106 | 53,1 | 21,2 |
| 2,44   | 1,220 | 0,610 0 | 0,244 | 632  | 316 | 211 | 105 | 52,7 | 21,1 |
| 2,45   | 1,225 | 0,612 5 | 0,245 | 627  | 313 | 209 | 104 | 52,2 | 20,9 |
| 2,46   | 1,230 | 0,615 0 | 0,246 | 621  | 311 | 207 | 104 | 51,8 | 20,7 |

Table 2

| Ball indenter<br>$D$<br>mm                    |       |         |       | Force-diameter index<br>$0,102 \times F/D^2$ |     |     |      |      |      |
|---|-------|---------|-------|--|-----|-----|------|------|------|
| 10  | 5     | 2,5     | 1     | 30   | 15  | 10  | 5    | 2,5  | 1    |
| Mean diameter of the indentation<br>$d$<br>mm |       |         |       | Brinell hardness<br>HBW                      |     |     |      |      |      |
| 2,47  | 1,235 | 0,617 5 | 0,247 | 616  | 308 | 205 | 103  | 51,4 | 20,5 |
| 2,48  | 1,240 | 0,620 0 | 0,248 | 611  | 306 | 204 | 102  | 50,9 | 20,4 |
| 2,49  | 1,245 | 0,622 5 | 0,249 | 606  | 303 | 202 | 101  | 50,5 | 20,2 |
| 2,50  | 1,250 | 0,625 0 | 0,250 | 601  | 301 | 200 | 100  | 50,1 | 20,0 |
| 2,51  | 1,255 | 0,627 5 | 0,251 | 597  | 298 | 199 | 99,4 | 49,7 | 19,9 |
| 2,52  | 1,260 | 0,630 0 | 0,252 | 592  | 296 | 197 | 98,6 | 49,3 | 19,7 |
| 2,53  | 1,265 | 0,632 5 | 0,253 | 587  | 294 | 196 | 97,8 | 48,9 | 19,6 |
| 2,54  | 1,270 | 0,635 0 | 0,254 | 582  | 291 | 194 | 97,1 | 48,5 | 19,4 |
| 2,55  | 1,275 | 0,637 5 | 0,255 | 578  | 289 | 193 | 96,3 | 48,1 | 19,3 |
| 2,56  | 1,280 | 0,640 0 | 0,256 | 573  | 287 | 191 | 95,5 | 47,8 | 19,1 |
| 2,57  | 1,285 | 0,642 5 | 0,257 | 569  | 284 | 190 | 94,8 | 47,4 | 19,0 |
| 2,58  | 1,290 | 0,645 0 | 0,258 | 564  | 282 | 188 | 94,0 | 47,0 | 18,8 |
| 2,59  | 1,295 | 0,647 5 | 0,259 | 560  | 280 | 187 | 93,3 | 46,6 | 18,7 |
| 2,60  | 1,300 | 0,650 0 | 0,260 | 555  | 278 | 185 | 92,6 | 46,3 | 18,5 |
| 2,61  | 1,305 | 0,652 5 | 0,261 | 551  | 276 | 184 | 91,8 | 45,9 | 18,4 |
| 2,62  | 1,310 | 0,655 0 | 0,262 | 547  | 273 | 182 | 91,1 | 45,6 | 18,2 |
| 2,63  | 1,315 | 0,657 5 | 0,263 | 543  | 271 | 181 | 90,4 | 45,2 | 18,1 |
| 2,64  | 1,320 | 0,660 0 | 0,264 | 538  | 269 | 179 | 89,7 | 44,9 | 17,9 |
| 2,65  | 1,325 | 0,662 5 | 0,265 | 534  | 267 | 178 | 89,0 | 44,5 | 17,8 |
| 2,66  | 1,330 | 0,665 0 | 0,266 | 530  | 265 | 177 | 88,4 | 44,2 | 17,7 |
| 2,67  | 1,335 | 0,667 5 | 0,267 | 526  | 263 | 175 | 87,7 | 43,8 | 17,5 |
| 2,68  | 1,340 | 0,670 0 | 0,268 | 522  | 261 | 174 | 87,0 | 43,5 | 17,4 |
| 2,69  | 1,345 | 0,672 5 | 0,269 | 518  | 259 | 173 | 86,4 | 43,2 | 17,3 |
| 2,70  | 1,350 | 0,675 0 | 0,270 | 514  | 257 | 171 | 85,7 | 42,9 | 17,1 |
| 2,71  | 1,355 | 0,677 5 | 0,271 | 510  | 255 | 170 | 85,1 | 42,5 | 17,0 |
| 2,72  | 1,360 | 0,680 0 | 0,272 | 507  | 253 | 169 | 84,4 | 42,2 | 16,9 |
| 2,73  | 1,365 | 0,682 5 | 0,273 | 503  | 251 | 168 | 83,8 | 41,9 | 16,8 |
| 2,74  | 1,370 | 0,685 0 | 0,274 | 499  | 250 | 166 | 83,2 | 41,6 | 16,6 |
| 2,75  | 1,375 | 0,687 5 | 0,275 | 495  | 248 | 165 | 82,6 | 41,3 | 16,5 |
| 2,76  | 1,380 | 0,690 0 | 0,276 | 492  | 246 | 164 | 81,9 | 41,0 | 16,4 |
| 2,77  | 1,385 | 0,692 5 | 0,277 | 488  | 244 | 163 | 81,3 | 40,7 | 16,3 |
| 2,78  | 1,390 | 0,695 0 | 0,278 | 485  | 242 | 162 | 80,8 | 40,4 | 16,2 |
| 2,79  | 1,395 | 0,697 5 | 0,279 | 481  | 240 | 160 | 80,2 | 40,1 | 16,0 |
| 2,80  | 1,400 | 0,700 0 | 0,280 | 477  | 239 | 159 | 79,6 | 39,8 | 15,9 |
| 2,81  | 1,405 | 0,702 5 | 0,281 | 474  | 237 | 158 | 79,0 | 39,5 | 15,8 |
| 2,82  | 1,410 | 0,705 0 | 0,282 | 471  | 235 | 157 | 78,4 | 39,2 | 15,7 |