
Vickers Hardness Test - Test Method

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Vickers Hardness Test - Test Method

Introduction

This Standard has been prepared based on the third edition of **ISO 6507-1** and the first edition of **ISO 6507-4** published in 2005 with some modifications of the technical contents. The portions given dotted underlines are the matters in which the contents of the corresponding International Standards have been modified.

1 Scope

This Standard specifies the Vickers hardness test method, for the three different ranges of test force for metallic materials (see table 1).

Table 1 Ranges of test force

Ranges of test force, F N	Hardness symbol	Designation
$F \geq 49.03$	$\geq HV 5$	Vickers hardness test
$1.961 \leq F < 49.03$	HV 0.2 to $< HV 5$	Low force Vickers hardness test
$0.098 07 \leq F < 1.961$	HV 0.01 to $< HV 0.2$	Vickers microhardness test

The Vickers hardness test is specified in this Standard for lengths of indentation diagonals between 0.020 mm and 1.400 mm. The Vickers hardness test for lengths of indentation diagonals less than 0.020 mm and the test force of less than 98.07 mN however, may be in accordance with this Standard upon the agreement between the purchaser and the supplier.

For specific materials and/or products, particular Japanese Industrial Standards exist.

NOTE 1: For indentation diagonals less than 0.020 mm, the increase of the uncertainty has to be considered.

2: In general, decreasing the test force increases the scatter of results of the measurements. This is particularly true for low-force Vickers hardness tests and Vickers microhardness tests, where the principal limitation will arise in the measurement of the diagonals of the indentation. For Vickers microhardness, the accuracy of determination of the mean diagonal length is unlikely to be better than ± 0.001 mm.

3: The International Standards corresponding to this Standard is as follows.

ISO 6507-1: 2005 Metallic materials - Vickers hardness test

Part 1: Test Method

ISO 6507-4: 2005 Metallic materials-Vickers hardness test

Part 4: Tables of hardness values

(Overall evaluation: MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standards and JIS are IDT (identical), MOD (modified), and NEQ (not equivalent) according to ISO/IEC Guide 21

2 Normative references

The following standard contains provisions which, through reference in this text, constitute provisions of this Standard. The most recent edition of the standard (including amendments) indicated below shall be applied.

JIS B7725 Vickers hardness test- Verification of testing machines. NOTE: At the time of revision of this Standard, JIS B 7725 corresponded to ISO. 6507-2:1997, however, ISO 6507-2 has already been revised and published as 2005 version.

3 Principle

A diamond indenter, in the form of a right pyramid with a square base and with a specified angle between opposite faces at the vertex, is forced into the surface of a test piece followed by measurement of the diagonal length of the indentation left in the surface after removal of the test force, F (see figure 1).

The Vickers hardness is proportional to the quotient obtained by dividing the test force by the sloping area of the indentation, which is assumed to be a right pyramid with a square base, and having at the vertex the same angle as the indenter.

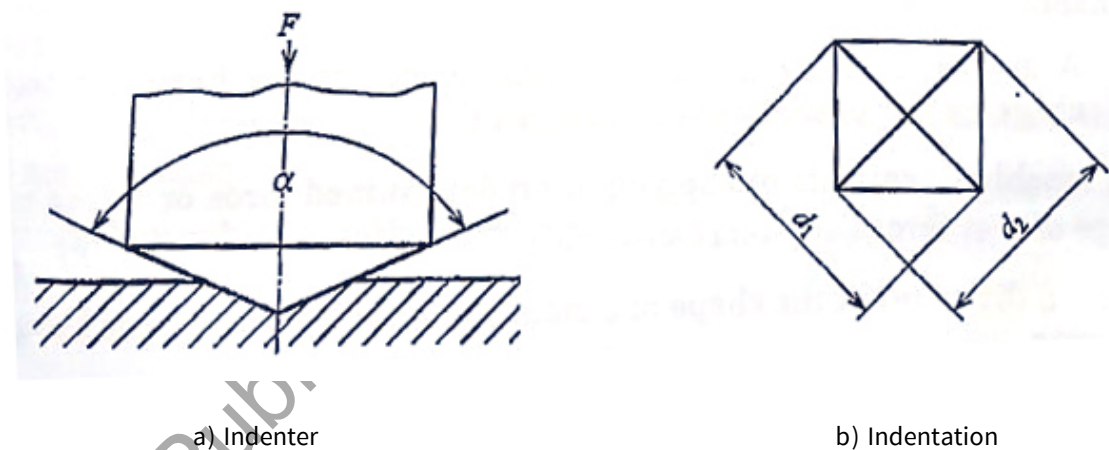


Figure 1 Principle of the test

4 Symbols and designation of hardness

4.1 Symbols and designation thereof

See table 2 and figure 1.

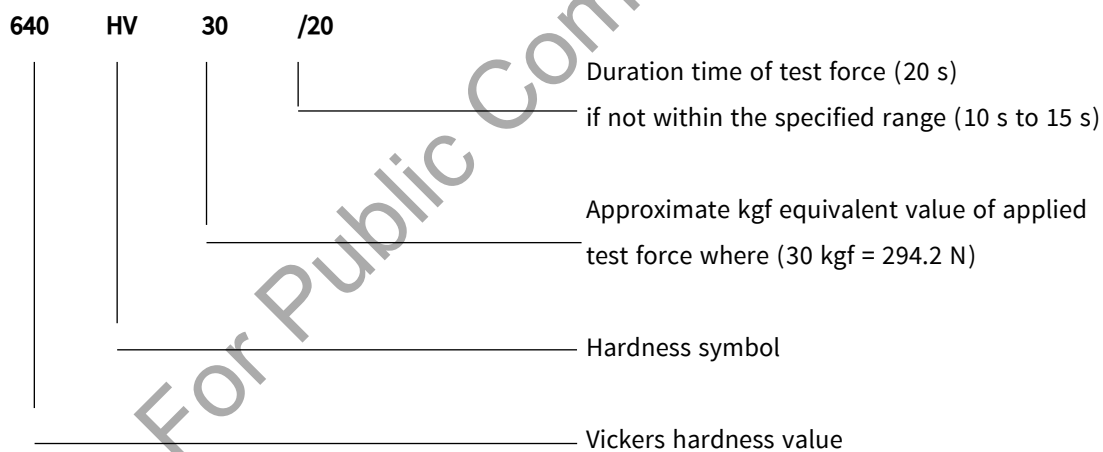
Table 2 Symbols and designations thereof

Symbol	Designation
α	Angle between the opposite faces at the vertex of the pyramidal indenter (136°)
F	Test force, in newtons (N)
d	Arithmetic mean, in millimetres, of the two-diagonal length d_1 and d_2 of the indentation (see figure 1)
HV	<p>Vickers hardness = Constant \times $\frac{\text{Test force}}{\text{Surface area of indentation}}$</p> $= 0.102 \frac{2F \sin \frac{136^\circ}{2}}{d^2} = 0.189 \frac{F}{d^2}$
NOTE: Constant = 0.102 \approx 1/9.806 65, where 9.806 65 is the conversion factor from kgf to N.	

4.2 Designation of Vickers hardness

The following is an example of the designation of Vickers hardness HV.

Example



5 Testing machine

NOTE: A suggested procedure for periodic checks of the hardness testing machine by the users is given in Annex C.

5.1 Testing machine capable of applying a predetermined force or forces within the required range of test forces, in accordance with **JIS B 7725**.

5.2 Indenter a diamond in the shape of a right pyramid with a square base, as specified in **JIS B 7725**.

5.3 **Measuring system as specified in JIS B 7725.**

6 Test piece

The test piece shall be as follows.

a) The test shall be carried out on a surface which is smooth and even, free from oxide scale, foreign matter and, in particular, completely free from lubricants, unless otherwise specified in product standards. The finish of the surface shall permit accurate determination of the diagonal length of the indentation.

b) Preparation shall be carried out in such a way that any alteration of the surface hardness, due to excessive heating or cold-working, for example, is minimized.

Due to the small depth of Vickers microhardness indentations, it is essential that special precautions are taken during preparation. It is recommended to use a polishing/ electropolishing process which is suitable for the material parameters.

c) The thickness of the test piece, or of the layer under test, shall be at least 1.5 times the diagonal length of the indentation (see Annex A).

No deformation shall be visible at the back of the test piece after the test.

d) For tests on curved surfaces, the corrections given in Annex B, tables B.1 to B.6 shall be applied.

e) For test pieces of small cross-section or of irregular shape, it may be necessary to provide some form of additional support.

NOTE: In the preparation and testing of the test piece of small dimension or of complicated shape, it is recommended to hold it by using particular holders or by embedding it in resin. However, the method employed shall not affect the hardness of the test piece. When embedding the test piece in resin, care shall be taken because the heat generation along with hardening of resin, and pressure and temperature during press forming may affect the hardness of the test piece.

7 Procedure

The procedure shall be as follows.

a) In general, the test is carried out at ambient temperature within the limits of 10 °C to 35 °C. Tests carried out under controlled conditions shall be made at a temperature of (23 ± 5) °C.

b) The test forces given in table 3 shall be used. Other test forces than that given in table 3 may be used.

NOTE: Other values, HV 2.5 (24.52 N) may be used.

Table 3 Test forces

Hardness test ^{a)}		Low-force hardness test		Microhardness test	
Hardness symbol	Nominal value of the test force F N	Hardness symbol	Nominal value of the test force F N	Hardness symbol	Nominal value of the test force F
HV5	49.03	HV0.2	1.961	HV0.01	0.098 07
HV10	98.07	HV0.3	2.942	HV0.015	0.147 1
HV20	196.1	HV0.5	4.903	HV0.02	0.196 1
HV30	294.2	HV1	9.807	HV0.025	0.245 2
HV50	490.3	HV2	19.61	HV0,03	0.294 2
HV100	980.7	HV3	29.42	HV0.05	0.490 3
				HV0.1	0.980 7
Note ^{a)} Nominal test forces greater than 980.7 N may be applied.					

- c) The test piece shall be placed on a rigid support. The support surfaces shall be clean and free from foreign matter (scale, oil, dirt, etc.). It is important that the test piece lies firmly on the support so that displacement cannot occur during the test.
- d) Bring the indenter into contact with the test surface and apply the test force in a direction perpendicular to the surface, without shock or vibration, until the applied force attains the specified value. The time from the initial application of the force until the full test force is reached shall not be less than 2 s nor greater than 8 s. For low-force hardness and microhardness tests, the maximum time shall not exceed 10 s. For low-force hardness and microhardness tests, the approach speed of the indenter shall not exceed 0.2 mm/s.
- For micro-hardness tests, the indenter should contact the test piece at a velocity between 15 $\mu\text{m/s}$ and 70 $\mu\text{m/s}$.
- ~~In the case where appropriate condition is recommended to the testing machine, that condition may be subjected.~~
- The duration of the test force shall be 10 s to 15 s, except for tests on materials whose time-dependent properties would make this an unsuitable range. For these tests, a longer duration is permitted and this duration shall be specified as part of the hardness designation (see Example in 4.2).
- e) Throughout the test, the testing machine shall be protected from shock or vibration.
- f) The distance between the centres of two adjacent indications and between any indentation and the edge of the test piece shall be the ratio to the mean diagonal length of the indication d specified in table 4.

Table 4 Position of indentation

Material of test piece	Steel, nickel alloy, titanium alloy, copper and copper alloy	Light metal (except for titanium alloy), lead, tin and their alloys
The distance between the centres of two adjacent indications ^{a)}	At least 3 <i>d</i>	At least 6 <i>d</i>
The distance between the centre of any indentation and the edge of test piece	At least 2.5 <i>d</i>	At least 3 <i>d</i>
Note ^{a)} If two adjacent indentations differ in size, the spacing <i>d</i> shall be based on the mean diagonal length of the larger indentation.		

- g) Measure the lengths of the two diagonals. The arithmetical mean of the two readings shall be taken for the calculation of the Vickers hardness.
- For flat surfaces, the difference between the lengths of two indentation diagonals should not be greater than 5 %. If the difference is greater, this shall be stated in the test report.
- Magnifications should be provided so that the diagonal can be enlarged to greater than 25 %, but less than 75 % of the field of view.
- h) Annex D contains calculation tables which shall be used to determine the Vickers hardness for tests on flat surfaces.

8 Uncertainty of the results

A complete evaluation of the uncertainty should be done according to the ISO Guide to the expression of uncertainty in measurement (GUM) [1].

Independent of the type of sources, for hardness there are two possibilities for the determination of the uncertainty.

- a) One possibility is based on the evaluation of all relevant sources appearing during a direct calibration. As a reference, an EA guideline [2] is available.
- b) The other possibility is based on indirect calibration using a hardness reference block [below abbreviated as CRM (certified reference material)] (see [2-5] in the Bibliography).

NOTE: A guideline for the determination of uncertainty is given in Annex D to ISO 6507-1.

9 Test report

The test report, if necessary, shall include the information selected from the following upon the agreement between the purchaser and the supplier:

- a) a reference to this Standard;
- b) all details necessary for identification of the test piece;
- c) the result obtained;

- d) all operations not specified in this Standard, or regarded as optional;
- e) details of any occurrence which may have affected the results;
- f) the temperature of the test, if it is outside the range specified in 7 a).

NOTE 1 A strict comparison of hardness values is only possible at identical test forces

- 2 There is no general process of accurately converting Vickers hardness into other scales of hardness or into tensile strength. Such conversions, therefore, should be avoided, unless a reliable basis for conversion can be obtained by comparison tests.
- 3 It should be noted that for anisotropic materials, for example those which have been heavily cold-worked, there will be a difference the lengths of the two diagonals of the indentation. Where possible, the indentation should be made so that the diagonals are inclined at approximately 45° to the direction of cold-working. The specification for the product may indicate limits for the differences between the lengths of the two diagonals.
- 4 There is evidence that some materials may be sensitive to the rate of straining which causes small changes in the value of the yield strength. The corresponding effect on the termination of the formation of an in dentation can make alterations in the hardness value.

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Annex A (normative)
Minimum thickness of the test piece in relation
to the force and to the hardness

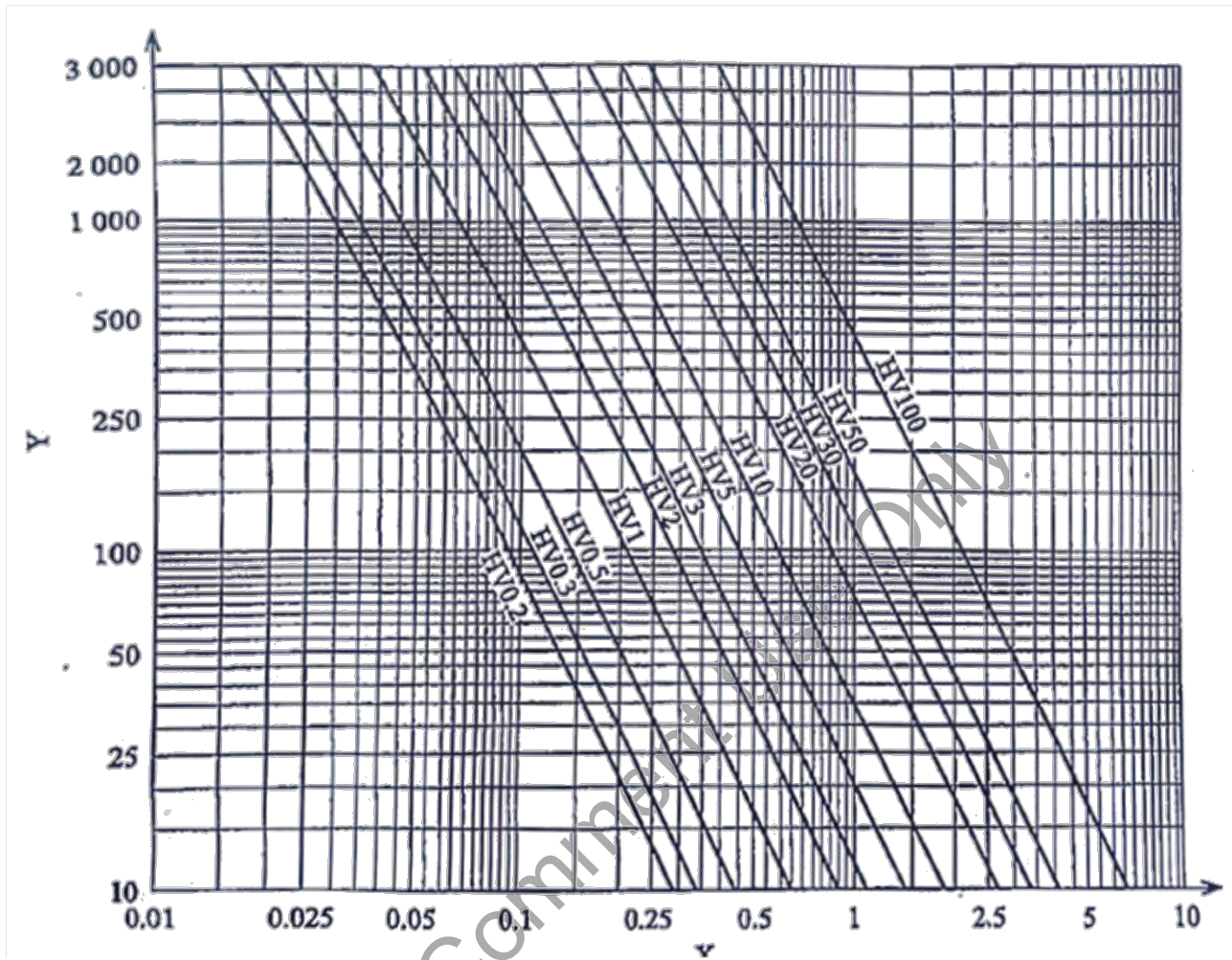
Introduction

This Annex specifies the minimum thickness of the test piece required in relation to the test force and to the hardness.

A.1 Obtaining method for the minimum thickness

Figure A.1 has been designed for obtaining the thickness which becomes 1.5 times the diagonal length of the indentation based on the hardness symbol and the hardness value. The minimum thickness of a test piece is given by the X-axis value of the point of intersection of the hardness symbol line used and the Y-axis hardness value.

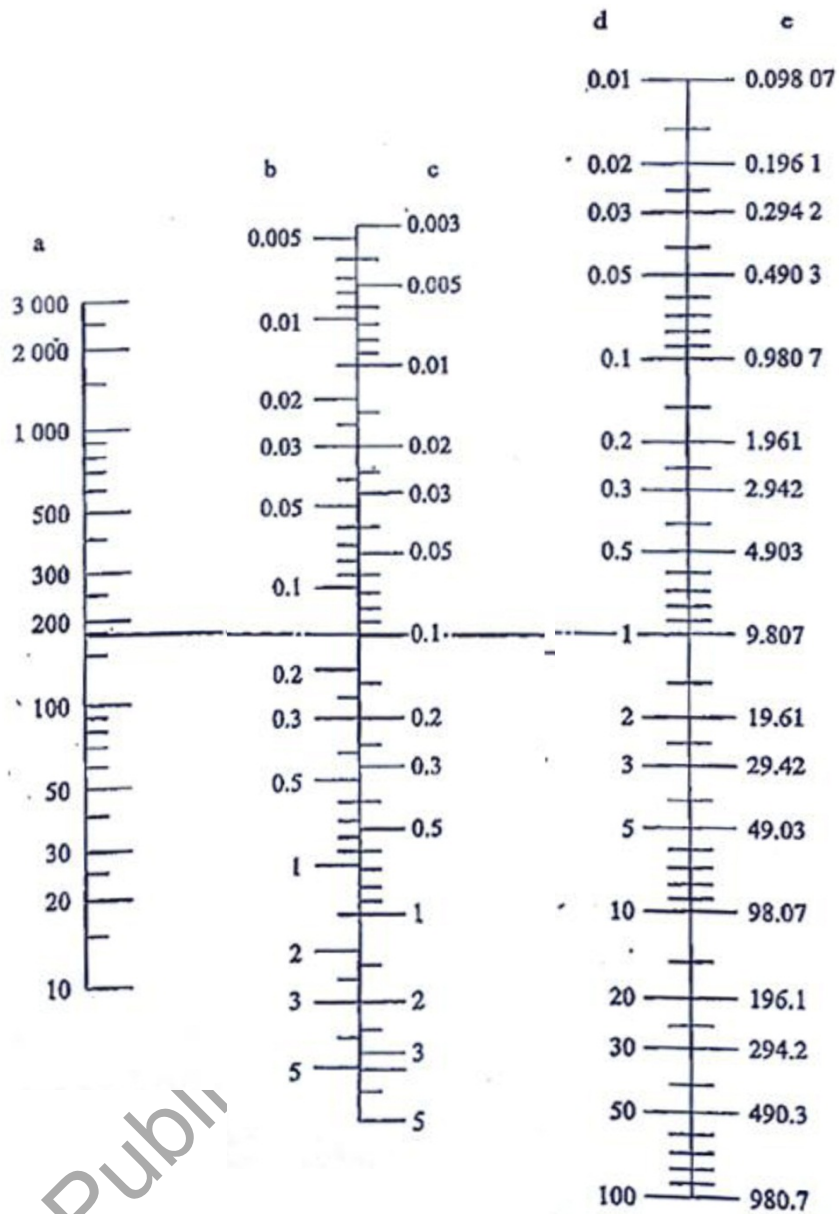
The nomogram shown in figure A.2 has been designed for minimum thickness of a test piece, assuming that the minimum thickness has to be 1.5 times the diagonal length of the indentation. The required thickness is given by the point of intersection of the minimum thickness scale and a line (shown long dashed dotted in the example in figure A.2) joining the test force (right-hand scale) with the hardness (left-hand scale).



X Thickness of the test piece (nm)

Y Hardness (HV)

Figure A.1 Minimum thickness of the test piece in relation to the test force and to the hardness (HV 0.2 to HV 100)



- a Hardness value, HV
- b Minimum thickness, t (mm)
- c Diagonal length, d (mm)
- d Hardness symbol, HV
- e Test force F (N)

Figure A.2 Nomogram designed for the minimum thickness of the test piece (HV 0.01 to HV 100)

Annex B (normative)

Tables of correction factors for use in tests made on curved surfaces

Introduction

This Annex specifies the correction factors when tests are made on curved surfaces.

B.1 Spherical surfaces

Tables B.1 and B.2 give the correction factors when tests are made on spherical surfaces.

The correction factors are tabulated in terms of the ratio of the mean diagonal d of the indentation to the diameter D of the sphere.

Example

Convex sphere, $D = 10$ mm

Test force, $F = 98.07$ N

Mean diagonal of indentation, $d = 0.150$ mm

$$d = \frac{0.15}{10} = 0.015$$

$$D = 10$$

$$\text{Vickers hardness} = \frac{0.1891 \times 98.07}{0.15^2} = 824 \text{ HV}_{10}$$

Correction factor from table B.1, by interpolation = 0.983

$$\text{Hardness of sphere} = 824 \times 0.983 = 810 \text{ HV}_{10}$$

Table B.1 Convex spherical surfaces

d/D	Correction factor	d/D	Correction factor
0.004	0.995	0.086	0.920
0.009	0.990	0.093	0.915
0.013	0.985	0.100	0.910
0.018	0.980	0.107	0.905
0.023	0.975	0.114	0.900
0.028	0.970	0.122	0.895
0.033	0.965	0.130	0.890
0.038	0.960	0.139	0.885
0.043	0.955	0.147	0.880
0.049	0.950	0.156	0.875
0.055	0.945	0.165	0.870
0.061	0.940	0.175	0.865
0.067	0.935	0.185	0.860
0.073	0.930	0.195	0.855
0.079	0.925	0.206	0.850

B.2 Cylindrical surfaces

d/D	Correction factor	d/D	Correction factor
0.004	1.005	0.057	1.080
0.008	1.010	0.060	1.085
0.012	1.015	0.063	1.090
0.016	1.020	0.066	1.095
0.020	1.025	0.069	1.100
0.024	1.030	0.071	1.105
0.028	1.035	0.074	1.110
0.031	1.040	0.077	1.115
0.035	1.045	0.079	1.120
0.038	1.050	0.082	1.125
0.041	1.055	0.084	1.130
0.045	1.060	0.087	1.135
0.048	1.065	0.089	1.140
0.051	1.070	0.091	1.145
0.054	1.075	0.094	1.150

B.2 Cylindrical surfaces

Tables B.3 to B.6 give the correction factors when tests are made on cylindrical surfaces. The correction factors are tabulated in terms of the ratio of the mean diagonal d of the indentation to the diameter D of the cylinder.

Example Concave cylinder, one diagonal of the indentation parallel to axis, $D = 5\text{mm}$

Test force, $F = 294.2\text{ N}$

Mean diagonal of indentation, $d = 0.415\text{ mm}$

$$\frac{d}{D} = \frac{0.415}{5} = 0.083$$

$$\frac{d}{D} = 0.083$$

$$\text{Vickers hardness} = 0.189 \times \frac{294.2}{0.415^2} = 323\text{ HV30}$$

Correction factor from table B.6 = 1.075

$$\text{Hardness of cylinder} = 323 \times 1.075 = 347\text{ HV 30}$$

Table B.3 Convex cylindrical surfaces-Diagonals at 45° to the axis

d/D	Correction factor	d/D	Correction factor
0.009	0.995	0.119	0.935
0.017	0.990	0.129	0.930
0.026	0.985	0.139	0.925
0.035	0.980	0.149	0.920
0.044	0.975	0.159	0.915
0.053	0.970	0.169	0.910
0.062	0.965	0.179	0.905
0.071	0.960	0.189	0.900
0.081	0.955	0.200	0.895
0.090	0.950		
0.100	0.945		
0.109	0.940		

Table B.4 Convex cylindrical surfaces-Diagonals at 45° to the axis

d/D	Correction factor	d/D	Correction factor
0.009	1.005	0.127	1.080
0.017	1.010	0.134	1.085
0.025	1.015	0.141	1.090
0.034	1.020	0.148	1.095
0.042	1.025	0.155	1.100
0.050	1.030	0.162	1.105
0.058	1.035	0.169	1.110
0.066	1.040	0.176	1.115
0.074	1.045	0.183	1.120
0.082	1.050	0.189	1.125
0.089	1.055	0.196	1.130
0.097	1.060	0.203	1.135
0.104	1.065	0.209	1.140
0.112	1.070	0.216	1.145
0.119	1.075	0.222	1.150

Table B.5 Convex cylindrical surfaces - One diagonal parallel to the axis

d/D	Correction factor	d/D	Correction factor
0.009	0.995	0.085	0.965
0.019	0.990	0.104	0.960
0.029	0.985	0.126	0.955
0.041	0.980	0.153	0.950
0.054	0.975	0.189	0.945
0.068	0.970	0.243	0.940

Table B.6 Concave cylindrical surfaces - One diagonal parallel to the axis

d/D	Correction factor	d/D	Correction factor
0.008	1.005	0.087	1.080
0.016	1.010	0.090	1.085
0.023	1.015	0.093	1.090
0.030	1.020	0.097	1.095
0.036	1.025	0.100	1.100
0.042	1.030	0.103	1.105
0.048	1.035	0.105	1.110
0.053	1.040	0.108	1.115
0.058	1.045	0.111	1.120
0.063	1.050	0.113	1.125
0.067	1.055	0.116	1.130
0.071	1.060	0.118	1.135
0.076	1.065	0.120	1.140
0.079	1.070	0.123	1.145
0.083	1.075	0.125	1.150

Annex C (informative)
Procedure for periodic checking of the testing
machine by the user

Introduction

This Annex is to supplement the matters related to the text and Annex (normative) and not to constitute the provisions of this Standard.

A check of the machine should be carried out on each day that the machine is used, at approximately each hardness level and for each range or scale that is to be used.

Prior to making the check, the measuring system should be indirectly verified (for each range/scale and hardness level) using a reference indentation on a hardness reference block, calibrated in accordance with JIS B 7735 [6]. The measured dimension should agree with the certified value to within the maximum permissible error given in JIS B 7725. If the measuring system fails this test, appropriate action should be taken.

The check involves at least one indentation being made on a hardness reference block, calibrated in accordance with JIS B 7735. If the difference between the mean measured hardness and the block's certified value is within the permissible error limits given in JIS B 7725, the machine may be regarded as satisfactory. If not, an indirect verification should be performed.

A record of these results should be maintained over a period of time, and used to measure reproducibility and monitor drift of the machine.

Annex D (normative)
Vickers hardness calculation table

Introduction

This Annex specifies the hardness values calculated by the Vickers hardness equation in table 2 of the text.

D.1 Scope

This Annex gives tables of Vickers hardness for use in tests made on flat surfaces.

D.2 Tables of Vickers hardness for use in test made on flat surfaces

See table D.1 for range <HV 0.2.

See table D.2 for range HV 0.2 to HV 3.

See table D.3 for range HV 5 to HV 100

Table D.1 <HV0.2 (d: 0.020 mm to 0.211 mm)

Mean diagonal of indentation d mm	Test force F (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.020 0	4.64	9.27	23.18	46.36	92.72	115.9	231.8	463.6
0.020 2	4.54	9.09	22.72	45.45	90.89	113.6	227.2	454.5
0.020 4	4.46	8.91	22.28	44.56	89.12	111.4	222.8	445.6
0.020 6	4.37	8.74	21.85	43.70	87.39	109.3	218.5	437.0
0.020 8	4.29	8.57	21.43	42.86	85.72	107.2	214.3	428.6
0.021 0	4.21	8.41	21.02	42.05	84.10	105.1	210.2	420.5
0.021 2	4.13	8.25	20.63	41.26	82.52	103.2	206.3	412.6
0.021 4	4.05	8.10	20.25	40.49	80.98	101.2	202.5	404.9
0.021 6	3.97	7.95	19.87	39.75	79.49	99.38	198.7	397.5
0.021 8	3.90	7.80	19.51	39.02	78.04	97.57	195.1	390.2
0.022 0	3.83	7.66	19.16	38.32	76.62	95.80	191.6	383.2
0.022 2	3.76	7.52	18.81	37.63	75.25	94.08	188.1	376.3
0.022 4	3.70	7.39	18.48	36.96	73.91	92.41	184.8	369.6
0.022 6	3.63	7.26	18.15	36.31	72.61	90.78	181.5	363.1
0.022 8	3.57	7.13	17.84	35.67	71.34	89.20	178.4	356.7
0.023 0	3.51	7.01	17.53	35.06	70.11	87.65	175.3	350.6
0.023 2	3.45	6.89	17.23	34.45	68.90	86.15	172.3	344.5
0.023 4	3.39	6.77	16.93	33.87	67.73	84.68	169.3	338.7
0.023 6	3.33	6.66	16.65	33.30	66.59	83.25	166.5	333.0
0.023 8	3.27	6.55	16.37	32.74	65.47	81.86	163.7	327.4
0.024 0	3.22	6.44	16.10	32.20	64.39	80.50	161.0	322.0
0.024 2	3.17	6.33	15.83	31.67	63.33	79.17	158.3	316.7
0.024 4	3.11	6.23	15.57	31.15	62.29	77.88	155.7	311.5
0.024 6	3.06	6.13	15.32	30.64	61.28	76.62	153.2	306.4
0.024 8	3.02	6.03	15.07	30.15	60.30	75.39	150.7	301.5

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.025 0	2.97	5.93	14.83	29.67	59.34	74.19	148.3	296.7
0.025 2	2.92	5.84	14.60	29.20	58.40	73.01	146.0	292.0
0.025 4	2.87	5.75	14.37	28.74	57.48	71.87	143.7	287.4
0.025 6	2.83	5.66	14.15	28.30	56.59	70.75	141.5	283.0
0.025 8	2.79	5.57	13.93	27.86	55.72	69.66	139.3	278.6
0.026 0	2.74	5.49	13.72	27.43	54.86	68.59	137.2	274.3
0.026 2	2.70	5.40	13.51	27.02	54.03	67.55	135.1	270.2
0.026 4	2.66	5.32	13.30	26.61	53.21	66.53	133.0	266.1
0.026 6	2.62	5.24	13.10	26.21	52.41	65.53	131.0	262.1
0.026 8	2.58	5.16	12.91	25.82	51.63	64.56	129.1	258.2
0.027 0	2.54	5.09	12.72	25.44	50.87	63.60	127.2	254.4
0.027 2	2.51	5.01	12.53	25.07	50.13	62.67	125.3	250.7
0.027 4	2.47	4.94	12.35	24.70	49.40	61.76	123.5	247.0
0.027 6	2.43	4.87	12.17	24.34	48.69	60.87	121.7	243.4
0.027 8	2.40	4.80	12.00	24.00	47.99	60.00	120.0	240.0
0.028 0	2.37	4.73	11.83	23.65	47.30	59.14	118.3	236.5
0.028 2	2.33	4.66	11.66	23.32	46.64	58.31	116.6	233.2
0.028 4	2.30	4.60	11.50	22.99	45.98	57.49	115.0	229.9
0.028 6	2.27	4.53	11.33	22.67	45.34	56.69	113.3	226.7
0.028 8	2.24	4.47	11.18	22.36	44.71	55.90	111.8	223.6
0.029 0	2.21	4.41	11.02	22.05	44.10	55.13	110.2	220.5
0.029 2	2.18	4.35	10.87	21.75	43.50	54.38	108.7	217.5
0.029 4	2.15	4.29	10.73	21.46	42.91	53.64	107.3	214.6
0.029 6	2.12	4.23	10.58	21.17	42.33	52.92	105.8	211.7
0.029 8	2.09	4.18	10.44	20.88	41.76	52.21	104.4	208.8
0.030 0	2.06	4.12	10.30	20.61	41.21	51.52	103.0	206.1
0.030 2	2.03	4.07	10.17	20.33	40.66	50.84	101.7	203.3
0.030 4	2.01	4.01	10.03	20.07	40.13	50.17	100.3	200.7
0.030 6	1.98	3.96	9.90	19.81	39.61	49.52	99.02	198.1
0.030 8	1.95	3.91	9.77	19.55	39.09	48.88	97.74	195.5
0.031 0	1.93	3.86	9.65	19.30	38.59	48.25	96.48	193.0
0.031 2	1.91	3.81	9.52	19.05	38.10	47.63	95.25	190.5
0.031 4	1.88	3.76	9.40	18.81	37.61	47.03	94.04	188.1
0.031 6	1.86	3.71	9.28	18.57	37.14	46.43	92.85	185.7
0.031 8	1.83	3.67	9.17	18.34	36.67	45.85	91.69	183.4
0.032 0	1.81	3.62	9.05	18.11	36.22	45.28	90.54	181.1
0.032 2	1.79	3.58	8.94	17.89	35.77	44.72	89.42	178.9
0.032 4	1.77	3.53	8.83	17.67	35.33	44.17	88.32	176.7
0.032 6	1.74	3.49	8.72	17.45	34.90	43.63	87.24	174.5
0.032 8	1.72	3.45	8.62	17.24	34.47	43.10	86.18	172.4
0.033 0	1.70	3.41	8.51	17.03	34.06	42.58	85.14	170.3
0.033 2	1.68	3.36	8.41	16.82	33.65	42.07	84.12	168.2
0.033 4	1.66	3.32	8.31	16.62	33.24	41.56	83.11	166.2
0.033 6	1.64	3.28	8.21	16.43	32.85	41.07	82.12	164.3
0.033 8	1.62	3.25	8.12	16.23	32.46	40.59	81.16	162.3

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force F (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.034 0	1.60	3.21	8.02	16.04	32.08	40.11	80.20	160.4
0.034 2	1.59	3.17	7.93	15.86	31.71	39.64	79.27	158.6
0.034 4	1.57	3.13	7.83	15.67	31.34	39.18	78.35	156.7
0.034 6	1.55	3.10	7.74	15.49	30.98	38.73	77.45	154.9
0.034 8	1.53	3.06	7.66	15.31	30.62	38.29	76.56	153.1
0.035 0	1.51	3.03	7.57	15.14	30.27	37.85	75.69	151.4
0.035 2	1.50	2.99	7.48	14.97	29.93	37.42	74.83	149.7
0.035 4	1.48	2.96	7.40	14.80	29.59	37.00	73.99	148.0
0.035 6	1.46	2.93	7.32	14.63	29.26	36.59	73.16	146.3
0.035 8	1.45	2.89	7.23	14.47	28.94	36.18	72.34	144.7
0.036 0	1.43	2.86	7.15	14.31	28.62	35.78	71.54	143.1
0.036 2	1.42	2.83	7.08	14.15	28.30	35.38	70.75	141.5
0.036 4	1.40	2.80	7.00	14.00	27.99	35.00	69.98	140.0
0.036 6	1.38	2.77	6.92	13.84	27.69	34.61	69.21	138.4
0.036 8	1.37	2.74	6.85	13.69	27.39	34.24	68.46	136.9
0.037 0	1.35	2.71	6.77	13.55	27.09	33.87	67.73	135.5
0.037 2	1.34	2.68	6.70	13.40	26.80	33.51	67.00	134.0
0.037 4	1.33	2.65	6.63	13.26	26.51	33.15	66.28	132.6
0.037 6	1.31	2.62	6.56	13.12	26.23	32.80	65.58	131.2
0.037 8	1.30	2.60	6.49	12.98	25.96	32.45	64.89	129.8
0.038 0	1.28	2.57	6.42	12.84	25.68	32.11	64.21	128.4
0.038 2	1.27	2.54	6.35	12.71	25.41	31.77	63.54	127.1
0.038 4	1.26	2.51	6.29	12.58	25.15	31.44	62.88	125.8
0.038 6	1.24	2.49	6.22	12.45	24.89	31.12	62.23	124.5
0.038 8	1.23	2.46	6.16	12.32	24.63	30.80	61.59	123.2
0.039 0	1.22	2.44	6.10	12.19	24.38	30.48	60.96	121.9
0.039 2	1.21	2.41	6.03	12.07	24.13	30.17	60.34	120.7
0.039 4	1.19	2.39	5.97	11.95	23.89	29.87	59.73	119.5
0.039 6	1.18	2.36	5.91	11.83	23.65	29.57	59.12	118.3
0.039 8	1.17	2.34	5.85	11.71	23.41	29.27	58.53	117.1
0.040 0	1.16	2.32	5.79	11.59	23.18	28.98	57.95	115.9
0.040 2	1.15	2.29	5.74	11.48	22.95	28.69	57.37	114.8
0.040 4	1.14	2.27	5.68	11.36	22.72	28.41	56.81	113.6
0.040 6	1.13	2.25	5.62	11.25	22.50	28.13	56.25	112.5
0.040 8	1.11	2.23	5.57	11.14	22.28	27.85	55.70	111.4
0.041 0	1.10	2.21	5.52	11.03	22.06	27.58	55.16	110.3
0.041 2	1.09	2.18	5.46	10.93	21.85	27.32	54.62	109.3
0.041 4	1.08	2.16	5.41	10.82	21.64	27.05	54.09	108.2
0.041 6	1.07	2.14	5.36	10.72	21.43	26.79	53.58	107.2
0.041 8	1.06	2.12	5.31	10.61	21.23	26.54	53.06	106.1
0.042 0	1.05	2.10	5.26	10.51	21.02	26.29	52.56	105.1
0.042 2	1.04	2.08	5.21	10.41	20.83	26.04	52.06	104.1
0.042 4	1.03	2.06	5.16	10.32	20.63	25.79	51.57	103.2
0.042 6	1.02	2.04	5.11	10.22	20.44	25.55	51.09	102.2
0.042 8	1.01	2.02	5.06	10.12	20.25	25.31	50.61	101.2

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.043 0	1.00	2.01	5.01	10.03	20.06	25.08	50.14	100.3
0.043 2	...	1.99	4.97	9.94	19.87	24.85	49.68	99.37
0.043 4	...	1.97	4.92	9.85	19.69	24.62	49.22	98.46
0.043 6	...	1.95	4.88	9.76	19.51	24.39	48.77	97.56
0.043 8	...	1.93	4.83	9.67	19.33	24.17	48.33	96.67
0.044 0	...	1.92	4.79	9.58	19.16	23.95	47.89	95.79
0.044 2	...	1.90	4.75	9.49	18.98	23.73	47.46	94.93
0.044 4	...	1.88	4.70	9.41	18.81	23.52	47.03	94.07
0.044 6	...	1.86	4.66	9.32	18.64	23.31	46.61	93.23
0.044 8	...	1.85	4.62	9.24	18.48	23.10	46.20	92.40
0.045 0	...	1.83	4.58	9.16	18.31	22.90	45.79	91.58
0.045 2	...	1.82	4.54	9.08	18.15	22.70	45.38	90.77
0.045 4	...	1.80	4.50	9.00	17.99	22.50	44.98	89.97
0.045 6	...	1.78	4.46	8.92	17.84	22.30	44.59	89.19
0.045 8	...	1.77	4.42	8.84	17.68	22.10	44.20	88.41
0.046 0	...	1.75	4.38	8.76	17.53	21.91	43.82	87.64
0.046 2	...	1.74	4.34	8.69	17.38	21.72	43.44	86.88
0.046 4	...	1.72	4.31	8.61	17.23	21.54	43.06	86.14
0.046 6	...	1.71	4.27	8.54	17.08	21.35	42.70	85.40
0.046 8	...	1.69	4.23	8.47	16.93	21.17	42.33	84.67
0.047 0	...	1.68	4.20	8.40	16.79	20.99	41.97	83.95
0.047 2	...	1.66	4.16	8.32	16.65	20.81	41.62	83.24
0.047 4	...	1.65	4.13	8.25	16.51	20.64	41.27	82.54
0.047 6	...	1.64	4.09	8.18	16.37	20.46	40.92	81.85
0.047 8	...	1.62	4.06	8.12	16.23	20.29	40.58	81.17
0.048 0	...	1.61	4.02	8.05	16.10	20.12	40.24	80.49
0.048 2	...	1.60	3.99	7.98	15.96	19.96	39.91	79.82
0.048 4	...	1.58	3.96	7.92	15.83	19.79	39.58	79.17
0.048 6	...	1.57	3.93	7.85	15.70	19.63	39.25	78.52
0.048 8	...	1.56	3.89	7.79	15.57	19.47	38.93	77.87
0.049 0	...	1.54	3.86	7.72	15.45	19.31	38.62	77.24
0.049 2	...	1.53	3.83	7.66	15.32	19.15	38.30	76.61
0.049 4	...	1.52	3.80	7.60	15.20	19.00	37.99	75.99
0.049 6	...	1.51	3.77	7.54	15.07	18.85	37.69	75.38
0.049 8	...	1.50	3.74	7.48	14.95	18.70	37.38	74.78
0.050 0	...	1.48	3.71	7.42	14.83	18.55	37.09	74.18
0.050 2	...	1.47	3.68	7.36	14.72	18.40	36.79	73.59
0.050 4	...	1.46	3.65	7.30	14.60	18.25	36.50	73.01
0.050 6	...	1.45	3.62	7.24	14.48	18.11	36.21	72.43
0.050 8	...	1.44	3.59	7.19	14.37	17.97	35.93	71.86
0.051 0	...	1.43	3.56	7.13	14.26	17.83	35.65	71.30
0.051 2	...	1.41	3.54	7.07	14.15	17.69	35.37	70.74
0.051 4	...	1.40	3.51	7.02	14.04	17.55	35.09	70.19
0.051 6	...	1.39	3.48	6.97	13.93	17.41	34.82	69.65
0.051 8	...	1.38	3.46	6.91	13.82	17.28	34.55	69.11

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.052 0	...	1.37	3.43	6.86	13.72	17.15	34.29	68.58
0.052 2	...	1.36	3.40	6.81	13.61	17.02	34.03	68.06
0.052 4	...	1.35	3.38	6.75	13.51	16.89	33.77	67.54
0.052 6	...	1.34	3.35	6.70	13.40	16.76	33.51	67.03
0.052 8	...	1.33	3.33	6.65	13.30	16.63	33.26	66.52
0.053 0	...	1.32	3.30	6.60	13.20	16.51	33.01	66.02
0.053 2	...	1.31	3.28	6.55	13.10	16.38	32.76	65.52
0.053 4	...	1.30	3.25	6.50	13.01	16.26	32.51	65.03
0.053 6	...	1.29	3.23	6.46	12.91	16.14	32.27	64.55
0.053 8	...	1.28	3.20	6.41	12.81	16.02	32.03	64.07
0.054 0	...	1.27	3.18	6.36	12.72	15.90	31.80	63.60
0.054 2	...	1.26	3.16	6.31	12.62	15.78	31.56	63.13
0.054 4	...	1.25	3.13	6.27	12.53	15.67	31.33	62.67
0.054 6	...	1.24	3.11	6.22	12.44	15.55	31.10	62.21
0.054 8	...	1.23	3.09	6.18	12.35	15.44	30.87	61.75
0.055 0	...	1.23	3.06	6.13	12.26	15.33	30.65	61.31
0.055 2	...	1.22	3.04	6.09	12.17	15.22	30.43	60.86
0.055 4	...	1.21	3.02	6.04	12.08	15.11	30.21	60.42
0.055 6	...	1.20	3.00	6.00	12.00	15.00	29.99	59.99
0.055 8	...	1.19	2.98	5.96	11.91	14.89	29.78	59.56
0.056 0	...	1.18	2.96	5.91	11.83	14.79	29.56	59.14
0.056 2	...	1.17	2.94	5.87	11.74	14.68	29.35	58.72
0.056 4	...	1.17	2.91	5.83	11.66	14.58	29.15	58.30
0.056 6	...	1.16	2.89	5.79	11.58	14.47	28.94	57.89
0.056 8	...	1.15	2.87	5.75	11.50	14.37	28.74	57.48
0.057 0	...	1.14	2.85	5.71	11.41	14.27	28.54	57.08
0.057 2	...	1.13	2.83	5.67	11.33	14.17	28.34	56.68
0.057 4	...	1.13	2.81	5.63	11.26	14.07	28.14	56.29
0.057 6	...	1.12	2.79	5.59	11.18	13.98	27.95	55.90
0.057 8	...	1.11	2.78	5.55	11.10	13.88	27.75	55.51
0.058 0	...	1.10	2.76	5.51	11.02	13.78	27.56	55.13
0.058 2	...	1.09	2.74	5.47	10.95	13.69	27.37	54.75
0.058 4	...	1.09	2.72	5.44	10.87	13.60	27.18	54.38
0.058 6	...	1.08	2.70	5.40	10.80	13.50	27.00	54.00
0.058 8	...	1.07	2.68	5.36	10.73	13.41	26.82	53.64
0.059 0	...	1.07	2.66	5.33	10.65	13.32	26.63	53.28
0.059 2	...	1.06	2.65	5.29	10.58	13.23	26.46	52.92
0.059 4	...	1.05	2.63	5.26	10.51	13.14	26.28	52.56
0.059 6	...	1.04	2.61	5.22	10.44	13.05	26.10	52.21
0.059 8	...	1.04	2.59	5.19	10.37	12.97	25.93	51.86
0.060 0	...	1.03	2.58	5.15	10.30	12.88	25.75	51.51
0.060 2	...	1.02	2.56	5.12	10.23	12.79	25.58	51.17
0.060 4	...	1.02	2.54	5.08	10.17	12.71	25.41	50.83
0.060 6	...	1.01	2.52	5.05	10.10	12.63	25.25	50.50
0.060 8	...	1.00	2.51	5.02	10.03	12.54	25.08	50.17

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.061 0	2.49	4. 98	9.97	12.46	24.92	49.84
0.061 2	2.48	4.95	9.90	12.38	24.75	49.51
0.061 4	2.46	4.92	9.84	12.30	24.59	49.19
0.061 6	2.44	4.89	9.77	12.22	24.43	48.87
0.061 8	2.43	4.86	9.71	12.14	24.28	48.56
0.062 0	2.41	4.82	9.65	12.06	24.12	48.24
0.062 2	2.40	4.79	9.59	11.98	23.96	47.93
0.062 4	2.38	4.76	9.52	11.91	23.81	47.63
0.062 6	2.37	4.73	9.46	11.83	23.66	47.32
0.062 8	2.35	4.70	9.40	11.76	23.51	47.02
0.063 0	2.34	4.67	9.34	11.68	23.36	46.72
0.063 2	2.32	4.64	9.28	11.61	23.21	46.43
0.063 4	2.31	4.61	9.23	11.54	23.07	46.14
0.063 6	2.29	4.58	9.17	11.46	22.92	45.85
0.063 8	2.28	4.56	9.11	11.39	22.78	45.56
0.064 0	2.26	4.53	9.05	11.32	22.64	45.28
0.064 2	2.25	4.50	9.00	11.25	22.49	44.99
0.064 4	2.24	4.47	8.94	11.18	22.36	44.72
0.064 6	2.22	4.44	8.89	11.11	22.22	44.44
0.064 8	2.21	4.42	8.83	11.04	22.08	44.16
0.065 0	2.19	4.39	8.78	10.97	21.94	43.89
0.065 2	2.18	4.36	8.72	10.91	21.81	43.62
0.065 4	2.17	4.34	8.67	10.84	21.68	43.36
0.065 6	2.15	4.31	8.62	10.77	21.54	43.09
0.065 8	2.14	4.28	8.57	10.71	21.41	42.83
0.066 0	2.13	4.26	8.51	10.64	21.28	42.57
0.066 2	2.12	4.23	8.46	10.58	21.16	42.32
0.066 4	2.10	4.21	8.41	10.52	21.03	42.06
0.066 6	2.09	4.18	8.36	10.45	20.90	41.81
0.066 8	2.08	4.16	8.31	10.39	20.78	41.56
0.067 0	2.07	4.13	8.26	10.33	20.65	41.31
0.067 2	2.05	4.11	8.21	10.27	20.53	41.07
0.067 4	2.04	4.08	8.16	10.21	20.41	40.82
0.067 6	2.03	4.06	8.12	10.15	20.29	40.58
0.067 8	2.02	4.03	8.07	10.09	20.17	40.34
0.068 0	2.01	4.01	8.02	10.03	20.05	40.11
0.068 2	1.99	3.99	7.97	9.97	19.93	39.87
0.068 4	1.98	3.96	7.93	9.91	19.82	39.64
0.068 6	1.97	3.94	7.88	9.85	19.70	39.41
0.068 8	1.96	3.92	7.83	9.80	19.59	39.18
0.069 0	1.95	3.90	7.79	9.74	19.47	38.95
0.069 2	1.94	3.87	7.74	9.68	19.36	38.73
0.069 4	1.93	3.85	7.70	9.63	19.25	38.50
0.069 6	1.91	3.83	7.66	9.57	19.14	38.28
0.069 8	1.90	3.81	7.61	9.52	19.03	38.06

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.070 0	1.89	3.78	7.57	9.46	18.92	37.85
0.070 2	1.88	3.76	7.53	9.41	18.81	37.63
0.070 4	1.87	3.74	7.48	9.36	18.71	37.42
0.070 6	1.86	3.72	7.44	9.30	18.60	37.21
0.070 8	1.85	3.70	7.40	9.25	18.50	37.00
0.071 0	1.84	3.68	7.36	9.20	18.39	36.79
0.071 2	1.83	3.66	7.32	9.15	18.29	36.58
0.071 4	1.82	3.64	7.27	9.10	18.19	36.38
0.071 6	1.81	3.62	7.23	9.04	18.09	36.17
0.071 8	1.80	3.60	7.19	8.99	17.98	35.97
0.072 0	1.79	3.58	7.15	8.94	17.88	35.77
0.072 2	1.78	3.56	7.11	8.89	17.79	35.58
0.072 4	1.77	3.54	7.08	8.85	17.69	35.38
0.072 6	1.76	3.52	7.04	8.80	17.59	35.18
0.072 8	1.75	3.50	7.00	8.75	17.49	34.99
0.073 0	1.74	3.48	6.96	8.70	17.40	34.80
0.073 2	1.73	3.46	6.92	8.65	17.30	34.61
0.073 4	1.72	3.44	6.88	8.61	17.21	34.42
0.073 6	1.71	3.42	6.85	8.56	17.12	34.24
0.073 8	1.70	3.40	6.81	8.51	17.02	34.05
0.074 0	1.69	3.39	6.77	8.47	16.93	33.87
0.074 2	1.68	3.37	6.74	8.42	16.84	33.68
0.074 4	1.67	3.35	6.70	8.38	16.75	33.50
0.074 6	1.67	3.33	6.66	8.33	16.66	33.32
0.074 8	1.66	3.31	6.63	8.29	16.57	33.15
0.075 0	1.65	3.30	6.59	8.24	16.48	32.97
0.075 2	1.64	3.28	6.56	8.20	16.40	32.79
0.075 4	1.63	3.26	6.52	8.16	16.31	32.62
0.075 6	1.62	3.24	6.49	8.11	16.22	32.45
0.075 8	1.61	3.23	6.45	8.07	16.14	32.28
0.076 0	1.61	3.21	6.42	8.03	16.05	32.11
0.076 2	1.60	3.19	6.39	7.99	15.97	31.94
0.076 4	1.59	3.18	6.35	7.94	15.88	31.77
0.076 6	1.58	3.16	6.32	7.90	15.80	31.61
0.076 8	1.57	3.14	6.29	7.86	15.72	31.44
0.077 0	1.56	3.13	6.26	7.82	15.64	31.28
0.077 2	1.56	3.11	6.22	7.78	15.56	31.12
0.077 4	1.55	3.10	6.19	7.74	15.48	30.96
0.077 6	1.54	3.08	6.16	7.70	15.40	30.80
0.077 8	1.53	3.06	6.13	7.66	15.32	30.64
0.078 0	1.52	3.05	6.10	7.62	15.24	30.48
0.078 2	1.52	3.03	6.06	7.58	15.16	30.33
0.078 4	1.51	3.02	6.03	7.54	15.08	30.17
0.078 6	1.50	3.00	6.00	7.51	15.01	30.02
0.078 8	1.49	2.99	5.97	7.47	14.93	29.87

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.079 0	1.49	2.97	5.94	7.43	14.86	29.71
0.079 2	1.48	2.96	5.91	7.39	14.78	29.56
0.079 4	1.47	2.94	5.88	7.35	14.71	29.42
0.079 6	1.46	2.93	5.85	7.32	14.63	29.27
0.079 8	1.46	2.91	5.82	7.28	14.56	29.12
0.080 0	1.45	2.90	5.79	7.24	14.49	28.98
0.080 2	1.44	2.88	5.77	7.21	14.41	28.83
0.080 4	1.43	2.87	5.74	7.17	14.34	28.69
0.080 6	1.43	2.85	5.71	7.14	14.27	28.55
0.080 8	1.42	2.84	5.68	7.10	14.20	28.41
0.081 0	1.41	2.83	5.65	7.07	14.13	28.27
0.081 2	1.41	2.81	5.62	7.03	14.06	28.13
0.081 4	1.40	2.80	5.60	7.00	13.99	27.99
0.081 6	1.39	2.79	5.57	6.96	13.92	27.85
0.081 8	1.39	2.77	5.54	6.93	13.86	27.72
0.082 0	1.38	2.76	5.52	6.90	13.79	27.58
0.082 2	1.37	2.74	5.49	6.86	13.72	27.45
0.082 4	1.37	2.73	5.46	6.83	13.66	27.31
0.082 6	1.36	2.72	5.44	6.80	13.59	27.18
0.082 8	1.35	2.70	5.41	6.76	13.52	27.05
0.083 0	1.35	2.69	5.38	6.73	13.46	26.92
0.083 2	1.34	2.68	5.36	6.70	13.39	26.79
0.083 4	1.33	2.67	5.33	6.67	13.33	26.66
0.083 6	1.33	2.65	5.31	6.63	13.27	26.53
0.083 8	1.32	2.64	5.28	6.60	13.20	26.41
0.084 0	1.31	2.63	5.26	6.57	13.14	26.28
0.084 2	1.31	2.62	5.23	6.54	13.08	26.16
0.084 4	1.30	2.60	5.21	6.51	13.02	26.03
0.084 6	1.30	2.59	5.18	6.48	12.95	25.91
0.084 8	1.29	2.58	5.16	6.45	12.89	25.79
0.085 0	1.28	2.57	5.13	6.42	12.83	25.67
0.085 2	1.28	2.55	5.11	6.39	12.77	25.55
0.085 4	1.27	2.54	5.09	6.36	12.71	25.43
0.085 6	1.27	2.53	5.06	6.33	12.65	25.31
0.085 8	1.26	2.52	5.04	6.30	12.59	25.19
0.086 0	1.25	2.51	5.01	6.27	12.54	25.07
0.086 2	1.25	2.50	4.99	6.24	12.48	24.96
0.086 4	1.24	2.48	4.97	6.21	12.42	24.84
0.086 6	1.24	2.47	4.95	6.18	12.36	24.73
0.086 8	1.23	2.46	4.92	6.15	12.31	24.61
0.087 0	1.22	2.45	4.90	6.13	12.25	24.50
0.087 2	1.22	2.44	4.88	6.10	12.19	24.39
0.087 4	1.21	2.43	4.86	6.07	12.14	24.28
0.087 6	1.21	2.42	4.83	6.04	12.08	24.17
0.087 8	1.20	2.41	4.81	6.01	12.03	24.06

Table D.1 (continued)

Mean diagonal of indentation d mm	Test force F (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.088 0	1.20	2.39	4.79	5.99	11.97	23.95
0.088 2	1.19	2.38	4.77	5.96	11.92	23.84
0.088 4	1.19	2.37	4.75	5.93	11.86	23.73
0.088 6	1.18	2.36	4.72	5.91	11.81	23.62
0.088 8	1.18	2.35	4.70	5.88	11.76	23.52
0.089 0	1.17	2.34	4.68	5.85	11.71	23.41
0.089 2	1.17	2.33	4.66	5.83	11.65	23.31
0.089 4	1.16	2.32	4.64	5.80	11.60	23.20
0.089 6	1.15	2.31	4.62	5.78	11.55	23.10
0.089 8	1.15	2.30	4.60	5.75	11.50	23.00
0.090 0	1.14	2.29	4.58	5.72	11.45	22.90
0.090 2	1.14	2.28	4.56	5.70	11.40	22.79
0.090 4	1.13	2.27	4.54	5.67	11.35	22.69
0.090 6	1.13	2.26	4.52	5.65	11.30	22.59
0.090 8	1.12	2.25	4.50	5.62	11.25	22.49
0.091 0	1.12	2.24	4.48	5.60	11.20	22.39
0.091 2	1.11	2.23	4.46	5.57	11.15	22.30
0.091 4	1.11	2.22	4.44	5.55	11.10	22.20
0.091 6	1.11	2.21	4.42	5.53	11.05	22.10
0.091 8	1.10	2.20	4.40	5.50	11.00	22.01
0.092 0	1.10	2.19	4.38	5.48	10.95	21.91
0.092 2	1.09	2.18	4.36	5.45	10.91	21.82
0.092 4	1.09	2.17	4.34	5.43	10.86	21.72
0.092 6	1.08	2.16	4.33	5.41	10.81	21.63
0.092 8	1.08	2.15	4.31	5.38	10.77	21.53
0.093 0	1.07	2.14	4.29	5.36	10.72	21.44
0.093 2	1.07	2.13	4.27	5.34	10.67	21.35
0.093 4	1.06	2.13	4.25	5.32	10.63	21.26
0.093 6	1.06	2.12	4.23	5.29	10.58	21.17
0.093 8	1.05	2.11	4.22	5.27	10.54	21.08
0.094 0	1.05	2.10	4.20	5.25	10.49	20.99
0.094 2	1.04	2.09	4.18	5.23	10.45	20.90
0.094 4	1.04	2.08	4.16	5.20	10.40	20.81
0.094 6	1.04	2.07	4.14	5.18	10.36	20.72
0.094 8	1.03	2.06	4.13	5.16	10.32	20.64
0.095 0	1.03	2.05	4.11	5.14	10.27	20.55
0.095 2	1.02	2.05	4.09	5.12	10.23	20.46
0.095 4	1.02	2.04	4.07	5.09	10.19	20.38
0.095 6	1.01	2.03	4.06	5.07	10.14	20.29
0.095 8	1.01	2.02	4.04	5.05	10.10	20.21
0.096 0	1.01	2.01	4.02	5.03	10.06	20.12
0.096 2	1.00	2.00	4.01	5.01	10.02	20.04
0.096 4	2.00	3.99	4.99	9.98	19.96
0.096 6	1.99	3.97	4.97	9.94	19.87
0.096 8	1.98	3.96	4.95	9.89	19.79

Table D.1 (continued)

Mean diagonal of indentation d mm	Test force F (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.097 0	1.97	3.94	4.93	9.85	19.71
0.097 2	1.96	3.93	4.91	9.81	19.63
0.097 4	1.95	3.91	4.89	9.77	19.55
0.097 6	1.95	3.89	4.87	9.73	19.47
0.097 8	1.94	3.88	4.85	9.69	19.39
0.098 0	1.93	3.86	4.83	9.65	19.31
0.098 2	1.92	3.85	4.81	9.61	19.23
0.098 4	1.92	3.83	4.79	9.58	19.15
0.098 6	1.91	3.81	4.77	9.54	19.08
0.098 8	1.90	3.80	4.75	9.50	19.00
0.099 0	1.89	3.78	4.73	9.46	18.92
0.099 2	1.88	3.77	4.71	9.42	18.85
0.099 4	1.88	3.75	4.69	9.38	18.77
0.099 6	1.87	3.74	4.67	9.35	18.69
0.099 8	1.86	3.72	4.66	9.31	18.62
0.100 0	1.85	3.71	4.64	9.27	18.55
0.100 2	1.85	3.69	4.62	9.23	18.47
0.100 4	1.84	3.68	4.60	9.20	18.40
0.100 6	1.83	3.66	4.58	9.16	18.32
0.100 8	1.83	3.65	4.56	9.12	18.25
0.101 0	1.82	3.64	4.55	9.09	18.18
0.101 2	1.81	3.62	4.53	9.05	18.11
0.101 4	1.80	3.61	4.51	9.02	18.04
0.101 6	1.80	3.59	4.49	8.98	17.97
0.101 8	1.79	3.58	4.47	8.95	17.90
0.102 0	1.78	3.56	4.46	8.91	17.82
0.102 2	1.78	3.55	4.44	8.88	17.76
0.102 4	1.77	3.54	4.42	8.84	17.69
0.102 6	1.76	3.52	4.40	8.81	17.62
0.102 8	1.75	3.51	4.39	8.77	17.55
0.103 0	1.75	3.50	4.37	8.74	17.48
0.103 2	1.74	3.48	4.35	8.71	17.41
0.103 4	1.73	3.47	4.34	8.67	17.35
0.103 6	1.73	3.46	4.32	8.64	17.28
0.103 8	1.72	3.44	4.30	8.61	17.21
0.104 0	1.71	3.43	4.29	8.57	17.15
0.104 2	1.71	3.42	4.27	8.54	17.08
0.104 4	1.70	3.40	4.25	8.51	17.01
0.104 6	1.69	3.39	4.24	8.47	16.95
0.104 8	1.69	3.38	4.22	8.44	16.89
0.105 0	1.68	3.36	4.21	8.41	16.82
0.105 2	1.68	3.35	4.19	8.38	16.76
0.105 4	1.67	3.34	4.17	8.35	16.69
0.105 6	1.66	3.33	4.16	8.31	16.63
0.105 8	1.66	3.31	4.14	8.28	16.57

Table D.1 (continued)

Mean diagonal of indentation d mm	Test force F (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.106 0	1.65	3.30	4.13	8.25	16.51
0.106 2	1.64	3.29	4.11	8.22	16.44
0.106 4	1.64	3.28	4.10	8.19	16.38
0.106 6	1.63	3.26	4.08	8.16	16.32
0.106 8	1.63	3.25	4.07	8.13	16.26
0.107 0	1.62	3.24	4.05	8.10	16.20
0.107 2	1.61	3.23	4.03	8.07	16.14
0.107 4	1.61	3.22	4.02	8.04	16.08
0.107 6	1.60	3.20	4.00	8.01	16.02
0.107 8	1.60	3.19	3.99	7.98	15.96
0.108 0	1.59	3.18	3.98	7.95	15.90
0.108 2	1.58	3.17	3.96	7.92	15.84
0.108 4	1.58	3.16	3.95	7.89	15.78
0.108 6	1.57	3.14	3.93	7.86	15.72
0.108 8	1.57	3.13	3.92	7.83	15.67
0.109 0	1.56	3.12	3.90	7.80	15.61
0.109 2	1.56	3.11	3.89	7.78	15.55
0.109 4	1.55	3.10	3.87	7.75	15.50
0.109 6	1.54	3.09	3.86	7.72	15.44
0.109 8	1.54	3.08	3.85	7.69	15.38
0.110 0	1.53	3.06	3.83	7.66	15.33
0.110 2	1.53	3.05	3.82	7.63	15.27
0.110 4	1.52	3.04	3.80	7.61	15.22
0.110 6	1.52	3.03	3.79	7.58	15.16
0.110 8	1.51	3.02	3.78	7.55	15.11
0.111 0	1.51	3.01	3.76	7.53	15.05
0.111 2	1.50	3.00	3.75	7.50	15.00
0.111 4	1.49	2.99	3.74	7.47	14.94
0.111 6	1.49	2.98	3.72	7.44	14.89
0.111 8	1.48	2.97	3.71	7.42	14.84
0.112 0	1.48	2.96	3.70	7.39	14.78
0.112 2	1.47	2.95	3.68	7.36	14.73
0.112 4	1.47	2.94	3.67	7.34	14.68
0.112 6	1.46	2.93	3.66	7.31	14.63
0.112 8	1.46	2.91	3.64	7.29	14.58
0.113 0	1.45	2.90	3.63	7.26	14.52
0.113 2	1.45	2.89	3.62	7.24	14.47
0.113 4	1.44	2.88	3.61	7.21	14.42
0.113 6	1.44	2.87	3.59	7.18	14.37
0.113 8	1.43	2.86	3.58	7.16	14.32
0.114 0	1.43	2.85	3.57	7.13	14.27
0.114 2	1.42	2.84	3.56	7.11	14.22
0.114 4	1.42	2.83	3.54	7.08	14.17
0.114 6	1.41	2.82	3.53	7.06	14.12
0.114 8	1.41	2.81	3.52	7.04	14.07

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.115 0	1.40	2.80	3.51	7.01	14.02
0.115 2	1.40	2.79	3.49	6.99	13.97
0.115 4	1.39	2.78	3.48	6.96	13.93
0.115 6	1.39	2.78	3.47	6.94	13.88
0.115 8	1.38	2.77	3.46	6.91	13.83
0.116 0	1.38	2.76	3.45	6.89	13.78
0.116 2	1.37	2.75	3.43	6.87	13.73
0.116 4	1.37	2.74	3.42	6.84	13.69
0.116 6	1.36	2.73	3.41	6.82	13.64
0.116 8	1.36	2.72	3.40	6.80	13.59
0.117 0	1.35	2.71	3.39	6.77	13.55
0.117 2	1.35	2.70	3.38	6.75	13.50
0.117 4	1.35	2.69	3.36	6.73	13.46
0.117 6	1.34	2.68	3.35	6.70	13.41
0.117 8	1.34	2.67	3.34	6.68	13.36
0.118 0	1.33	2.66	3.33	6.66	13.32
0.118 2	1.33	2.65	3.32	6.64	13.27
0.118 4	1.32	2.65	3.31	6.61	13.23
0.118 6	1.32	2.64	3.30	6.59	13.18
0.118 8	1.31	2.63	3.29	6.57	13.14
0.119 0	1.31	2.62	3.27	6.55	13.10
0.119 2	1.31	2.61	3.26	6.53	13.05
0.119 4	1.30	2.60	3.25	6.50	13.01
0.119 6	1.30	2.59	3.24	6.48	12.96
0.119 8	1.29	2.58	3.23	6.46	12.92
0.120 0	1.29	2.58	3.22	6.44	12.88
0.120 2	1.28	2.57	3.21	6.42	12.84
0.120 4	1.28	2.56	3.20	6.40	12.79
0.120 6	1.28	2.55	3.19	6.37	12.75
0.120 8	1.27	2.54	3.18	6.35	12.71
0.121 0	1.27	2.53	3.17	6.33	12.67
0.121 2	1.26	2.52	3.16	6.31	12.62
0.121 4	1.26	2.52	3.15	6.29	12.58
0.121 6	1.25	2.51	3.14	6.27	12.54
0.121 8	1.25	2.50	3.13	6.25	12.50
0.122 0	1.25	2.49	3.12	6.23	12.46
0.122 2	1.24	2.48	3.11	6.21	12.42
0.122 4	1.24	2.48	3.09	6.19	12.38
0.122 6	1.23	2.47	3.08	6.17	12.34
0.122 8	1.23	2.46	3.07	6.15	12.30
0.123 0	1.23	2.45	3.06	6.13	12.26
0.123 2	1.22	2.44	3.05	6.11	12.22
0.123 4	1.22	2.44	3.04	6.09	12.18
0.123 6	1.21	2.43	3.04	6.07	12.14
0.123 8	1.21	2.42	3.03	6.05	12.10

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.124 0	1.21	2.41	3.02	6.03	12.06
0.124 2	1.20	2.40	3.01	6.01	12.02
0.124 4	1.20	2.40	3.00	5.99	11.98
0.124 6	1.19	2.39	2.99	5.97	11.95
0.124 8	1.19	2.38	2.98	5.95	11.91
0.125 0	1.19	2.37	2.97	5.93	11.87
0.125 2	1.18	2.37	2.96	5.91	11.83
0.125 4	1.18	2.36	2.95	5.90	11.79
0.125 6	1.18	2.35	2.94	5.88	11.76
0.125 8	1.17	2.34	2.93	5.86	11.72
0.126 0	1.17	2.34	2.92	5.84	11.68
0.126 2	1.16	2.33	2.91	5.82	11.64
0.126 4	1.16	2.32	2.90	5.80	11.61
0.126 6	1.16	2.31	2.89	5.78	11.57
0.126 8	1.15	2.31	2.88	5.77	11.53
0.127 0	1.15	2.30	2.87	5.75	11.50
0.127 2	1.15	2.29	2.87	5.73	11.46
0.127 4	1.14	2.28	2.86	5.71	11.43
0.127 6	1.14	2.28	2.85	5.69	11.39
0.127 8	1.14	2.27	2.84	5.68	11.35
0.128 0	1.13	2.26	2.83	5.66	11.32
0.128 2	1.13	2.26	2.82	5.64	11.28
0.128 4	1.12	2.25	2.81	5.62	11.25
0.128 6	1.12	2.24	2.80	5.61	11.21
0.128 8	1.12	2.24	2.79	5.59	11.18
0.129 0	1.11	2.23	2.79	5.57	11.14
0.129 2	1.11	2.22	2.78	5.55	11.11
0.129 4	1.11	2.21	2.77	5.54	11.08
0.129 6	1.10	2.21	2.76	5.52	11.04
0.129 8	1.10	2.20	2.75	5.50	11.01
0.130 0	1.10	2.19	2.74	5.49	10.97
0.130 2	1.09	2.19	2.74	5.47	10.94
0.130 4	1.09	2.18	2.73	5.45	10.91
0.130 6	1.09	2.17	2.72	5.44	10.87
0.130 8	1.08	2.17	2.71	5.42	10.84
0.131 0	1.08	2.16	2.70	5.40	10.81
0.131 2	1.08	2.15	2.69	5.39	10.77
0.131 4	1.07	2.15	2.69	5.37	10.74
0.131 6	1.07	2.14	2.68	5.35	10.71
0.131 8	1.07	2.13	2.67	5.34	10.68
0.132 0	1.06	2.13	2.66	5.32	10.64
0.132 2	1.06	2.12	2.65	5.31	10.61
0.132 4	1.06	2.12	2.65	5.29	10.58
0.132 6	1.05	2.11	2.64	5.27	10.55
0.132 8	1.05	2.10	2.63	5.26	10.52

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.133 0	1.05	2.10	2.62	5.24	10.48
0.133 2	1.05	2.09	2.61	5.23	10.45
0.133 4	1.04	2.08	2.61	5.21	10.42
0.133 6	1.04	2.08	2.60	5.19	10.39
0.133 8	1.04	2.07	2.59	5.18	10.36
0.134 0	1.03	2.07	2.58	5.16	10.33
0.134 2	1.03	2.06	2.57	5.15	10.30
0.134 4	1.03	2.05	2.57	5.13	10.27
0.134 6	1.02	2.05	2.56	5.12	10.24
0.134 8	1.02	2.04	2.55	5.10	10.21
0.135 0	1.02	2.03	2.54	5.09	10.18
0.135 2	1.01	2.03	2.54	5.07	10.15
0.135 4	1.01	2.02	2.53	5.06	10.12
0.135 6	1.01	2.02	2.52	5.04	10.09
0.135 8	1.01	2.01	2.51	5.03	10.06
0.136 0	1.00	2.01	2.51	5.01	10.03
0.136 2	2.00	2.50	5.00	10.00
0.136 4	1.99	2.49	4.98	9.97
0.136 6	1.99	2.48	4.97	9.94
0.136 8	1.98	2.48	4.95	9.91
0.137 0	1.98	2.47	4.94	9.88
0.137 2	1.97	2.46	4.93	9.85
0.137 4	1.96	2.46	4.91	9.82
0.137 6	1.96	2.45	4.90	9.79
0.137 8	1.95	2.44	4.88	9.77
0.138 0	1.95	2.43	4.87	9.74
0.138 2	1.94	2.43	4.85	9.71
0.138 4	1.94	2.42	4.84	9.68
0.138 6	1.93	2.41	4.83	9.65
0.138 8	1.93	2.41	4.81	9.63
0.139 0	1.92	2.40	4.80	9.60
0.139 2	1.91	2.39	4.78	9.57
0.139 4	1.91	2.39	4.77	9.54
0.139 6	1.90	2.38	4.76	9.52
0.139 8	1.90	2.37	4.74	9.49
0.140 0	1.89	2.37	4.73	9.46
0.140 2	1.89	2.36	4.72	9.43
0.140 4	1.88	2.35	4.70	9.41
0.140 6	1.88	2.35	4.69	9.38
0.140 8	1.87	2.34	4.68	9.35
0.141 0	1.87	2.33	4.66	9.33
0.141 2	1.86	2.33	4.65	9.30
0.141 4	1.85	2.32	4.64	9.28
0.141 6	1.85	2.31	4.62	9.25
0.141 8	1.84	2.31	4.61	9.22

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.142 0	1.84	2.30	4.60	9.20
0.142 2	1.83	2.29	4.59	9.17
0.142 4	1.83	2.29	4.57	9.15
0.142 6	1.82	2.28	4.56	9.12
0.142 8	1.82	2.27	4.55	9.09
0.143 0	1.81	2.27	4.53	9.07
0.143 2	1.81	2.26	4.52	9.04
0.143 4	1.80	2.25	4.51	9.02
0.143 6	1.80	2.25	4.50	8.99
0.143 8	1.79	2.24	4.48	8.97
0.144 0	1.79	2.24	4.47	8.94
0.144 2	1.78	2.23	4.46	8.92
0.144 4	1.78	2.22	4.45	8.89
0.144 6	1.77	2.22	4.43	8.87
0.144 8	1.77	2.21	4.42	8.84
0.145 0	1.76	2.21	4.41	8.82
0.145 2	1.76	2.20	4.40	8.80
0.145 4	1.75	2.19	4.39	8.77
0.145 6	1.75	2.19	4.37	8.75
0.145 8	1.74	2.18	4.36	8.72
0.146 0	1.74	2.18	4.35	8.70
0.146 2	1.74	2.17	4.34	8.68
0.146 4	1.73	2.16	4.33	8.65
0.146 6	1.73	2.16	4.31	8.63
0.146 8	1.72	2.15	4.30	8.61
0.147 0	1.72	2.15	4.29	8.58
0.147 2	1.71	2.14	4.28	8.56
0.147 4	1.71	2.13	4.27	8.54
0.147 6	1.70	2.13	4.26	8.51
0.147 8	1.70	2.12	4.24	8.49
0.148 0	1.69	2.12	4.23	8.47
0.148 2	1.69	2.11	4.22	8.44
0.148 4	1.68	2.11	4.21	8.42
0.148 6	1.68	2.10	4.20	8.40
0.148 8	1.67	2.09	4.19	8.38
0.149 0	1.67	2.09	4.18	8.35
0.149 2	1.67	2.08	4.17	8.33
0.149 4	1.66	2.08	4.15	8.31
0.149 6	1.66	2.07	4.14	8.29
0.149 8	1.65	2.07	4.13	8.26
0.150 0	1.65	2.06	4.12	8.24
0.150 2	1.64	2.06	4.11	8.22
0.150 4	1.64	2.05	4.10	8.20
0.150 6	1.64	2.04	4.09	8.18
...	1.63	2.04	4.08	8.16

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.151 0	1.63	2.03	4.07	8.13
0.151 2	1.62	2.03	4.06	8.11
0.151 4	1.62	2.02	4.04	8.09
0.151 6	1.61	2.02	4.03	8.07
0.151 8	1.61	2.01	4.02	8.05
0.152 0	1.61	2.01	4.01	8.03
0.152 2	1.60	2.00	4.00	8.01
0.152 4	1.60	2.00	3.99	7.98
0.152 6	1.59	1.99	3.98	7.96
0.152 8	1.59	1.99	3.97	7.94
0.153 0	1.58	1.98	3.96	7.92
0.153 2	1.58	1.98	3.95	7.90
0.153 4	1.58	1.97	3.94	7.88
0.153 6	1.57	1.97	3.93	7.86
0.153 8	1.57	1.96	3.92	7.84
0.154 0	1.56	1.96	3.91	7.82
0.154 2	1.56	1.95	3.90	7.80
0.154 4	1.56	1.94	3.89	7.78
0.154 6	1.55	1.94	3.88	7.76
0.154 8	1.55	1.93	3.87	7.74
0.155 0	1.54	1.93	3.86	7.72
0.155 2	1.54	1.92	3.85	7.70
0.155 4	1.54	1.92	3.84	7.68
0.155 6	1.53	1.92	3.83	7.66
0.155 8	1.53	1.91	3.82	7.64
0.156 0	1.52	1.91	3.81	7.62
0.156 2	1.52	1.90	3.80	7.60
0.156 4	1.52	1.90	3.79	7.58
0.156 6	1.51	1.89	3.78	7.56
0.156 8	1.51	1.89	3.77	7.54
0.157 0	1.50	1.88	3.76	7.52
0.157 2	1.50	1.88	3.75	7.50
0.157 4	1.50	1.87	3.74	7.49
0.157 6	1.49	1.87	3.73	7.47
0.157 8	1.49	1.86	3.72	7.45
0.158 0	1.49	1.86	3.71	7.43
0.158 2	1.48	1.85	3.70	7.41
0.158 4	1.48	1.85	3.70	7.39
0.158 6	1.47	1.84	3.69	7.37
0.158 8	1.47	1.84	3.68	7.35
0.159 0	1.47	1.83	3.67	7.34
0.159 2	1.46	1.83	3.66	7.32
0.159 4	1.46	1.82	3.65	7.30
0.159 6	1.46	1.82	3.64	7.28
0.159 8	1.45	1.82	3.63	7.26

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.160 0	1.45	1.81	3.62	7.24
0.160 2	1.45	1.81	3.61	7.23
0.160 4	1.44	1.80	3.60	7.21
0.160 6	1.44	1.80	3.59	7.19
0.160 8	1.43	1.79	3.59	7.17
0.161 0	1.43	1.79	3.58	7.15
0.161 2	1.43	1.78	3.57	7.14
0.161 4	1.42	1.78	3.56	7.12
0.161 6	1.42	1.78	3.55	7.10
0.161 8	1.42	1.77	3.54	7.08
0.162 0	1.41	1.77	3.53	7.07
0.162 2	1.41	1.76	3.52	7.05
0.162 4	1.41	1.76	3.52	7.03
0.162 6	1.40	1.75	3.51	7.01
0.162 8	1.40	1.75	3.50	7.00
0.163 0	1.40	1.75	3.49	6.98
0.163 2	1.39	1.74	3.48	6.96
0.163 4	1.39	1.74	3.47	6.95
0.163 6	1.39	1.73	3.46	6.93
0.163 8	1.38	1.73	3.46	6.91
0.164 0	1.38	1.72	3.45	6.90
0.164 2	1.38	1.72	3.44	6.88
0.164 4	1.37	1.72	3.43	6.86
0.164 6	1.37	1.71	3.42	6.84
0.164 8	1.37	1.71	3.41	6.83
0.165 0	1.36	1.70	3.41	6.81
0.165 2	1.36	1.70	3.40	6.80
0.165 4	1.36	1.69	3.39	6.78
0.165 6	1.35	1.69	3.38	6.76
0.165 8	1.35	1.69	3.37	6.75
0.166 0	1.35	1.68	3.36	6.73
0.166 2	1.34	1.68	3.36	6.71
0.166 4	1.34	1.67	3.35	6.70
0.166 6	1.34	1.67	3.34	6.68
0.166 8	1.33	1.67	3.33	6.67
0.167 0	1.33	1.66	3.32	6.65
0.167 2	1.33	1.66	3.32	6.63
0.167 4	1.32	1.65	3.31	6.62
0.167 6	1.32	1.65	3.30	6.60
0.167 8	1.32	1.65	3.29	6.59
0.168 0	1.31	1.64	3.28	6.57
0.168 2	1.31	1.64	3.28	6.56
0.168 4	1.31	1.64	3.27	6.54
0.168 6	1.30	1.63	3.26	6.52
0.168 8	1.30	1.63	3.25	6.51

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.169 0	1.30	1.62	3.25	6.49
0.169 2	1.30	1.62	3.24	6.48
0.169 4	1.29	1.62	3.23	6.46
0.169 6	1.29	1.61	3.22	6.45
0.169 8	1.29	1.61	3.22	6.43
0.170 0	1.28	1.60	3.21	6.42
0.170 2	1.28	1.60	3.20	6.40
0.170 4	1.28	1.60	3.19	6.39
0.170 6	1.27	1.59	3.19	6.37
0.170 8	1.27	1.59	3.18	6.36
0.171 0	1.27	1.59	3.17	6.34
0.171 2	1.27	1.58	3.16	6.33
0.171 4	1.26	1.58	3.16	6.31
0.171 6	1.26	1.57	3.15	6.30
0.171 8	1.26	1.57	3.14	6.28
0.172 0	1.25	1.57	3.13	6.27
0.172 2	1.25	1.56	3.13	6.25
0.172 4	1.25	1.56	3.12	6.24
0.172 6	1.24	1.56	3.11	6.23
0.172 8	1.24	1.55	3.11	6.21
0.173 0	1.24	1.55	3.10	6.20
0.173 2	1.24	1.55	3.09	6.18
0.173 4	1.23	1.54	3.08	6.17
0.173 6	1.23	1.54	3.08	6.15
0.173 8	1.23	1.54	3.07	6.14
0.174 0	1.22	1.53	3.06	6.13
0.174 2	1.22	1.53	3.06	6.11
0.174 4	1.22	1.52	3.05	6.10
0.174 6	1.22	1.52	3.04	6.08
0.174 8	1.21	1.52	3.03	6.07
0.175 0	1.21	1.51	3.03	6.06
0.175 2	1.21	1.51	3.02	6.04
0.175 4	1.21	1.51	3.01	6.03
0.175 6	1.20	1.50	3.01	6.01
0.175 8	1.20	1.50	3.00	6.00
0.176 0	1.20	1.50	2.99	5.99
0.176 2	1.19	1.49	2.99	5.97
0.176 4	1.19	1.49	2.98	5.96
0.176 6	1.19	1.49	2.97	5.95
0.176 8	1.19	1.48	2.97	5.93
0.177 0	1.18	1.48	2.96	5.92
0.177 2	1.18	1.48	2.95	5.91
0.177 4	1.18	1.47	2.95	5.89
0.177 6	1.18	1.47	2.94	5.88
0.177 8	1.17	1.47	2.93	5.87

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.178 0	1.17	1.46	2.93	5.85
0.178 2	1.17	1.46	2.92	5.84
0.178 4	1.17	1.46	2.91	5.83
0.178 6	1.16	1.45	2.91	5.81
0.178 8	1.16	1.45	2.90	5.80
0.179.0	1.16	1.45	2.89	5.79
0.179 2	1.15	1.44	2.89	5.77
0.179 4	1.15	1.44	2.88	5.76
0.179 6	1.15	1.44	2.87	5.75
0.179 8	1.15	1.43	2.87	5.74
0.180 0	1.14	1.43	2.86	5.72
0.180 2	1.14	1.43	2.86	5.71
0.180 4	1.14	1.42	2.85	5.70
0.180 6	1.14	1.42	2.84	5.69
0.180 8	1.13	1.42	2.84	5.67
0.181 0	1.13	1.42	2.83	5.66
0.181 2	1.13	1.41	2.82	5.65
0.181 4	1.13	1.41	2.82	5.64
0.181 6	1.12	1.41	2.81	5.62
0.181 8	1.12	1.40	2.81	5.61
0.182 0	1.12	1.40	2.80	5.60
0.182 2	1.12	1.40	2.79	5.59
0.182 4	1.11	1.39	2.79	5.57
0.182 6	1.11	1.39	2.78	5.56
0.182 8	1.11	1.39	2.77	5.55
0.183 0	1.11	1.38	2.77	5.54
0.183 2	1.11	1.38	2.76	5.53
0.183 4	1.10	1.38	2.76	5.51
0.183 6	1.10	1.38	2.75	5.50
0.183 8	1.10	1.37	2.74	5.49
0.184 0	1.10	1.37	2.74	5.48
0.184 2	1.09	1.37	2.73	5.47
0.184 4	1.09	1.36	2.73	5.45
0.184 6	1.09	1.36	2.72	5.44
0.184 8	1.09	1.36	2.71	5.43
0.185 0	1.08	1.35	2.71	5.42
0.185 2	1.08	1.35	2.70	5.41
0.185 4	1.08	1.35	2.70	5.40
0.185 6	1.08	1.35	2.69	5.38
0.185 8	1.07	1.34	2.69	5.37
0.186 0	1.07	1.34	2.68	5.36
0.186 2	1.07	1.34	2.67	5.35
0.186 4	1.07	1.33	2.67	5.34
0.186 6	1.07	1.33	2.66	5.33
0.186 8	1.06	1.33	2.66	5.31

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.187 0	1.06	1.33	2.65	5.30
0.187 2	1.06	1.32	2.65	5.29
0.187 4	1.06	1.32	2.64	5.28
0.187 6	1.05	1.32	2.63	5.27
0.187 8	1.05	1.31	2.63	5.26
0.188 0	1.05	1.31	2.62	5.25
0.188 2	1.05	1.31	2.62	5.24
0.188 4	1.04	1.31	2.61	5.22
0.188 6	1.04	1.30	2.61	5.21
0.188 8	1.04	1.30	2.60	5.20
0.189 0	1.04	1.30	2.60	5.19
0.189 2	1.04	1.30	2.59	5.18
0.189 4	1.03	1.29	2.58	5.17
0.189 6	1.03	1.29	2.58	5.16
0.189 8	1.03	1.29	2.57	5.15
0.190 0	1.03	1.28	2.57	5.14
0.190 2	1.03	1.28	2.56	5.13
0.190 4	1.02	1.28	2.56	5.12
0.190 6	1.02	1.28	2.55	5.10
0.190 8	1.02	1.27	2.55	5.09
0.191 0	1.02	1.27	2.54	5.08
0.191 2	1.01	1.27	2.54	5.07
0.191 4	1.01	1.27	2.53	5.06
0.191 6	1.01	1.26	2.53	5.05
0.191 8	1.01	1.26	2.52	5.04
0.192 0	1.01	1.26	2.52	5.03
0.192 2	1.00	1.26	2.51	5.02
0.192 4	1.00	1.25	2.50	5.01
0.192.6	1.25	2.50	5.00
0.192 8	1.25	2.49	4.99
0.193 0	1.24	2.49	4.98
0.193 2	1.24	2.48	4.97
0.193 4	1.24	2.48	4.96
0.193 6	1.24	2.47	4.95
0.193 8	1.23	2.47	4.94
0.194 0	1.23	2.46	4.93
0.194 2	1.23	2.46	4.92
0.194 4	1.23	2.45	4.91
0.194 6	1.22	2.45	4.90
0.194 8	1.22	2.44	4.89
0.195 0	1.22	2.44	4.88
0.195 2	1.22	2.43	4.87
0.195 4	1.21	2.43	4.86
0.195 6	1.21	2.42	4.85
0.195 8	1.21	2.42	4.84

Table D.1 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.196 0	1.21	2.41	4.83
0.196 2	1.20	2.41	4.82
0.196 4	1.20	2.40	4.81
0.196 6	1.20	2.40	4.80
0.196 8	1.20	2.39	4.79
0.197 0	1.19	2.39	4.78
0.197 2	1.19	2.38	4.77
0.197 4	1.19	2.38	4.76
0.197 6	1.19	2.37	4.75
0.197 8	1.19	2.37	4.74
0.198 0	1.18	2.36	4.73
0.198 2	1.18	2.36	4.72
0.198 4	1.18	2.36	4.71
0.198 6	1.18	2.35	4.70
0.198 8	1.17	2.35	4.69
0.199 0	1.17	2.34	4.68
0.199 2	1.17	2.34	4.67
0.199 4	1.17	2.33	4.66
0.199 6	1.16	2.33	4.65
0.199 8	1.16	2.32	4.65
0.200 0	1.16	2.32	4.64
0.200 2	1.16	2.31	4.63
0.200 4	1.15	2.31	4.62
0.200 6	1.15	2.30	4.61
0.200 8	1.15	2.30	4.60
0.201 0	1.15	2.29	4.59
0.201 2	1.15	2.29	4.58
0.201 4	1.14	2.29	4.57
0.201 6	1.14	2.28	4.56
0.201 8	1.14	2.28	4.55
0.202 0	1.14	2.27	4.54
0.202 2	1.13	2.27	4.54
0.202 4	1.13	2.26	4.53
0.202 6	1.13	2.26	4.52
0.202 8	1.13	2.25	4.51
0.203 0	1.13	2.25	4.50
0.203 2	1.12	2.25	4.49
0.203 4	1.12	2.24	4.48
0.203 6	1.12	2.24	4.47
0.203 8	1.12	2.23	4.46
0.204 0	1.11	2.23	4.46
0.204 2	1.11	2.22	4.45
0.204 4	1.11	2.22	4.44
0.204 6	1.11	2.21	4.43
0.204 8	1.11	2.21	4.42

Table D.1 (concluded)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)							
	0.009 807	0.019 61	0.049 03	0.098 07	0.196 1	0.245 2	0.490 3	0.980 7
	Vickers hardness							
	HV0.001	HV0.002	HV0.005	HV0.01	HV0.02	HV0.025	HV0.05	HV0.1
0.205 0	1.10	2.21	4.41
0.205 2	1.10	2.20	4.40
0.205 4	1.10	2.20	4.40
0.205 6	1.10	2.19	4.39
0.205 8	1.09	2.19	4.38
0.206 0	1.09	2.18	4.37
0.206 2	1.09	2.18	4.36
0.206 4	1.09	2.18	4.35
0.206 6	1.09	2.17	4.34
0.206 8	1.08	2.17	4.34
0.207 0	1.08	2.16	4.33
0.207 2	1.08	2.16	4.32
0.207 4	1.08	2.16	4.31
0.207 6	1.08	2.15	4.30
0.207 8	1.07	2.15	4.29
0.208 0	1.07	2.14	4.29
0.208 2	1.07	2.14	4.28
0.208 4	1.07	2.13	4.27
0.208 6	1.07	2.13	4.26
0.208 8	1.06	2.13	4.25
0.209 0	1.06	2.12	4.25
0.209 2	1.06	2.12	4.24
0.209 4	1.06	2.11	4.23
0.209 6	1.06	2.11	4.22
0.209 8	1.05	2.11	4.21
0.210 0	1.05	2.10	4.21
0.210 2	1.05	2.10	4.20
0.210 4	1.05	2.09	4.19
0.210 6	1.05	2.09	4.18
0.210 8	1.04	2.09	4.17
0.211 0	1.04	2.08	4.17

Table D.2 HV 0.2 to HV 3 (d : 0.011 mm to 0.85 mm)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.011 0	3 065	...	...	...	...	...	...
0.011 2	2 956	...	...	...	...	...	...
0.011 4	2 853	...	...	...	...	...	...
0.011 6	2 756	...	...	...	...	...	...
0.011 8	2 663	...	...	...	...	...	...
0.012 0	2 575	...	...	...	...	...	...
0.012 2	2 491	...	...	...	...	...	...
0.012 4	2 412	...	...	...	...	...	...
0.012 6	2 336	...	...	...	...	...	...
0.012 8	2 263	...	...	...	...	...	...
0.013 0	2 194	...	...	...	...	...	...
0.013 2	2 128	...	...	...	...	...	...
0.013 4	2 065	...	...	...	...	...	...
0.013 6	2 005	...	...	...	...	...	...
0.013 8	1 947	2 921	...	...	...	...	...
0.014 0	1 892	2 838	...	...	...	...	...
0.014 2	1 839	2 759	...	...	...	...	...
0.014 4	1 788	2 683	...	...	...	...	...
0.014 6	1 740	2 610	...	...	...	...	...
0.014 8	1 693	2 540	...	...	...	...	...
0.015 0	1 648	2 473	...	...	...	...	...
0.015 2	1 605	2 408	...	...	...	...	...
0.015 4	1 564	2 346	...	...	...	...	...
0.015 6	1 524	2 286	...	...	...	...	...
0.015 8	1 485	2 229	...	...	...	...	...
0.016 0	1 449	2 173	...	...	...	...	...
0.016 2	1 413	2 120	...	...	...	...	...
0.016 4	1 379	2 068	...	...	...	...	...
0.016 6	1 346	2 019	...	...	...	...	...
0.016 8	1 314	1 971	...	...	...	...	...
0.017 0	1 283	1 925	...	...	...	...	...
0.017 2	1 253	1 881	...	...	...	...	...
0.017 4	1 225	1 838	...	...	...	...	...
0.017 6	1 197	1 796	2 993	...	...	...	...
0.017 8	1 170	1 756	2 926	...	...	...	...
0.018 0	1 145	1 717	2 862	...	...	...	...
0.018 2	1 120	1 680	2 799	...	...	...	...
0.018 4	1 095	1 643	2 739	...	...	...	...
0.018 6	1 072	1 608	2 680	...	...	...	...
0.018 8	1 049	1 574	2 623	...	...	...	...
0.019 0	1 027	1 541	2 568	...	...	...	...
0.019 2	1 006	1 509	2 515	...	...	...	...
0.019 4	985	1 478	2 463	...	...	...	...
0.019 6	965	1 448	2 413	...	...	...	...
0.019 8	946	1 419	2 365	...	...	...	...

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.020 0	927	1 391	2 318	...	...	...	...
0.020 2	909	1 363	2 272	...	...	...	...
0.020 4	891	1 337	2 228	...	...	...	...
0.020 6	874	1 311	2 185	...	...	...	...
0.020 8	857	1 286	2 143	...	...	...	...
0.021 0	841	1 262	2 102	...	...	...	...
0.021 2	825	1 238	2 063	...	...	...	...
0.021 4	810	1 215	2 025	...	...	...	...
0.021 6	795	1 192	1 987	...	...	...	...
0.021 8	780	1 171	1 951	...	...	...	...
0.022 0	766	1 149	1 916	...	...	...	...
0.022 2	752	1 129	1 881	...	...	...	...
0.022 4	739	1 109	1 848	...	...	...	...
0.022 6	726	1 089	1 815	...	...	...	...
0.022 8	713	1 070	1 784	...	...	...	...
0.023 0	701	1 052	1 753	...	...	...	...
0.023 2	689	1 034	1 723	...	...	...	...
0.023 4	677	1 016	1 693	...	...	...	...
0.023 6	666	999	1 665	...	...	...	...
0.023 8	655	982	1 637	...	...	...	...
0.024 0	644	966	1 610	...	...	...	...
0.024 2	633	950	1 583	...	...	...	...
0.024 4	623	934	1 557	...	...	...	...
0.024 6	613	919	1 532	...	...	...	...
0.024 8	603	905	1 507	...	...	...	...
0.025 0	593	890	1 483	2 967	...	...	...
0.025 2	584	876	1 460	2 920	...	...	...
0.025 4	575	862	1 437	2 874	...	...	...
0.025 6	566	849	1 415	2 830	...	...	...
0.025 8	557	836	1 393	2 786	...	...	...
0.026 0	549	823	1 372	2 743	...	...	...
0.026 2	540	810	1 351	2 702	...	...	...
0.026 4	532	798	1 330	2 661	...	...	...
0.026 6	524	786	1 310	2 621	...	...	...
0.026 8	516	775	1 291	2 582	...	...	...
0.027 0	509	763	1 272	2 544	...	...	...
0.027 2	501	752	1 253	2 507	...	...	...
0.027 4	494	741	1 235	2 470	...	...	...
0.027 6	487	730	1 217	2 434	...	...	...
0.027 8	480	720	1 200	2 400	...	...	...
0.028 0	473	710	1 183	2 365	...	...	...
0.028 2	466	700	1 166	2 332	...	...	...
0.028 4	460	690	1 150	2 299	...	...	...
0.028 6	453	680	1 133	2 267	...	...	...
0.028 8	447	671	1 118	2 236	...	...	...

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.029 0	441	662	1 102	2 205	...	...	...
0.029 2	435	652	1 087	2 175	...	...	...
0.029 4	429	644	1 073	2 146	...	...	...
0.029 6	423	635	1 058	2 117	...	...	...
0.029 8	418	626	1 044	2 088	...	...	...
0.030 0	412	618	1 030	2 061	...	...	...
0.030 2	407	610	1 017	2 033	...	...	...
0.030 4	401	602	1 003	2 007	...	...	...
0.030 6	396	594	990	1 981	...	...	...
0.030 8	391	586	977	1 955	...	...	...
0.031 0	386	579	965	1 930	...	...	...
0.031 2	381	572	952	1 905	...	...	...
0.031 4	376	564	940	1 881	...	...	...
0.031 6	371	557	928	1 857	...	...	...
0.031 8	367	550	917	1 834	...	...	...
0.032 0	362	543	905	1 811	...	...	...
0.032 2	358	537	894	1 789	...	...	...
0.032 4	353	530	883	1 767	...	...	...
0.032 6	349	523	872	1 745	...	...	...
0.032 8	345	517	862	1 724	...	...	...
0.033 0	341	511	851	1 703	...	...	...
0.033 2	336	505	841	1 682	...	...	...
0.033 4	332	499	831	1 662	...	...	...
0.033 6	328	493	821	1 643	...	...	...
0.033 8	325	487	812	1 623	...	...	...
0.034 0	321	481	802	1 604	...	...	...
0.034 2	317	476	793	1 586	...	...	...
0.034 4	313	470	783	1 567	...	...	...
0.034 6	310	465	774	1 549	...	...	...
0.034 8	306	459	766	1 531	...	...	...
0.035 0	303	454	757	1 514	...	...	...
0.035 2	299	449	748	1 497	2 993	...	...
0.035 4	296	444	740	1 480	2 959	...	...
0.035 6	293	439	732	1 463	2 926	...	...
0.035 8	289	434	723	1 447	2 893	...	...
0.036 0	286	429	715	1 431	2 861	...	...
0.036 2	283	425	708	1 415	2 830	...	...
0.036 4	280	420	700	1 400	2 799	...	...
0.036 6	277	415	692	1 384	2 768	...	...
0.036 8	274	411	685	1 369	2 738	...	...
0.037 0	271	406	677	1 355	2 709	...	...
0.037 2	268	402	670	1 340	2 680	...	...
0.037 4	265	398	663	1 326	2 651	...	...
0.037 6	262	394	656	1 312	2 623	...	...
0.037 8	260	389	649	1 298	2 595	...	...

Table D.2 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.038 0	257	385	642	1 284	2 568	...	...
0.038 2	254	381	635	1 271	2 541	...	...
0.038 4	251	377	629	1 258	2 515	...	...
0.038 6	249	373	622	1 245	2 489	...	...
0.038 8	246	370	616	1 232	2 463	...	...
0.039 0	244	366	610	1 219	2 438	...	...
0.039 2	241	362	603	1 207	2 413	...	...
0.039 4	239	358	597	1 195	2 389	2 987	...
0.039 6	236	355	591	1 183	2 365	2 957	...
0.039 8	234	351	585	1 171	2 341	2 927	...
0.040 0	232	348	579	1 159	2 318	2 898	...
0.040 2	229	344	574	1 148	2 295	2 869	...
0.040 4	227	341	568	1 136	2 272	2 841	...
0.040 6	225	338	562	1 125	2 250	2 813	...
0.040 8	223	334	557	1 114	2 228	2 785	...
0.041 0	221	331	552	1 103	2 206	2 758	...
0.041 2	218	328	546	1 093	2 185	2 732	...
0.041 4	216	325	541	1 082	2 164	2 705	...
0.041 6	214	321	536	1 072	2 143	2 679	...
0.041 8	212	318	531	1 061	2 122	2 654	...
0.042 0	210	315	526	1 051	2 102	2 629	...
0.042 2	208	312	521	1 041	2 082	2 604	...
0.042 4	206	309	516	1 032	2 063	2 579	...
0.042 6	204	307	511	1 022	2 043	2 555	...
0.042 8	202	304	506	1 012	2 024	2 531	...
0.043 0	201	301	501	1 003	2 006	2 508	...
0.043 2	199	298	497	994	1 987	2 485	2 981
0.043 4	197	295	492	985	1 969	2 462	2 954
0.043 6	195	293	488	976	1 951	2 439	2 927
0.043 8	193	290	483	967	1 933	2 417	2 900
0.044 0	192	287	479	958	1 915	2 395	2 874
0.044 2	190	285	475	949	1 898	2 373	2 848
0.044 4	188	282	470	941	1 881	2 352	2 822
0.044 6	186	280	466	932	1 864	2 331	2 797
0.044 8	185	277	462	924	1 848	2 310	2 772
0.045 0	183	275	458	916	1 831	2 290	2 747
0.045 2	182	272	454	908	1 815	2 270	2 723
0.045 4	180	270	450	900	1 799	2 250	2 699
0.045 6	178	268	446	892	1 783	2 230	2 675
0.045 8	177	265	442	884	1 768	2 210	2 652
0.046 0	175	263	438	876	1 752	2 191	2 629
0.046 2	174	261	434	869	1 737	2 172	2 606
0.046 4	172	258	431	861	1 722	2 154	2 584
0.046 6	171	256	427	854	1 708	2 135	2 562
0.046 8	169	254	423	847	1 693	2 117	2 540

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.047 0	168	252	420	840	1 679	2 099	2 518
0.047 2	166	250	416	832	1 665	2 081	2 497
0.047 4	165	248	413	825	1 650	2 064	2 476
0.047 6	164	246	409	818	1 637	2 046	2 455
0.047 8	162	243	406	812	1 623	2 029	2 435
0.048 0	161	241	402	805	1 609	2 012	2415
0.048 2	160	239	399	798	1 596	1 996	2 395
0.048 4	158	237	396	792	1 583	1 979	2 375
0.048 6	157	236	393	785	1 570	1 963	2 355
0.048 8	156	234	389	779	1 557	1 947	2 336
0.049 0	154	232	386	772	1 544	1 931	2 317
0.049 2	153	230	383	766	1 532	1 915	2 298
0.049 4	152	228	380	760	1 520	1 900	2 280
0.049 6	151	226	377	754	1 507	1 885	2 261
0.049 8	150	224	374	748	1 495	1 870	2 243
0.050 0	148	223	371	742	1 483	1 855	2 225
0.050 2	147	221	368	736	1 472	1 840	2 208
0.050 4	146	219	365	730	1 460	1 825	2 190
0.050 6	145	217	362	724	1 448	1 811	2 173
0.050 8	144	216	359	719	1 437	1 797	2 156
0.051 0	143	214	356	713	1 426	1 783	2 139
0.051 2	141	212	354	707	1 415	1 769	2 122
0.051 4	140	211	351	702	1 404	1 755	2 106
0.051 6	139	209	348	697	1 393	1 741	2 089
0.051 8	138	207	346	691	1 382	1 728	2 073
0.052 0	137	206	343	686	1 371	1 715	2 057
0.052 2	136	204	340	681	1 361	1 702	2 042
0.052 4	135	203	338	675	1 351	1 689	2 026
0.052 6	134	201	335	670	1 340	1 676	2 011
0.052 8	133	200	333	665	1 330	1 663	1 996
0.053 0	132	198	330	660	1 320	1 651	1 981
0.053 2	131	197	328	655	1 310	1 638	1 966
0.053 4	130	195	325	650	1 300	1 626	1 951
0.053 6	129	194	323	646	1 291	1 614	1 936
0.053 8	128	192	320	641	1 281	1 602	1 922
0.054 0	127	191	318	636	1 272	1 590	1 908
0.054 2	126	189	316	631	1 262	1 578	1 894
0.054.4	125	188	313	627	1 253	1 567	1 880
0.054 6	124	187	311	622	1 244	1 555	1 866
0.054 8	123	185	309	618	1 235	1 544	1 853
0.055 0	123	184	306	613	1 226	1 533	1 839
0.055 2	122	183	304	609	1 217	1 522	1 826
0.055 4	121	181	302	604	1 208	1 511	1 813
0.055 6	120	180	300	600	1 200	1 500	1 800
0.055 8	119	179	298	596	1 191	1 489	1 787

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.056 0	118	177	296	591	1 182	1 479	1 774
0.056 2	117	176	294	587	1 174	1 468	1 761
0.056 4	117	175	291	583	1 166	1 458	1 749
0.056 6	116	174	289	579	1 158	1 447	1 737
0.056 8	115	172	287	575	1 149	1 437	1 724
0.057 0	114	171	285	571	1 141	1 427	1 712
0.057 2	113	170	283	567	1 133	1 417	1 700
0.057 4	113	169	281	563	1 125	1 407	1 689
0.057 6	112	168	279	559	1 118	1 398	1 677
0.057 8	111	167	278	555	1 110	1 388	1 665
0.058 0	110	165	276	551	1 102	1 378	1 654
0.058 2	109	164	274	547	1 095	1 369	1 642
0.058 4	109	163	272	544	1 087	1 360	1 631
0.058 6	108	162	270	540	1 080	1 350	1 620
0.058 8	107	161	268	536	1 073	1 341	1 609
0.059 0	107	160	266	533	1 065	1 332	1 598
0.059 2	106	159	265	529	1 058	1 323	1 587
0.059 4	105	158	263	526	1 051	1 314	1 577
0.059 6	104	157	261	522	1 044	1 305	1 566
0.059 8	104	156	259	519	1 037	1 297	1 556
0.060 0	103	155	258	515	1 030	1 288	1 545
0.060 2	102	154	256	512	1 023	1 279	1 535
0.060 4	102	152	254	508	1 016	1 271	1 525
0.060 6	101	151	252	505	1 010	1 263	1 515
0.060 8	100	150	251	502	1 003	1 254	1 505
0.061 0	99.7	150	249	498	997	1 246	1 495
0.061 2	99.0	149	248	495	990	1 238	1 485
0.061 4	98.4	148	246	492	984	1 230	1 476
0.061 6	97.7	147	244	489	977	1 222	1 466
0.061 8	97.1	146	243	486	971	1 214	1 457
0.062 0	96.5	145	241	482	965	1 206	1 447
0.062 2	95.8	144	240	479	958	1 198	1 438
0.062 4	95.2	143	238	476	952	1 191	1 429
0.062 6	94.6	142	237	473	946	1 183	1 420
0.062 8	94.0	141	235	470	940	1 176	1 411
0.063 0	93.4	140	234	467	934	1 168	1 402
0.063 2	92.8	139	232	464	928	1 161	1 393
0.063 4	92.3	138	231	461	923	1 154	1 384
0.063 6	91.7	138	229	458	917	1 146	1 375
0.063 8	91.1	137	228	456	911	1 139	1 367
0.064 0	90.5	136	226	453	905	1 132	1 358
0.064 2	90.0	135	225	450	900	1 125	1 350
0.064 4	89.4	134	224	447	894	1 118	1 341
0.064 6	88.9	133	222	444	889	1 111	1 333
0.064 8	88.3	132	221	442	883	1 104	1 325

Table D.2 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.065 0	87.8	132	219	439	878	1 097	1 317
0.065.2	87.2	131	218	436	872	1 091	1 309
0.065 4	86.7	130	217	434	867	1 084	1 301
0.065 6	86.2	129	215	431	862	1 077	1 293
0.065 8	85.6	128	214	428	856	1 071	1 285
0.066 0	85.1	128	213	426	851	1 064	1 277
0.066 2	84.6	127	212	423	846	1 058	1 269
0.066 4	84.1	126	210	421	841	1 052	1 262
0.066 6	83.6	125	209	418	836	1 045	1 254
0.066 8	83.1	125	208	416	831	1 039	1 247
0.067 0	82.6	124	207	413	826	1 033	1 239
0.067 2	82.1	123	205	411	821	1 027	1 232
0.067 4	81.6	122	204	408	816	1 021	1 225
0.067 6	81.1	122	203	406	811	1 015	1 217
0.067 8	80.7	121	202	403	807	1 009	1 210
0.068 0	80.2	120	201	401	802	1 003	1 203
0.068 2	79.7	120	199	399	797	997	1 196
0.068 4	79.3	119	198	396	793	991	1 189
0.068 6	78.8	118	197	394	788	985	1 182
0.068 8	78.3	118	196	392	783	980	1 175
0.069 0	77.9	117	195	390	779	974	1 169
0.069 2	77.4	116	194	387	774	968	1 162
0.069 4	77.0	116	193	385	770	963	1 155
0.069 6	76.6	115	191	383	766	957	1 148
0.069 8	76.1	114	190	381	761	952	1 142
0.070 0	75.7	114	189	378	757	946	1 135
0.070 5	74.6	112	187	373	746	933	1 119
0.071 0	73.6	110	184	368	736	920	1 104
0.071 5	72.5	109	181	363	725	907	1 088
0.072 0	71.5	107	179	358	715	894	1 073
0.072 5	70.5	106	176	353	705	882	1 058
0.073 0	69.6	104	174	348	696	870	1 044
0.073 5	68.6	103	172	343	686	858	1 030
0.074 0	67.7	102	169	339	677	847	1 016
0.074 5	66.8	100	167	334	668	835	1 002
0.075 0	65.9	99	165	330	659	824	989
0.075 5	65.1	98	163	325	651	813	976
0.076 0	64.2	96	161	321	642	803	963
0.076 5	63.4	95	158	317	634	792	951
0.077 0	62.5	94	156	313	625	782	938
0.077 5	61.7	93	154	309	617	772	926
0.078 0	61.0	91	152	305	610	762	914
0.078 5	60.2	90	150	301	602	752	903
0.079 0	59.4	89	149	297	594	743	891
0.079 5	58.7	88	147	293	587	734	880

Table D.2 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.080 0	57.9	87	145	290	579	724	869
0.080 5	57.2	86	143	286	572	716	859
0.081 0	56.5	85	141	283	565	707	848
0.081 5	55.8	84	140	279	558	698	838
0.082 0	55.1	83	138	276	551	690	827
0.082 5	54.5	81.7	136	272	545	681	817
0.083 0	53.8	80.8	135	269	538	673	808
0.083 5	53.2	79.8	133	266	532	665	798
0.084 0	52.6	78.8	131	263	526	657	788
0.084 5	51.9	77.9	130	260	519	649	779
0.085 0	51.3	77.0	128	257	513	642	770
0.085 5	50.7	76.1	127	254	507	634	761
0.086 0	50.1	75.2	125	251	501	627	752
0.086 5	49.6	74.4	124	248	496	620	744
0.087 0	49.0	73.5	122	245	490	613	735
0.087 5	48.4	72.7	121	242	484	606	727
0.088 0	47.9	71.8	120	239	479	599	718
0.088 5	47.3	71.0	118	237	473	592	710
0.089 0	46.8	70.2	117	234	468	585	702
0.089 5	46.3	69.5	116	232	463	579	695
0.090 0	45.8	68.7	114	229	458	572	687
0.090 5	45.3	67.9	113	226	453	566	679
0.091 0	44.8	67.2	112	224	448	560	672
0.091 5	43.3	66.4	111	222	443	554	664
0.092 0	43.8	65.7	110	219	438	548	657
0.092 5	43.3	65.0	108	217	433	542	650
0.093 0	42.9	64.3	107	214	429	536	643
0.093 5	42.4	63.6	106	212	424	530	636
0.094 0	42.0	63.0	105	210	420	525	630
0.094 5	41.5	62.3	104	208	415	519	623
0.095 0	41.1	61.6	103	205	411	514	616
0.095 5	40.7	61.0	102	203	407	508	610
0.096 0	40.2	60.4	101	201	402	503	604
0.096 5	39.8	59.7	99.6	199	398	498	597
0.097 0	39.4	59.1	98.5	197	394	493	591
0.097 5	39.0	58.5	97.5	195	390	488	585
0.098 0	38.6	57.9	96.5	193	386	483	579
0.098 5	38.2	57.3	95.6	191	382	478	573
0.099 0	37.8	56.8	94.6	189	378	473	568
0.099 5	37.5	56.2	93.6	187	375	468	562

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.100	37.1	55.6	92.7	185	371	464	556
0.101	36.4	54.5	90.9	182	364	455	545
0.102	35.6	53.5	89.1	178	356	446	535
0.103	35.0	52.4	87.4	175	350	437	524
0.104	34.3	51.4	85.7	171	343	429	514
0.105	33.6	50.5	84.1	168	336	421	505
0.106	33.0	49.5	82.5	165	330	413	495
0.107	32.4	48.6	81.0	162	324	405	486
0.108	31.8	47.7	79.5	159	318	398	477
0.109	31.2	46.8	78.0	156	312	390	468
0.110	30.6	46.0	76.6	153	306	383	460
0.111	30.1	45.2	75.3	151	301	376	452
0.112	29.6	44.4	73.9	148	296	370	444
0.113	29.0	43.6	72.6	145	290	363	436
0.114	28.5	42.8	71.3	143	285	357	428
0.115	28.0	42.1	70.1	140	280	351	421
0.116	27.6	41.3	68.9	138	276	345	413
0.117	27.1	40.6	67.7	135	271	339	406
0.118	26.6	40.0	66.6	133	266	333	400
0.119	26.2	39.3	65.5	131	262	327	393
0.120	25.8	38.6	64.4	129	258	322	386
0.121	25.3	38.0	63.3	127	253	317	380
0.122	24.9	37.4	62.3	125	249	312	374
0.123	24.5	36.8	61.3	123	245	306	368
0.124	24.1	36.2	60.3	121	241	302	362
0.125	23.7	35.6	59.3	119	237	297	356
0.126	23.4	35.0	58.4	117	234	292	350
0.127	23.0	34.5	57.5	115	230	287	345
0.128	22.6	34.0	56.6	113	226	283	340
0.129	22.3	33.4	55.7	111	223	279	334
0.130	21.9	32.9	54.9	110	219	274	329
0.131	21.6	32.4	54.0	108	216	270	324
0.132	21.3	31.9	53.2	106	213	266	319
0.133	21.0	31.5	52.4	105	210	262	315
0.134	20.7	31.0	51.6	103	207	258	310
0.135	20.3	30.5	50.9	102	203	254	305
0.136	20.0	30.1	50.1	100	200	251	301
0.137	19.8	29.6	49.4	98.8	198	247	296
0.138	19.5	29.2	48.7	97.4	195	243	292
0.139	19.2	28.8	48.0	96.0	192	240	288
0.140	18.9	28.4	47.3	94.6	189	237	284
0.141	18.7	28.0	46.6	93.3	187	233	280
0.142	18.4	27.6	46.0	92.0	184	230	276
0.143	18.1	27.2	45.3	90.7	181	227	272
0.144	17.9	26.8	44.7	89.4	179	224	268
0.145	17.6	26.5	44.1	88.2	176	221	265

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.146	17.4	26.1	43.5	87.0	174	218	261
0.147	17.2	25.7	42.9	85.8	172	215	257
0.148	16.9	25.4	42.3	84.7	169	212	254
0.149	16.7	25.1	41.8	83.5	167	209	251
0.150	16.5	24.7	41.2	82.4	165	206	247
0.151	16.3	24.4	40.7	81.3	163	203	244
0.152	16.1	24.1	40.1	80.3	161	201	241
0.153	15.8	23.8	39.6	79.2	158	198	238
0.154	15.6	23.5	39.1	78.2	156	196	235
0.155	15.4	23.2	38.6	77.2	154	193	232
0.156	15.2	22.9	38.1	76.2	152	191	229
0.157	15.0	22.6	37.6	75.2	150	188	226
0.158	14.9	22.3	37.1	74.3	149	186	223
0.159	14.7	22.0	36.7	73.4	147	183	220
0.160	14.5	21.7	36.2	72.4	145	181	217
0.161	14.3	21.5	35.8	71.5	143	179	215
0.162	14.1	21.2	35.3	70.7	141	177	212
0.163	14.0	20.9	34.9	69.8	140	175	209
0.164	13.8	20.7	34.5	69.0	138	172	207
0.165	13.6	20.4	34.1	68.1	136	170	204
0.166	13.5	20.2	33.6	67.3	135	168	202
0.167	13.3	19.9	33.2	66.5	133	166	199
0.168	13.1	19.7	32.8	65.7	131	164	197
0.169	13.0	19.5	32.5	64.9	130	162	195
0.170	12.8	19.3	32.1	64.2	128	160	193
0.171	12.7	19.0	31.7	63.4	127	159	190
0.172	12.5	18.8	31.3	62.7	125	157	188
0.173	12.4	18.6	31.0	62.0	124	155	186
0.174	12.2	18.4	30.6	61.3	122	153	184
0.175	12.1	18.2	30.3	60.6	121	151	182
0.176	12.0	18.0	29.9	59.9	120	150	180
0.177	11.8	17.8	29.6	59.2	118	148	178
0.178	11.7	17.6	29.3	58.5	117	146	176
0.179	11.6	17.4	28.9	57.9	116	145	174
0.180	11.4	17.2	28.6	57.2	114	143	172
0.181	11.3	17.0	28.3	56.6	113	142	170
0.182	11.2	16.8	28.0	56.0	112	140	168
0.183	11.1	16.6	27.7	55.4	111	138	166
0.184	11.0	16.4	27.4	54.8	110	137	164
0.185	10.8	16.3	27.1	54.2	108	135	163
0.186	10.7	16.1	26.8	53.6	107	134	161
0.187	10.6	15.9	26.5	53.0	106	133	159
0.188	10.5	15.7	26.2	52.5	105	131	157
0.189	10.4	15.6	26.0	51.9	104	130	156
0.190	10.3	15.4	25.7	51.4	103	128	154

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.191	10.2	15.2	25.4	50.8	102	127	152
0.192	10.1	15.1	25.2	50.3	101	126	151
0.193	9.96	14.9	24.9	49.8	99.6	124	149
0.194	9.85	14.8	24.6	49.3	98.5	123	148
0.195	9.75	14.6	24.4	48.8	97.5	122	146
0.196	9.65	14.5	24.1	48.3	96.5	121	145
0.197	9.56	14.3	23.9	47.8	95.6	119	143
0.198	9.46	14.2	23.6	47.3	94.6	118	142
0.199	9.36	14.0	23.4	46.8	93.6	117	140
0.200	9.27	13.9	23.2	46.4	92.7	116	139
0.201	9.18	13.8	22.9	45.9	91.8	115	138
0.202	9.09	13.6	22.7	45.4	90.9	114	136
0.203	9.00	13.5	22.5	45.0	90.0	113	135
0.204	8.91	13.4	22.3	44.6	89.1	111	134
0.205	8.82	13.2	22.1	44.1	88.2	110	132
0.206	8.74	13.1	21.8	43.7	87.4	109	131
0.207	8.65	13.0	21.6	43.3	86.5	108	130
0.208	8.57	12.9	21.4	42.9	85.7	107	129
0.209	8.49	12.7	21.2	42.5	84.9	106	127
0.210	8.41	12.6	21.0	42.1	84.1	105	126
0.211	8.33	12.5	20.8	41.7	83.3	104	125
0.212	8.25	12.4	20.6	41.3	82.5	103	124
0.213	8.17	12.3	20.4	40.9	81.7	102	123
0.214	8.10	12.1	20.2	40.5	81.0	101	121
0.215	8.02	12.0	20.1	40.1	80.2	100	120
0.216	7.95	11.9	19.9	39.7	79.5	99.4	119
0.217	7.87	11.8	19.7	39.4	78.7	98.5	118
0.218	7.80	11.7	19.5	39.0	78.0	97.6	117
0.219	7.73	11.6	19.3	38.7	77.3	96.7	116
0.220	7.66	11.5	19.2	38.3	76.6	95.8	115
0.221	7.59	11.4	19.0	38.0	75.9	94.9	114
0.222	7.52	11.3	18.8	37.6	75.2	94.1	113
0.223	7.46	11.2	18.6	37.3	74.6	93.2	112
0.224	7.39	11.1	18.5	37.0	73.9	92.4	111
0.225	7.32	11.0	18.3	36.6	73.2	91.6	110
0.226	7.26	10.9	18.2	36.3	72.6	90.8	109
0.227	7.20	10.8	18.0	36.0	72.0	90.0	108
0.228	7.13	10.7	17.8	35.7	71.3	89.2	107
0.229	7.07	10.6	17.7	35.4	70.7	88.4	106
0.230	7.01	10.5	17.5	35.1	70.1	87.7	105
0.231	6.95	10.4	17.4	34.8	69.5	86.9	104
0.232	6.89	10.3	17.2	34.5	68.9	86.1	103
0.233	6.88	10.2	17.1	34.2	68.3	85.4	102
0.234	6.77	10.2	16.9	33.9	67.7	84.7	102
0.235	6.71	10.1	16.8	33.6	67.1	84.0	101

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.236	6.66	9.99	16.6	33.3	66.6	83.3	99.9
0.237	6.60	9.90	16.5	33.0	66.0	82.5	99.0
0.238	6.55	9.82	16.4	32.7	65.5	81.9	98.2
0.239	6.49	9.74	16.2	32.5	64.9	81.2	97.4
0.240	6.44	9.66	16.1	32.2	64.4	80.5	96.6
0.241	6.38	9.58	16.0	31.9	63.8	79.8	95.8
0.242	6.33	9.50	15.8	31.7	63.3	79.2	95.0
0.243	6.28	9.42	15.7	31.4	62.8	78.5	94.2
0.244	6.23	9.34	15.6	31.1	62.3	77.9	93.4
0.245	6.18	9.27	15.4	30.9	61.8	77.2	92.7
0.246	6.13	9.19	15.3	30.6	61.3	76.6	91.9
0.247	6.08	9.12	15.2	30.4	60.8	76.0	91.2
0.248	6.03	9.05	15.1	30.2	60.3	75.4	90.5
0.249	5.98	8.97	15.0	29.9	59.8	74.8	89.7
0.250	5.93	8.90	14.8	29.7	59.3	74.2	89.0
0.251	5.89	8.83	14.7	29.4	58.9	73.6	88.3
0.252	5.84	8.76	14.6	29.2	58.4	73.0	87.6
0.253	5.79	8.69	14.5	29.0	57.9	72.4	86.9
0.254	5.75	8.62	14.4	28.7	57.5	71.9	86.2
0.255	5.70	8.56	14.3	28.5	57.0	71.3	85.6
0.256	5.66	8.49	14.1	28.3	56.6	70.8	84.9
0.257	5.61	8.42	14.0	28.1	56.1	70.2	84.2
0.258	5.57	8.36	13.9	27.9	55.7	69.7	83.6
0.259	5.53	8.29	13.8	27.6	55.3	69.1	82.9
0.260	5.49	8.23	13.7	27.4	54.9	68.6	82.3
0.261	5.44	8.17	13.6	27.2	54.4	68.1	81.7
0.262	5.40	8.10	13.5	27.0	54.0	67.5	81.0
0.263	5.36	8.04	13.4	26.8	53.6	67.0	80.4
0.264	5.32	7.98	13.3	26.6	53.2	66.5	79.8
0.265	5.28	7.92	13.2	26.4	52.8	66.0	79.2
0.266	5.24	7.86	13.1	26.2	52.4	65.5	78.6
0.267	5.20	7.80	13.0	26.0	52.0	65.0	78.0
0.268	5.16	7.75	12.9	25.8	51.6	64.6	77.5
0.269	5.12	7.69	12.8	25.6	51.2	64.1	76.9
0.270	5.09	7.63	12.7	25.4	50.9	63.6	76.3
0.271	5.05	7.58	12.6	25.3	50.5	63.1	75.8
0.272	5.01	7.52	12.5	25.1	50.1	62.7	75.2
0.273	4.98	7.46	12.4	24.9	49.8	62.2	74.6
0.274	4.94	7.41	12.3	24.7	49.4	61.8	74.1
0.275	4.90	7.36	12.3	24.5	49.0	61.3	73.6
0.276	...	7.30	12.2	24.3	48.7	60.9	73.0
0.277	...	7.25	12.1	24.2	48.3	60.4	72.5
0.278	...	7.20	12.0	24.0	48.0	60.0	72.0
0.279	...	7.15	11.9	23.8	47.6	59.6	71.5
0.280	...	7.10	11.8	23.7	47.3	59.1	71.0

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.281	...	7.05	11.7	23.5	47.0	58.7	70.5
0.282	...	7.00	11.7	23.3	46.6	58.3	70.0
0.283	...	6.95	11.6	23.2	46.3	57.9	69.5
0.284	...	6.90	11.5	23.0	46.0	57.5	69.0
0.285	...	6.85	11.4	22.8	45.7	57.1	68.5
0.286	...	6.80	11.3	22.7	45.3	56.7	68.0
0.287	...	6.75	11.3	22.5	45.0	56.3	67.5
0.288	...	6.71	11.2	22.4	44.7	55.9	67.1
0.289	...	6.66	11.1	22.2	44.4	55.5	66.6
0.290	...	6.62	11.0	22.1	44.1	55.1	66.2
0.291	...	6.57	10.9	21.9	43.8	54.8	65.7
0.292	...	6.52	10.9	21.8	43.5	54.4	65.2
0.293	...	6.48	10.8	21.6	43.2	54.0	64.8
0.294	...	6.44	10.7	21.5	42.9	53.6	64.4
0.295	...	6.39	10.7	21.3	42.6	53.3	63.9
0.296	...	6.35	10.6	21.2	42.3	52.9	63.5
0.297	...	6.31	10.5	21.0	42.0	52.6	63.1
0.298	...	6.26	10.4	20.9	41.8	52.2	62.6
0.299	...	6.22	10.4	20.7	41.5	51.9	62.2
0.300	...	6.18	10.3	20.6	41.2	51.5	61.8
0.301	...	6.14	10.2	20.5	40.9	51.2	61.4
0.302	...	6.10	10.2	20.3	40.7	50.8	61.0
0.303	...	6.06	10.1	20.2	40.4	50.5	60.6
0.304	...	6.02	10.0	20.1	40.1	50.2	60.2
0.305	...	5.98	9.97	19.9	39.9	49.8	59.8
0.306	...	5.94	9.90	19.8	39.6	49.5	59.4
0.307	...	5.90	9.84	19.7	39.3	49.2	59.0
0.308	...	5.86	9.77	19.5	39.1	48.9	58.6
0.309	...	5.83	9.71	19.4	38.8	48.6	58.3
0.310	...	5.79	9.65	19.3	38.6	48.2	57.9
0.311	...	5.75	9.59	19.2	38.3	47.9	57.5
0.312	...	5.72	9.52	19.1	38.1	47.6	57.2
0.313	...	5.68	9.46	18.9	37.9	47.3	56.8
0.314	...	5.64	9.40	18.8	37.6	47.0	56.4
0.315	...	5.61	9.34	18.7	37.4	46.7	56.1
0.316	...	5.57	9.28	18.6	37.1	46.4	55.7
0.317	...	5.54	9.23	18.5	36.9	46.1	55.4
0.318	...	5.50	9.17	18.3	36.7	45.9	55.0
0.319	...	5.47	9.11	18.2	36.4	45.6	54.7
0.320	...	5.43	9.05	18.1	36.2	45.3	54.3
0.321	...	5.40	9.00	18.0	36.0	45.0	54.0
0.322	...	5.37	8.94	17.9	35.8	44.7	53.7
0.323	...	5.33	8.89	17.8	35.5	44.4	53.3
0.324	...	5.30	8.83	17.7	35.3	44.2	53.0
0.325	...	5.27	8.78	17.6	35.1	43.9	52.7

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.326	...	5.23	8.72	17.4	34.9	43.6	52.3
0.327	...	5.20	8.67	17.3	34.7	43.4	52.0
0.328	...	5.17	8.62	17.2	34.5	43.1	51.7
0.329	...	5.14	8.57	17.1	34.3	42.8	51.4
0.330	...	5.11	8.51	17.0	34.1	42.6	51.1
0.331	...	5.08	8.46	16.9	33.8	42.3	50.8
0.332	...	5.05	8.41	16.8	33.6	42.1	50.5
0.333	...	5.02	8.36	16.7	33.4	41.8	50.2
0.334	...	4.99	8.31	16.6	33.2	41.6	49.9
0.335	...	4.96	8.26	16.5	33.0	41.3	49.6
0.336	...	4.93	8.21	16.4	32.8	41.1	49.3
0.337	8.16	16.3	32.7	40.8	49.0
0.338	8.12	16.2	32.5	40.6	48.7
0.339	8.07	16.1	32.3	40.3	48.4
0.340	8.02	16.0	32.1	40.1	48.1
0.341	7.97	15.9	31.9	39.9	47.8
0.342	7.93	15.9	31.7	39.6	47.6
0.343	7.88	15.8	31.5	39.4	47.3
0.344	7.83	15.7	31.3	39.2	47.0
0.345	7.79	15.6	31.2	39.0	46.7
0.346	7.74	15.5	31.0	38.7	46.5
0.347	7.70	15.4	30.8	38.5	46.2
0.348	7.66	15.3	30.6	38.3	45.9
0.349	7.61	15.2	30.4	38.1	45.7
0.350	7.57	15.1	30.3	37.9	45.4
0.351	7.53	15.1	30.1	37.6	45.2
0.352	7.48	15.0	29.9	37.4	44.9
0.353	7.44	14.9	29.8	37.2	44.6
0.354	7.40	14.8	29.6	37.0	44.4
0.355	7.36	14.7	29.4	36.8	44.1
0.356	7.32	14.6	29.3	36.6	43.9
0.357	7.27	14.6	29.1	36.4	43.7
0.358	7.23	14.5	28.9	36.2	43.4
0.359	7.19	14.4	28.8	36.0	43.2
0.360	7.15	14.3	28.6	35.8	42.9
0.361	7.11	14.2	28.5	35.6	42.7
0.362	7.08	14.2	28.3	35.4	42.5
0.363	7.04	14.1	28.1	35.2	42.2
0.364	7.00	14.0	28.0	35.0	42.0
0.365	6.96	13.9	27.8	34.8	41.8
0.366	6.92	13.8	27.7	34.6	41.5
0.367	6.88	13.8	27.5	34.4	41.3
0.368	6.85	13.7	27.4	34.2	41.1
0.369	6.81	13.6	27.2	34.1	40.9
0.370	6.77	13.5	27.1	33.9	40.6

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.371	6.74	13.5	26.9	33.7	40.4
0.372	6.70	13.4	26.8	33.5	40.2
0.373	6.66	13.3	26.7	33.3	40.0
0.374	6.63	13.3	26.5	33.1	39.8
0.375	6.59	13.2	26.4	33.0	39.6
0.376	6.56	13.1	26.2	32.8	39.4
0.377	6.52	13.0	26.1	32.6	39.1
0.378	6.49	13.0	26.0	32.5	38.9
0.379	6.45	12.9	25.8	32.3	38.7
0.380	6.42	12.8	25.7	32.1	38.5
0.381	6.39	12.8	25.5	31.9	38.3
0.382	6.35	12.7	25.4	31.8	38.1
0.383	6.32	12.6	25.3	31.6	37.9
0.384	6.29	12.6	25.1	31.4	37.7
0.385	6.26	12.5	25.0	31.3	37.5
0.386	6.22	12.4	24.9	31.1	37.3
0.387	6.19	12.4	24.8	31.0	37.1
0.388	6.16	12.3	24.6	30.8	37.0
0.389	6.13	12.3	24.5	30.6	36.8
0.390	6.10	12.2	24.4	30.5	36.6
0.391	6.06	12.1	24.3	30.3	36.4
0.392	6.03	12.1	24.1	30.2	36.2
0.393	6.00	12.0	24.0	30.0	36.0
0.394	5.97	11.9	23.9	29.9	35.8
0.395	5.94	11.9	23.8	29.7	35.7
0.396	5.91	11.8	23.6	29.6	35.5
0.397	5.88	11.8	23.5	29.4	35.3
0.398	5.85	11.7	23.4	29.3	35.1
0.399	5.82	11.6	23.3	29.1	34.9
0.400	5.79	11.6	23.2	29.0	34.8
0.401	5.77	11.5	23.1	28.8	34.6
0.402	5.74	11.5	22.9	28.7	34.4
0.403	5.71	11.4	22.8	28.5	34.3
0.404	5.68	11.4	22.7	28.4	34.1
0.405	5.65	11.3	22.6	28.3	33.9
0.406	5.62	11.3	22.5	28.1	33.8
0.407	5.60	11.2	22.4	28.0	33.6
0.408	5.57	11.1	22.3	27.9	33.4
0.409	5.54	11.1	22.2	27.7	33.3
0.410	5.52	11.0	22.1	27.6	33.1
0.411	5.49	11.0	22.0	27.4	32.9
0.412	5.46	10.9	21.8	27.3	32.8
0.413	5.44	10.9	21.7	27.2	32.6
0.414	5.41	10.8	21.6	27.1	32.5
0.415	5.38	10.8	21.5	26.9	32.3

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.416	5.36	10.7	21.4	26.8	32.1
0.417	5.33	10.7	21.3	26.7	32.0
0.418	5.31	10.6	21.2	26.5	31.8
0.419	5.28	10.6	21.1	26.4	31.7
0.420	5.26	10.5	21.0	26.3	31.5
0.421	5.23	10.5	20.9	26.2	31.4
0.422	5.21	10.4	20.8	26.0	31.2
0.423	5.18	10.4	20.7	25.9	31.1
0.424	5.16	10.3	20.6	25.8	30.9
0.425	5.13	10.3	20.5	25.7	30.8
0.426	5.11	10.2	20.4	25.6	30.7
0.427	5.09	10.2	20.3	25.4	30.5
0.428	5.06	10.1	20.2	25.3	30.4
0.429	5.04	10.1	20.1	25.2	30.2
0.430	5.01	10.0	20.1	25.1	30.1
0.431	4.99	9.98	20.0	25.0	29.9
0.432	4.97	9.94	19.9	24.8	29.8
0.433	4.95	9.89	19.8	24.7	29.7
0.434	4.92	9.85	19.7	24.6	29.5
0.435	4.90	9.80	19.6	24.5	29.4
0.436	9.76	19.5	24.4	29.3
0.437	9.71	19.4	24.3	29.1
0.438	9.67	19.3	24.2	29.0
0.439	9.62	19.2	24.1	28.9
0.440	9.58	19.2	24.0	28.7
0.441	9.54	19.1	23.8	28.6
0.442	9.49	19.0	23.7	28.5
0.443	9.45	18.9	23.6	28.3
0.444	9.41	18.8	23.5	28.2
0.445	9.36	18.7	23.4	28.1
0.446	9.32	18.6	23.3	28.0
0.447	9.28	18.6	23.2	27.8
0.448	9.24	18.5	23.1	27.7
0.449	9.20	18.4	23.0	27.6
0.450	9.16	18.3	22.9	27.5
0.451	9.12	18.2	22.8	27.4
0.452	9.08	18.2	22.7	27.2
0.453	9.04	18.1	22.6	27.1
0.454	9.00	18.0	22.5	27.0
0.455	8.96	17.9	22.4	26.9
0.456	8.92	17.8	22.3	26.8
0.457	8.88	17.8	22.2	26.6
0.458	8.84	17.7	22.1	26.5
0.459	8.80	17.6	22.0	26.4
0.460	8.76	17.5	21.9	26.3

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.461	8.73	17.4	21.8	26.2
0.462	8.69	17.4	21.7	26.1
0.463	8.65	17.3	21.6	26.0
0.464	8.61	17.2	21.5	25.8
0.465	8.58	17.1	21.4	25.7
0.466	8.54	17.1	21.4	25.6
0.467	8.50	17.0	21.3	25.5
0.468	8.47	16.9	21.2	25.4
0.469	8.43	16.9	21.1	25.3
0.470	8.40	16.8	21.0	25.2
0.471	8.36	16.7	20.9	25.1
0.472	8.32	16.6	20.8	25.0
0.473	8.29	16.6	20.7	24.9
0.474	8.25	16.5	20.6	24.8
0.475	8.22	16.4	20.6	24.7
0.476	8.18	16.4	20.5	24.6
0.477	8.15	16.3	20.4	24.5
0.478	8.12	16.2	20.3	24.3
0.479	8.08	16.2	20.2	24.2
0.480	8.05	16.1	20.1	24.1
0.481	8.02	16.0	20.0	24.0
0.482	7.98	16.0	20.0	23.9
0.483	7.95	15.9	19.9	23.8
0.484	7.92	15.8	19.8	23.7
0.485	7.88	15.8	19.7	23.7
0.486	7.85	15.7	19.6	23.6
0.487	7.82	15.6	19.6	23.5
0.488	7.79	15.6	19.5	23.4
0.489	7.76	15.5	19.4	23.3
0.490	7.72	15.4	19.3	23.2
0.491	7.69	15.4	19.2	23.1
0.492	7.66	15.3	19.2	23.0
0.493	7.63	15.3	19.1	22.9
0.494	7.60	15.2	19.0	22.8
0.495	7.57	15.1	18.9	22.7
0.496	7.54	15.1	18.8	22.6
0.497	7.51	15.0	18.8	22.5
0.498	7.48	15.0	18.7	22.4
0.499	7.45	14.9	18.6	22.3
0.500	7.42	14.8	18.5	22.3
0.501	7.39	14.8	18.5	22.2
0.502	7.36	14.7	18.4	22.1
0.503	7.33	14.7	18.3	22.0
0.504	7.30	14.6	18.3	21.9
0.505	7.27	14.5	18.2	21.8

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.506	7.24	14.5	18.1	21.7
0.507	7.21	14.4	18.0	21.6
0.508	7.19	14.4	18.0	21.6
0.509	7.16	14.3	17.9	21.5
0.510	7.13	14.3	17.8	21.4
0.511	7.10	14.2	17.8	21.3
0.512	7.07	14.1	17.7	21.2
0.513	7.05	14.1	17.6	21.1
0.514	7.02	14.0	17.6	21.1
0.515	6.99	14.0	17.5	21.0
0.516	6.97	13.9	17.4	20.9
0.517	6.94	13.9	17.3	20.8
0.518	6.91	13.8	17.3	20.7
0.519	6.88	13.8	17.2	20.7
0.520	6.86	13.7	17.1	20.6
0.521	6.83	13.7	17.1	20.5
0.522	6.81	13.6	17.0	20.4
0.523	6.78	13.6	17.0	20.3
0.524	6.75	13.5	16.9	20.3
0.525	6.73	13.5	16.8	20.2
0.526	6.70	13.4	16.8	20.1
0.527	6.68	13.4	16.7	20.0
0.528	6.65	13.3	16.6	20.0
0.529	6.63	13.3	16.6	19.9
0.530	6.60	13.2	16.5	19.8
0.531	6.58	13.2	16.4	19.7
0.532	6.55	13.1	16.4	19.7
0.533	6.53	13.1	16.3	19.6
0.534	6.50	13.0	16.3	19.5
0.535	6.48	13.0	16.2	19.4
0.536	6.46	12.9	16.1	19.4
0.537	6.43	12.9	16.1	19.3
0.538	6.41	12.8	16.0	19.2
0.539	6.38	12.8	16.0	19.1
0.540	6.36	12.7	15.9	19.1
0.541	6.34	12.7	15.8	19.0
0.542	6.31	12.6	15.8	18.9
0.543	6.29	12.6	15.7	18.9
0.544	6.27	12.5	15.7	18.8
0.545	6.24	12.5	15.6	18.7
0.546	6.22	12.4	15.6	18.7
0.547	6.20	12.4	15.5	18.6
0.548	6.18	12.3	15.4	18.5
0.549	6.15	12.3	15.4	18.5
0.550	6.13	12.3	15.3	18.4

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.551	6.11	12.2	15.3	18.3
0.552	6.09	12.2	15.2	18.3
0.553	6.06	12.1	15.2	18.2
0.554	6.04	12.1	15.1	18.1
0.555	6.02	12.0	15.1	18.1
0.556	6.00	12.0	15.0	18.0
0.557	5.98	12.0	14.9	17.9
0.558	5.96	11.9	14.9	17.9
0.559	5.93	11.9	14.8	17.8
0.560	5.91	11.8	14.8	17.7
0.561	5.89	11.8	14.7	17.7
0.562	5.87	11.7	14.7	17.6
0.563	5.85	11.7	14.6	17.6
0.564	5.83	11.7	14.6	17.5
0.565	5.81	11.6	14.5	17.4
0.566	5.79	11.6	14.5	17.4
0.567	5.77	11.5	14.4	17.3
0.568	5.75	11.5	14.4	17.2
0.569	5.73	11.5	14.3	17.2
0.570	5.71	11.4	14.3	17.1
0.571	5.69	11.4	14.2	17.1
0.572	5.67	11.3	14.2	17.0
0.573	5.65	11.3	14.1	16.9
0.574	5.63	11.3	14.1	16.9
0.575	5.61	11.2	14.0	16.8
0.576	5.59	11.2	14.0	16.8
0.577	5.57	11.1	13.9	16.7
0.578	5.55	11.1	13.9	16.7
0.579	5.53	11.1	13.8	16.6
0.580	5.51	11.0	13.8	16.5
0.581	5.49	11.0	13.7	16.5
0.582	5.47	10.9	13.7	16.4
0.583	5.46	10.9	13.6	16.4
0.584	5.44	10.9	13.6	16.3
0.585	5.42	10.8	13.5	16.3
0.586	5.40	10.8	13.5	16.2
0.587	5.38	10.8	13.5	16.1
0.588	5.36	10.7	13.4	16.1
0.589	5.35	10.7	13.4	16.0
0.590	5.33	10.7	13.3	16.0
0.591	5.31	10.6	13.3	15.9
0.592	5.29	10.6	13.2	15.9
0.593	5.27	10.5	13.2	15.8
0.594	5.26	10.5	13.1	15.8
0.595	5.24	10.5	13.1	15.7

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.596	5.22	10.4	13.1	15.7
0.597	5.20	10.4	13.0	15.6
0.598	5.19	10.4	13.0	15.6
0.599	5.17	10.3	12.9	15.5
0.600	5.15	10.3	12.9	15.5
0.601	5.13	10.3	12.8	15.4
0.602	5.12	10.2	12.8	15.4
0.603	5.10	10.2	12.8	15.3
0.604	5.08	10.2	12.7	15.2
0.605	5.07	10.1	12.7	15.2
0.606	5.05	10.1	12.6	15.1
0.607	5.03	10.1	12.6	15.1
0.608	5.02	10.0	12.5	15.0
0.609	5.00	10.0	12.5	15.0
0.610	4.98	9.97	12.5	15.0
0.611	4.97	9.93	12.4	14.9
0.612	4.95	9.90	12.4	14.9
0.613	4.94	9.87	12.3	14.8
0.614	4.92	9.84	12.3	14.8
0.615	4.90	9.80	12.3	14.7
0.616	9.77	12.2	14.7
0.617	9.74	12.2	14.6
0.618	9.71	12.1	14.6
0.619	9.68	12.1	14.5
0.620	9.65	12.1	14.5
0.621	9.62	12.0	14.4
0.622	9.58	12.0	14.4
0.623	9.55	11.9	14.3
0.624	9.52	11.9	14.3
0.625	9.49	11.9	14.2
0.626	9.46	11.8	14.2
0.627	9.43	11.8	14.2
0.628	9.40	11.8	14.1
0.629	9.37	11.7	14.1
0.630	9.34	11.7	14.0
0.631	9.31	11.6	14.0
0.632	9.28	11.6	13.9
0.633	9.25	11.6	13.9
0.634	9.23	11.5	13.8
0.635	9.20	11.5	13.8
0.636	9.17	11.5	13.8
0.637	9.14	11.4	13.7
0.638	9.11	11.4	13.7
0.639	9.08	11.4	13.6
0.640	9.05	11.3	13.6

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.641	9.03	11.3	13.5
0.642	9.00	11.2	13.5
0.643	8.97	11.2	13.5
0.644	8.94	11.2	13.4
0.645	8.91	11.1	13.4
0.646	8.89	11.1	13.3
0.647	8.86	11.1	13.3
0.648	8.83	11.0	13.2
0.649	8.80	11.0	13.2
0.050	8.78	11.0	13.2
0.651	8.75	10.9	13.1
0.652	8.72	10.9	13.1
0.653	8.70	10.9	13.0
0.654	8.67	10.8	13.0
0.655	8.64	10.8	13.0
0.656	8.62	10.8	12.9
0.657	8.59	10.7	12.9
0.658	8.56	10.7	12.8
0.659	8.54	10.7	12.8
0.660	8.51	10.6	12.8
0.661	8.49	10.6	12.7
0.662	8.46	10.6	12.7
0.663	8.44	10.5	12.7
0.664	8.41	10.5	12.6
0.665	8.39	10.5	12.6
0.666	8.36	10.5	12.5
0.667	8.34	10.4	12.5
0.668	8.31	10.4	12.5
0.669	8.29	10.4	12.4
0.670	8.26	10.3	12.4
0.671	8.24	10.3	12.4
0.672	8.21	10.3	12.3
0.673	8.19	10.2	12.3
0.674	8.16	10.2	12.2
0.675	8.14	10.2	12.2
0.676	8.11	10.1	12.2
0.677	8.09	10.1	12.1
0.678	8.07	10.1	12.1
0.679	8.04	10.1	12.1
0.680	8.02	10.0	12.0
0.681	8.00	10.0	12.0
0.682	7.97	9.97	12.0
0.683	7.95	9.94	11.9
0.684	7.93	9.91	11.9
0.685	7.90	9.88	11.9

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.686	7.88	9.85	11.8
0.687	7.86	9.82	11.8
0.688	7.83	9.80	11.8
0.689	7.81	9.77	11.7
0.690	7.79	9.74	11.7
0.691	7.77	9.71	11.7
0.692	7.74	9.68	11.6
0.693	7.72	9.65	11.6
0.694	7.70	9.63	11.6
0.695	7.68	9.60	11.5
0.696	7.66	9.57	11.5
0.697	7.63	9.54	11.5
0.698	7.61	9.52	11.4
0.699	7.59	9.49	11.4
0.700	7.57	9.46	11.4
0.701	7.55	9.44	11.3
0.702	7.52	9.41	11.3
0.703	7.50	9.38	11.3
0.704	7.48	9.36	11.2
0.705	7.46	9.33	11.2
0.706	7.44	9.30	11.2
0.707	7.42	9.28	11.1
0.708	7.40	9.25	11.1
0.709	7.38	9.22	11.1
0.710	7.36	9.20	11.0
0.711	7.34	9.17	11.0
0.712	7.31	9.15	11.0
0.713	7.29	9.12	10.9
0.714	7.27	9.10	10.9
0.715	7.25	9.07	10.9
0.716	7.23	9.04	10.9
0.717	7.21	9.02	10.8
0.718	7.19	8.99	10.8
0.719	7.17	8.97	10.8
0.720	7.15	8.94	10.7
0.721	7.13	8.92	10.7
0.722	7.11	8.89	10.7
0.723	7.09	8.87	10.6
0.724	7.07	8.85	10.6
0.725	7.05	8.82	10.6
0.726	7.04	8.80	10.6
0.727	7.02	8.77	10.5
0.728	7.00	8.75	10.5
0.729	6.98	8.72	10.5
0.730	6.96	8.70	10.4

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.731	6.94	8.68	10.4
0.732	6.92	8.65	10.4
0.733	6.90	8.63	10.4
0.734	6.88	8.61	10.3
0.735	6.86	8.58	10.3
0.736	6.85	8.56	10.3
0.737	6.83	8.54	10.2
0.738	6.81	8.51	10.2
0.739	6.79	8.49	10.2
0.740	6.77	8.47	10.2
0.741	6.75	8.44	10.1
0.742	6.74	8.42	10.1
0.743	6.72	8.40	10.1
0.744	6.70	8.38	10.1
0.745	6.68	8.35	10.0
0.746	6.66	8.33	10.0
0.747	6.65	8.31	9.97
0.748	6.63	8.29	9.94
0.749	6.61	8.27	9.92
0.750	6.59	8.24	9.89
0.751	6.57	8.22	9.86
0.752	6.56	8.20	9.84
0.753	6.54	8.18	9.81
0.754	6.52	8.16	9.79
0.755	6.51	8.13	9.76
0.756	6.49	8.11	9.73
0.757	6.47	8.09	9.71
0.758	6.45	8.07	9.68
0.759	6.44	8.05	9.66
0.760	6.42	8.03	9.63
0.761	6.40	8.01	9.61
0.762	6.39	7.99	9.58
0.763	6.37	7.96	9.56
0.764	6.35	7.94	9.53
0.765	6.34	7.92	9.51
0.766	6.32	7.90	9.48
0.767	6.30	7.88	9.46
0.768	6.29	7.86	9.43
0.769	6.27	7.84	9.41
0.770	6.25	7.82	9.38
0.771	6.24	7.80	9.36
0.772	6.22	7.78	9.33
0.773	6.21	7.76	9.31
0.774	6.19	7.74	9.29
0.775	6.17	7.72	9.26

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.776	6.16	7.70	9.24
0.777	6.14	7.68	9.21
0.778	6.13	7.66	9.19
0.779	6.11	7.64	9.17
0.780	6.10	7.62	9.14
0.781	6.08	7.60	9.12
0.782	6.06	7.58	9.10
0.783	6.05	7.56	9.07
0.784	6.03	7.54	9.05
0.785	6.02	7.52	9.03
0.786	6.00	7.51	9.01
0.787	5.99	7.49	8.98
0.788	5.97	7.47	8.96
0.789	5.96	7.45	8.94
0.790	5.94	7.43	8.91
0.791	5.93	7.41	8.89
0.792	5.91	7.39	8.87
0.793	5.90	7.37	8.85
0.794	5.88	7.35	8.82
0.795	5.87	7.34	8.80
0.796	5.85	7.32	8.78
0.797	5.84	7.30	8.76
0.798	5.82	7.28	8.74
0.799	5.81	7.26	8.71
0.800	5.79	7.24	8.69
0.801	5.78	7.23	8.67
0.802	5.77	7.21	8.65
0.803	5.75	7.19	8.63
0.804	5.74	7.17	8.61
0.805	5.72	7.16	8.59
0.806	5.71	7.14	8.56
0.807	5.69	7.12	8.54
0.808	5.68	7.10	8.52
0.809	5.67	7.08	8.50
0.810	5.65	7.07	8.48
0.811	5.64	7.05	8.46
0.812	5.62	7.03	8.44
0.813	5.61	7.02	8.42
0.814	5.60	7.00	8.40
0.815	5.58	6.98	8.38
0.816	5.57	6.96	8.36
0.817	5.56	6.95	8.33
0.818	5.54	6.93	8.31
0.819	5.53	6.91	8.29
0.820	5.51	6.90	8.27

Table D.2 (continued)

Mean diagonal of indentation d mm	Test force F (N)						
	1.961	2.942	4.903	9.807	19.61	24.52	29.42
	Vickers hardness						
	HV 0.2	HV 0.3	HV 0.5	HV 1	HV 2	HV 2.5	HV 3
0.821	5.50	6.88	8.25
0.822	5.49	6.86	8.23
0.823	5.47	6.85	8.21
0.824	5.46	6.83	8.19
0.825	5.45	6.81	8.17
0.826	5.44	6.80	8.15
0.827	5.42	6.78	8.13
0.828	5.41	6.76	8.11
0.829	5.40	6.75	8.10
0.830	5.38	6.73	8.08
0.831	5.37	6.71	8.06
0.832	5.36	6.70	8.04
0.833	5.34	6.68	8.02
0.834	5.33	6.67	8.00
0.835	5.32	6.65	7.98
0.836	5.31	6.63	7.96
0.837	5.29	6.62	7.94
0.838	5.28	6.60	7.92
0.839	5.27	6.59	7.90
0.840	5.26	6.57	7.88
0.841	5.24	6.56	7.87
0.842	5.23	6.54	7.85
0.843	5.22	6.52	7.83
0.844	5.21	6.51	7.81
0.845	5.19	6.49	7.79
0.846	5.18	6.48	0.77
0.847	5.17	6.46	0.75
0.848	5.16	6.45	7.74
0.849	5.14	6.43	7.72
0.850	5.13	6.42	7.70

Table D.3 HV5 – HV100 (*d*: 0.056 mm to 1.999 mm)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.056	2 957	...	...	...	...	...
0.057	2 854	...	...	...	...	...
0.058	2 756	...	...	...	...	...
0.059	2 663	...	...	...	...	...
0.060	2 575	...	...	...	...	...
0.061	2 492	...	...	...	...	...
0.062	2 412	...	...	...	...	...
0.063	2 336	...	...	...	...	...
0.064	2 264	...	...	...	...	...
0.065	2 194	...	...	...	...	...
0.066	2 128	...	...	...	...	...
0.067	2 065	...	...	...	...	...
0.068	2 005	...	...	...	...	...
0.069	1 947	...	...	...	...	...
0.070	1 892	...	...	...	...	...
0.071	1 839	...	...	...	...	...
0.072	1 788	...	...	...	...	...
0.073	1 740	...	...	...	...	...
0.074	1 693	...	...	...	...	...
0.075	1 648	...	...	...	...	...
0.076	1 605	...	...	...	...	...
0.077	1 564	...	...	...	...	...
0.078	1 524	...	...	...	...	...
0.079	1 486	2 971	...	...	...	...
0.080	1 449	2 898	...	...	...	...
0.081	1 413	2 827	...	...	...	...
0.082	1 379	2 758	...	...	...	...
0.083	1 346	2 692	...	...	...	...
0.084	1 314	2 628	...	...	...	...
0.085	1 283	2 567	...	...	...	...
0.086	1 254	2 507	...	...	...	...
0.087	1 225	2 450	...	...	...	...
0.088	1 197	2 395	...	...	...	...
0.089	1 171	2 341	...	...	...	...
0.090	1 145	2 290	...	...	...	...
0.091	1 120	2 239	...	...	...	...
0.092	1 095	2 191	...	...	...	...
0.093	1 072	2 144	...	...	...	...
0.094	1 049	2 099	...	...	...	...
0.095	1 027	2 055	...	...	...	...
0.096	1 006	2 012	...	...	...	...
0.097	985	1 971	...	...	...	...
0.098	965	1 931	...	...	...	...
0.099	946	1 892	...	...	...	...
0.100	927	1 855	...	...	...	...

Table D.3 HV5 – HV100 (d : 0.056 mm to 1.999 mm)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.101	909	1 818	...	...	...	...
0.102	891	1 782	...	...	...	...
0.103	874	1 748	...	...	...	...
0.104	857	1 715	...	...	...	...
0.105	841	1 682	...	...	...	...
0.106	825	1 651	...	...	...	...
0.107	810	1 620	...	...	...	...
0.108	795	1 590	...	...	...	...
0.109	780	1 561	...	...	...	...
0.110	766	1 533	...	...	...	...
0.111	753	1 505	...	...	...	...
0.112	739	1 478	2 956	...	...	...
0.113	726	1 452	2 904	...	...	...
0.114	713	1 427	2 853	...	...	...
0.115	701	1 402	2 804	...	...	...
0.116	689	1 378	2 756	...	...	...
0.117	677	1 355	2 709	...	...	...
0.118	666	1 332	2 663	...	...	...
0.119	655	1 310	2 619	...	...	...
0.120	644	1 288	2 575	...	...	...
0.121	633	1 267	2 533	...	...	...
0.122	623	1 246	2 491	...	...	...
0.123	613	1 226	2 451	...	...	...
0.124	603	1 206	2 412	...	...	...
0.125	593	1 187	2 373	...	...	...
0.126	584	1 168	2 336	...	...	...
0.127	575	1 150	2 299	...	...	...
0.128	566	1 132	2 263	...	...	...
0.129	557	1 114	2 228	...	...	...
0.130	549	1 097	2 194	...	...	...
0.131	540	1 081	2 161	...	...	...
0.132	532	1 064	2 128	...	...	...
0.133	524	1 048	2 096	...	...	...
0.134	516	1 033	2 065	...	...	...
0.135	509	1 018	2 035	...	...	...
0.136	501	1 003	2 005	...	...	...
0.137	494	988	1 976	2 964	...	...
0.138	487	974	1 947	2 921	...	...
0.139	480	960	1 919	2 879	...	...
0.140	473	946	1 892	2 838	...	...
0.141	466	933	1 865	2 789	...	...
0.142	460	920	1 839	2 759	...	...
0.143	453	907	1 813	2 721	...	...
0.144	447	894	1 788	2 683	...	...
0.145	441	882	1 764	2 646	...	...

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.146	435	870	1 740	2 610	...	...
0.147	429	858	1 716	2 575	...	...
0.148	423	847	1 693	2 540	...	...
0.149	418	835	1 670	2 506	...	...
0.150	412	824	1 648	2 473	...	...
0.151	407	813	1 626	2 440	...	...
0.152	401	803	1 605	2 408	...	...
0.153	396	792	1 584	2 377	...	...
0.154	391	782	1 564	2 346	...	...
0.155	386	772	1 543	2 316	...	...
0.156	381	762	1 524	2 286	...	...
0.157	376	752	1 504	2 257	...	...
0.158	371	743	1 485	2 229	...	...
0.159	367	734	1 467	2 201	...	...
0.160	362	724	1 449	2 173	...	...
0.161	358	715	1 431	2 146	...	...
0.162	353	707	1 413	2 120	...	...
0.163	349	698	1 396	2 094	...	...
0.164	345	690	1 379	2 068	...	...
0.165	341	681	1 362	2 043	...	...
0.166	336	673	1 346	2 019	...	...
0.167	332	665	1 330	1 995	...	...
0.168	328	657	1 314	1 971	...	...
0.169	325	649	1 298	1 948	...	...
0.170	321	642	1 283	1 925	...	...
0.171	317	634	1 268	1 903	...	...
0.172	313	627	1 253	1 881	...	...
0.173	310	620	1 239	1 859	...	...
0.174	306	613	1 225	1 838	...	...
0.175	303	606	1 211	1 817	...	...
0.176	299	599	1 197	1 796	2 993	...
0.177	296	592	1 184	1 776	2 959	...
0.178	293	585	1 170	1 756	2 926	...
0.179	289	579	1 157	1 736	2 894	...
0.180	286	572	1 145	1 717	2 862	...
0.181	283	566	1 132	1 698	2 830	...
0.182	280	560	1 120	1 680	2 799	...
0.183	277	554	1 107	1 661	2 769	...
0.184	274	548	1 095	1 643	2 739	...
0.185	271	542	1 083	1 626	2 709	...
0.186	268	536	1 072	1 608	2 680	...
0.187	265	530	1 060	1 591	2 651	...
0.188	262	525	1 049	1 574	2 623	...
0.189	260	519	1 038	1 557	2 596	...
0.190	257	514	1 027	1 541	2 568	...

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.191	254	508	1 016	1 525	2 541	...
0.192	252	503	1 006	1 509	2 515	...
0.193	249	498	996	1 494	2 489	...
0.194	246	493	985	1 478	2 463	...
0.195	244	488	975	1 463	2 438	...
0.196	241	483	965	1 448	2 413	...
0.197	239	478	956	1 434	2 389	...
0.198	236	473	946	1 419	2 365	...
0.199	234	468	936	1 405	2 341	...
0.200	232	464	927	1 391	2 318	...
0.201	229	459	918	1 377	2 295	...
0.202	227	454	909	1 363	2 272	...
0.203	225	450	900	1 350	2 250	...
0.204	223	446	891	1 337	2 228	...
0.205	221	441	882	1 324	2 206	...
0.206	218	437	874	1 311	2 185	...
0.207	216	433	865	1 298	2 164	...
0.208	214	429	857	1 286	2 143	...
0.209	212	425	849	1 274	2 123	...
0.210	210	421	841	1 262	2 102	...
0.211	208	417	833	1 250	2 083	...
0.212	206	413	825	1 238	2 063	...
0.213	204	409	817	1 226	2 044	...
0.214	202	405	810	1 215	2 025	...
0.215	201	401	802	1 204	2 006	...
0.216	199	397	795	1 192	1 987	...
0.217	197	394	787	1 181	1 969	...
0.218	195	390	780	1 171	1 951	...
0.219	193	387	773	1 160	1 933	...
0.220	192	383	766	1 149	1 916	...
0.221	190	380	759	1 139	1 898	...
0.222	188	376	752	1 129	1 881	...
0.223	186	373	746	1 119	1 864	...
0.224	185	370	739	1 109	1 848	...
0.225	183	366	732	1 099	1 831	...
0.226	182	363	726	1 089	1 815	...
0.227	180	360	720	1 080	1 799	...
0.228	178	357	713	1 070	1 784	...
0.229	177	354	707	1 061	1 768	...
0.230	175	351	701	1 052	1 753	...
0.231	174	348	695	1 043	1 738	...
0.232	172	345	689	1 034	1 723	...
0.233	171	342	683	1 025	1 708	...
0.234	169	339	677	1 016	1 693	...
0.235	168	336	671	1 007	1 679	...

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.236	166	333	666	999	1 665	...
0.237	165	330	660	990	1 651	...
0.238	164	327	655	982	1 637	...
0.239	162	325	649	974	1 623	...
0.240	161	322	644	966	1 610	...
0.241	160	319	638	958	1 596	...
0.242	158	317	633	950	1 583	...
0.243	157	314	628	942	1 570	...
0.244	156	311	623	934	1 557	...
0.245	154	309	618	927	1 545	...
0.246	153	306	613	919	1 532	...
0.247	152	304	608	912	1 520	...
0.248	151	302	603	905	1 507	...
0.249	150	299	598	897	1 495	...
0.250	148	297	593	890	1 483	...
0.251	147	294	589	883	1 472	...
0.252	146	292	584	876	1 460	...
0.253	145	290	579	869	1 448	...
0.254	144	287	575	862	1 437	...
0.255	143	285	570	856	1 426	...
0.256	141	283	566	849	1 415	2 830
0.257	140	281	561	842	1 404	2 808
0.258	139	279	557	836	1 393	2 786
0.259	138	276	553	829	1 382	2 765
0.260	137	274	549	823	1 372	2 743
0.261	136	272	544	817	1 361	2 722
0.262	135	270	540	810	1 351	2 702
0.263	134	268	536	804	1 340	2 681
0.264	133	266	532	798	1 330	2 661
0.265	132	264	528	792	1 320	2 641
0.266	131	262	524	786	1 310	2 621
0.267	130	260	520	780	1 301	2 601
0.268	129	258	516	775	1 291	2 582
0.269	128	256	512	769	1 281	2 563
0.270	127	254	509	763	1 272	2 544
0.271	126	253	505	758	1 262	2 525
0.272	125	251	501	752	1 253	2 507
0.273	124	249	498	746	1 244	2 488
0.274	123	247	494	741	1 235	2 470
0.275	123	245	490	736	1 226	2 452
0.276	122	243	487	730	1 217	2 434
0.277	121	242	483	725	1 208	2 417
0.278	120	240	480	720	1 200	2 400
0.279	119	238	476	715	1 191	2 382
0.280	118	237	473	710	1 183	2 365

Table D.3 (continued) 112

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.281	117	235	470	705	1 174	2 349
0.282	117	233	466	700	1 166	2 332
0.283	116	232	463	695	1 158	2 316
0.284	115	230	460	690	1 150	2 299
0.285	114	228	457	685	1 141	2 283
0.286	113	227	453	680	1 133	2 267
0.287	113	225	450	675	1 126	2 251
0.288	112	224	447	671	1 118	2 236
0.289	111	222	444	666	1 110	2 220
0.290	110	221	441	662	1 102	2 205
0.291	109	219	438	657	1 095	2 190
0.292	109	218	435	652	1 087	2 175
0.293	108	216	432	648	1 080	2 160
0.294	107	215	429	644	1 073	2 146
0.295	107	213	426	639	1 065	2 131
0.296	106	212	423	635	1 058	2 117
0.297	105	210	420	631	1 051	2 102
0.298	104	209	418	626	1 044	2 088
0.299	104	207	415	622	1 037	2 074
0.300	103	206	412	618	1 030	2 061
0.301	102	205	409	614	1 023	2 047
0.302	102	203	407	610	1 017	2 033
0.303	101	202	404	606	1 010	2 020
0.304	100	201	401	602	1 003	2 007
0.305	99.7	199	399	598	997	1 994
0.306	99.0	198	396	594	990	1 981
0.307	98.4	197	393	590	984	1 968
0.308	97.7	195	391	586	977	1 955
0.309	97.1	194	388	583	971	1 942
0.310	96.5	193	386	579	965	1 930
0.311	95.9	192	383	575	959	1 917
0.312	95.2	191	381	572	952	1 905
0.313	94.6	189	379	568	946	1 893
0.314	94.0	188	376	564	940	1 881
0.315	93.4	187	374	561	934	1 869
0.316	92.8	186	371	557	928	1 857
0.317	92.3	185	369	554	923	1 845
0.318	91.7	183	367	550	917	1 834
0.319	91.1	182	364	547	911	1 822
0.320	90.5	181	362	543	905	1 811
0.321	90.0	180	360	540	900	1 800
0.322	89.4	179	358	537	894	1 789
0.323	88.9	178	355	533	889	1 778
0.324	88.3	177	353	530	883	1 767
0.325	87.8	176	351	527	878	1 756

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.326	87.2	174	349	523	872	1 745
0.327	86.7	173	347	520	867	1 734
0.328	86.2	172	345	517	862	1 724
0.329	85.7	171	343	514	857	1 713
0.330	85.1	170	341	511	851	1 703
0.331	84.6	169	338	508	846	1 693
0.332	84.1	168	336	505	841	1 682
0.333	83.6	167	334	502	836	1 672
0.334	83.1	166	332	499	831	1 662
0.335	82.6	165	330	496	826	1 652
0.336	82.1	164	328	493	821	1 643
0.337	81.6	163	327	490	816	1 633
0.338	81.2	162	325	487	812	1 623
0.339	80.7	161	323	484	807	1 614
0.340	80.2	160	321	481	802	1 604
0.341	79.7	159	319	478	797	1 595
0.342	79.3	159	317	476	793	1 586
0.343	78.8	158	315	473	788	1 576
0.344	78.3	157	313	470	783	1 567
0.345	77.9	156	312	467	779	1 558
0.346	77.4	155	310	465	774	1 549
0.347	77.0	154	308	462	770	1 540
0.348	76.6	153	306	459	766	1 531
0.349	76.1	152	304	457	761	1 523
0.350	75.7	151	303	454	757	1 514
0.351	75.3	151	301	452	753	1 505
0.352	74.8	150	299	449	748	1 497
0.353	74.4	149	298	446	744	1 488
0.354	74.0	148	296	444	740	1 480
0.355	73.6	147	294	441	736	1 472
0.356	73.2	146	293	439	732	1 463
0.357	72.7	146	291	437	727	1 455
0.358	72.3	145	289	434	723	1 447
0.359	71.9	144	288	432	719	1 439
0.360	71.5	143	286	429	715	1 431
0.361	71.1	142	285	427	711	1 423
0.362	70.8	142	283	425	708	1 415
0.363	70.4	141	281	422	704	1 407
0.364	70.0	140	280	420	700	1 400
0.365	69.6	139	278	418	696	1 392
0.366	69.2	138	277	415	692	1 384
0.367	68.8	138	275	413	688	1 377
0.368	68.5	137	274	411	685	1 369
0.369	68.1	136	272	409	681	1 362
0.370	67.7	135	271	406	677	1 355

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.371	67.4	135	269	404	674	1 347
0.372	67.0	134	268	402	670	1 340
0.373	66.6	133	267	400	666	1 333
0.374	66.3	133	265	398	663	1 326
0.375	65.9	132	264	396	659	1 319
0.376	65.6	131	262	394	656	1 312
0.377	65.2	130	261	391	652	1 305
0.378	64.9	130	260	389	649	1 298
0.379	64.5	129	258	387	645	1 291
0.380	64.2	128	257	385	642	1 284
0.381	63.9	128	255	383	639	1 278
0.382	63.5	127	254	381	635	1 271
0.383	63.2	126	253	379	632	1 264
0.384	62.9	126	251	377	629	1 258
0.385	62.6	125	250	375	626	1 251
0.386	62.2	124	249	373	622	1 245
0.387	61.9	124	248	371	619	1 238
0.388	61.6	123	246	370	616	1 232
0.389	61.3	123	245	368	613	1 226
0.390	61.0	122	244	366	610	1 219
0.391	60.6	121	243	364	606	1 213
0.392	60.3	121	241	362	603	1 207
0.393	60.0	120	240	360	600	1 201
0.394	59.7	119	239	358	597	1 195
0.395	59.4	119	238	357	594	1 189
0.396	59.1	118	236	355	591	1 183
0.397	58.8	118	235	353	588	1 177
0.398	58.5	117	234	351	585	1 171
0.399	58.2	116	233	349	582	1 165
0.400	57.9	116	232	348	579	1 159
0.401	57.7	115	231	346	577	1 153
0.402	57.4	115	229	344	574	1 148
0.403	57.1	114	228	343	571	1 142
0.404	56.8	114	227	341	568	1 136
0.405	56.5	113	226	339	565	1 131
0.406	56.2	113	225	338	562	1 125
0.407	56.0	112	224	336	560	1 120
0.408	55.7	111	223	334	557	1 114
0.409	55.4	111	222	333	554	1 109
0.410	55.2	110	221	331	552	1 103
0.411	54.9	110	220	329	549	1 098
0.412	54.6	109	218	328	546	1 093
0.413	54.4	109	217	326	544	1 087
0.414	54.1	108	216	325	541	1 082
0.415	53.8	108	215	323	538	1 077

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.416	53.6	107	214	321	536	1 072
0.417	53.3	107	213	320	533	1 066
0.418	53.1	106	212	318	531	1 061
0.419	52.8	106	211	317	528	1 056
0.420	52.6	105	210	315	526	1 051
0.421	52.3	105	209	314	523	1 046
0.422	52.1	104	208	312	521	1 041
0.423	51.8	104	207	311	518	1 036
0.424	51.6	103	206	309	516	1 032
0.425	51.3	103	205	308	513	1 027
0.426	51.1	102	204	307	511	1 022
0.427	50.9	102	203	305	509	1 017
0.428	50.6	101	202	304	506	1 012
0.429	50.4	101	201	302	504	1 008
0.430	50.1	100	201	301	501	1 003
0.431	49.9	99.8	200	299	499	998
0.432	49.7	99.4	199	298	497	994
0.433	49.5	98.9	198	297	495	989
0.434	49.2	98.5	197	295	492	985
0.435	49.0	98.0	196	294	490	980
0.436	48.8	97.6	195	293	488	976
0.437	48.6	97.1	194	291	486	971
0.438	48.3	96.7	193	290	483	967
0.439	48.1	96.2	192	289	481	962
0.440	47.9	95.8	192	287	479	958
0.441	47.7	95.4	191	286	477	954
0.442	47.5	94.9	190	285	475	949
0.443	47.2	94.5	189	283	472	945
0.444	47.0	94.1	188	282	470	941
0.445	46.8	93.6	187	281	468	936
0.446	46.6	93.2	186	280	466	932
0.447	46.4	92.8	186	278	464	928
0.448	46.2	92.4	185	277	462	924
0.449	46.0	92.0	184	276	460	920
0.450	45.8	91.6	183	275	458	916
0.451	45.6	91.2	182	274	456	912
0.452	45.4	90.8	182	272	454	908
0.453	45.2	90.4	181	271	452	904
0.454	45.0	90.0	180	270	450	900
0.455	44.8	89.6	179	269	448	896
0.456	44.6	89.2	178	268	446	892
0.457	44.4	88.8	178	266	444	888
0.458	44.2	88.4	177	265	442	884
0.459	44.0	88.0	176	264	440	880
0.460	43.8	87.6	175	263	438	876

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.461	43.6	87.3	174	262	436	873
0.462	43.4	86.9	174	261	434	869
0.463	43.3	86.5	173	260	433	865
0.464	43.1	86.1	172	258	431	861
0.465	42.9	85.8	171	257	429	858
0.466	42.7	85.4	171	256	427	854
0.467	42.5	85.0	170	255	425	850
0.468	42.3	84.7	169	254	423	847
0.469	42.2	84.3	169	253	422	843
0.470	42.0	84.0	168	252	420	840
0.471	41.8	83.6	167	251	418	836
0.472	41.6	83.2	166	250	416	832
0.473	41.4	82.9	166	249	414	829
0.474	41.3	82.5	165	248	413	825
0.475	41.1	82.2	164	247	411	822
0.476	40.9	81.8	164	246	409	818
0.477	40.7	81.5	163	245	407	815
0.478	40.6	81.2	162	243	406	812
0.479	40.4	80.8	162	242	404	808
0.480	40.2	80.5	161	241	402	805
0.481	40.1	80.2	160	240	401	802
0.482	39.9	79.8	160	239	399	798
0.483	39.7	79.5	159	238	397	795
0.484	39.6	79.2	158	237	396	792
0.485	39.4	78.8	158	237	394	788
0.486	39.3	78.5	157	236	393	785
0.487	39.1	78.2	156	235	391	782
0.488	38.9	77.9	156	234	389	779
0.489	38.8	77.6	155	233	388	776
0.490	38.6	77.2	154	232	386	772
0.491	38.5	76.9	154	231	385	769
0.492	38.3	76.6	153	230	383	766
0.493	38.1	76.3	153	229	381	763
0.494	38.0	76.0	152	228	380	760
0.495	37.8	75.7	151	227	378	757
0.496	37.7	75.4	151	226	377	754
0.497	37.5	75.1	150	225	375	751
0.498	37.4	74.8	150	224	374	748
0.499	37.2	74.5	149	223	372	745
0.500	37.1	74.2	148	223	371	742
0.501	36.9	73.9	148	222	369	739
0.502	36.8	73.6	147	221	368	736
0.503	36.6	73.3	147	220	366	733
0.504	36.5	73.0	146	219	365	730
0.505	36.4	72.7	145	218	364	727

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.551	30.5	61.1	122	183	305	611
0.552	30.4	60.9	122	183	304	609
0.553	30.3	60.6	121	182	303	606
0.554	30.2	60.4	121	181	302	604
0.555	30.1	60.2	120	181	301	602
0.556	30.0	60.0	120	180	300	600
0.557	29.9	59.8	120	179	299	598
0.558	29.8	59.6	119	179	298	596
0.559	29.7	59.3	119	178	297	593
0.560	29.6	59.1	118	177	296	591
0.561	29.5	58.9	118	177	295	589
0.562	29.4	58.7	117	176	294	587
0.563	29.3	58.5	117	176	293	585
0.564	29.1	58.3	117	175	291	583
0.565	29.0	58.1	116	174	290	581
0.566	28.9	57.9	116	174	289	579
0.567	28.8	57.7	115	173	288	577
0.568	28.7	57.5	115	172	287	575
0.569	28.6	57.3	115	172	286	573
0.570	28.5	57.1	114	171	285	571
0.571	28.4	56.9	114	171	284	569
0.572	28.3	56.7	113	170	283	567
0.573	28.2	56.5	113	169	282	565
0.574	28.1	56.3	113	169	281	563
0.575	28.0	56.1	112	168	280	561
0.576	27.9	55.9	112	168	279	559
0.577	27.8	55.7	111	167	278	557
0.578	27.8	55.5	111	167	278	555
0.579	27.7	55.3	111	166	277	553
0.580	27.6	55.1	110	165	276	551
0.581	27.5	54.9	110	165	275	549
0.582	27.4	54.7	109	164	274	547
0.583	27.3	54.6	109	164	273	546
0.584	27.2	54.4	109	163	272	544
0.585	27.1	54.2	108	163	271	542
0.586	27.0	54.0	108	162	270	540
0.587	26.9	53.8	108	161	269	538
0.588	26.8	53.6	107	161	268	536
0.589	26.7	53.5	107	160	267	535
0.590	26.6	53.3	107	160	266	533
0.591	26.5	53.1	106	159	265	531
0.592	26.5	52.9	106	159	265	529
0.593	26.4	52.7	105	158	264	527
0.594	26.3	52.6	105	158	263	526
0.595	26.2	52.4	105	157	262	524

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.596	26.1	52.2	104	157	261	522
0.597	26.0	52.0	104	156	260	520
0.598	25.9	51.9	104	156	259	519
0.599	25.8	51.7	103	155	258	517
0.600	25.8	51.5	103	155	258	515
0.601	25.7	51.3	103	154	257	513
0.602	25.6	51.2	102	154	256	512
0.603	25.5	51.0	102	153	255	510
0.604	25.4	50.8	102	152	254	508
0.605	25.3	50.7	101	152	253	507
0.606	25.2	50.5	101	151	252	505
0.607	25.2	50.3	101	151	252	503
0.608	25.1	50.2	100	150	251	502
0.609	25.0	50.0	100	150	250	500
0.610	24.9	49.8	99.7	150	249	498
0.611	24.8	49.7	99.3	149	248	497
0.612	24.8	49.5	99.0	149	248	495
0.613	24.7	49.4	98.7	148	247	494
0.614	24.6	49.2	98.4	148	246	492
0.615	24.5	49.0	98.0	147	245	490
0.616	24.4	48.9	97.7	147	244	489
0.617	24.4	48.7	97.4	146	244	487
0.618	24.3	48.6	97.1	146	243	486
0.619	24.2	48.4	96.8	145	242	484
0.620	24.1	48.2	96.5	145	241	482
0.621	24.0	48.1	96.2	144	240	481
0.622	24.0	47.9	95.8	144	240	479
0.623	23.9	47.8	95.5	143	239	478
0.624	23.8	47.6	95.2	143	238	476
0.625	23.7	47.5	94.9	142	237	475
0.626	23.7	47.3	94.6	142	237	473
0.627	23.6	47.2	94.3	142	236	472
0.628	23.5	47.0	94.0	141	235	470
0.629	23.4	46.9	93.7	141	234	469
0.630	23.4	46.7	93.4	140	234	467
0.631	23.3	46.6	93.1	140	233	466
0.632	23.2	46.4	92.8	139	232	464
0.633	23.1	46.3	92.5	139	231	463
0.634	23.1	46.1	92.3	138	231	461
0.635	23.0	46.0	92.0	138	230	460
0.636	22.9	45.8	91.7	138	229	458
0.637	22.8	45.7	91.4	137	228	457
0.638	22.8	45.6	91.1	137	228	456
0.639	22.7	45.4	90.8	136	227	454
0.640	22.6	45.3	90.5	136	226	453

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.641	22.6	45.1	90.3	135	226	451
0.642	22.5	45.0	90.0	135	225	450
0.643	22.4	44.9	89.7	135	224	449
0.644	22.4	44.7	89.4	134	224	447
0.645	22.3	44.6	89.1	134	223	446
0.646	22.2	44.4	88.9	133	222	444
0.647	22.1	44.3	88.6	133	221	443
0.648	22.1	44.2	88.3	132	221	442
0.649	22.0	44.0	88.0	132	220	440
0.650	21.9	43.9	87.8	132	219	439
0.651	21.9	43.8	87.5	131	219	438
0.652	21.8	43.6	87.2	131	218	436
0.653	21.7	43.5	87.0	130	217	435
0.654	21.7	43.4	86.7	130	217	434
0.655	21.6	43.2	86.4	130	216	432
0.656	21.5	43.1	86.2	129	215	431
0.657	21.5	43.0	85.9	129	215	430
0.658	21.4	42.8	85.6	128	214	428
0.659	21.3	42.7	85.4	128	213	427
0.660	21.3	42.6	85.1	128	213	426
0.661	21.2	42.4	84.9	127	212	424
0.662	21.2	42.3	84.6	127	212	423
0.663	21.1	42.2	84.4	127	211	422
0.664	21.0	42.1	84.1	126	210	421
0.665	21.0	41.9	83.9	126	210	419
0.666	20.9	41.8	83.6	125	209	418
0.667	20.8	41.7	83.4	125	208	417
0.668	20.8	41.6	83.1	125	208	416
0.669	20.7	41.4	82.9	124	207	414
0.670	20.7	41.3	82.6	124	207	413
0.671	20.6	41.2	82.4	124	206	412
0.672	20.5	41.1	82.1	123	205	411
0.673	20.5	40.9	81.9	123	205	409
0.674	20.4	40.8	81.6	122	204	408
0.675	20.3	40.7	81.4	122	203	407
0.676	20.3	40.6	81.1	122	203	406
0.677	20.2	40.5	80.9	121	202	405
0.678	20.2	40.3	80.7	121	202	403
0.679	20.1	40.2	80.4	121	201	402
0.680	20.1	40.1	80.2	120	201	401
0.681	20.0	40.0	80.0	120	200	400
0.682	19.9	39.9	79.7	120	199	399
0.683	19.9	39.8	79.5	119	199	398
0.684	19.8	39.6	79.3	119	198	396
0.685	19.8	39.5	79.0	119	198	395

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.686	19.7	39.4	78.8	118	197	394
0.687	19.6	39.3	78.6	118	196	393
0.688	19.6	39.2	78.3	118	196	392
0.689	19.5	39.1	78.1	117	195	391
0.690	19.5	39.0	77.9	117	195	390
0.691	19.4	38.8	77.7	117	194	388
0.692	19.4	38.7	77.4	116	194	387
0.693	19.3	38.6	77.2	116	193	386
0.694	19.3	38.5	77.0	116	193	385
0.695	19.2	38.4	76.8	115	192	384
0.696	19.1	38.3	76.6	115	191	383
0.697	19.1	38.2	76.3	115	191	382
0.698	19.0	38.1	76.1	114	190	381
0.699	19.0	38.0	75.9	114	190	380
0.700	18.9	37.8	75.7	114	189	378
0.701	18.9	37.7	75.5	113	189	377
0.702	18.8	37.6	75.2	113	188	376
0.703	18.8	37.5	75.0	113	188	375
0.704	18.7	37.4	74.8	112	187	374
0.705	18.7	37.3	74.6	112	187	373
0.706	18.6	37.2	74.4	112	186	372
0.707	18.5	37.1	74.2	111	185	371
0.708	18.5	37.0	74.0	111	185	370
0.709	18.4	36.9	73.8	111	184	369
0.710	18.4	36.8	73.6	110	184	368
0.711	18.3	36.7	73.4	110	183	367
0.712	18.3	36.6	73.1	110	183	366
0.713	18.2	36.5	72.9	109	182	365
0.714	18.2	36.4	72.7	109	182	364
0.715	18.1	36.3	72.5	109	181	363
0.716	18.1	36.2	72.3	109	181	362
0.717	18.0	36.1	72.1	108	180	361
0.718	18.0	36.0	71.9	108	180	360
0.719	17.9	35.9	71.7	108	179	359
0.720	17.9	35.8	71.5	107	179	358
0.721	17.8	35.7	71.3	107	178	357
0.722	17.8	35.6	71.1	107	178	356
0.723	17.7	35.5	70.9	106	177	355
0.724	17.7	35.4	70.7	106	177	354
0.725	17.6	35.3	70.5	106	176	353
0.726	17.6	35.2	70.4	106	176	352
0.727	17.5	35.1	70.2	105	175	351
0.728	17.5	35.0	70.0	105	175	350
0.729	17.4	34.9	69.8	105	174	349
0.730	17.4	34.8	69.6	104	174	348

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.731	17.4	34.7	69.4	104	174	347
0.732	17.3	34.6	69.2	104	173	346
0.733	17.3	34.5	69.0	104	173	345
0.734	17.2	34.4	68.8	103	172	344
0.735	17.2	34.3	68.6	103	172	343
0.736	17.1	34.2	68.5	103	171	342
0.737	17.1	34.1	68.3	102	171	341
0.738	17.0	34.0	68.1	102	170	340
0.739	17.0	34.0	67.9	102	170	340
0.740	16.9	33.9	67.7	102	169	339
0.741	16.9	33.8	67.5	101	169	338
0.742	16.8	33.7	67.4	101	168	337
0.743	16.8	33.6	67.2	101	168	336
0.744	16.7	33.5	67.0	101	167	335
0.745	16.7	33.4	66.8	100	167	334
0.746	16.7	33.3	66.6	100	167	333
0.747	16.6	33.2	66.5	99.7	166	332
0.748	16.6	33.1	66.3	99.4	166	331
0.749	16.5	33.1	66.1	99.2	165	331
0.750	16.5	33.0	65.9	98.9	165	330
0.751	16.4	32.9	65.7	98.6	164	329
0.752	16.4	32.8	65.6	98.4	164	328
0.753	16.4	32.7	65.4	98.1	164	327
0.754	16.3	32.6	65.2	97.9	163	326
0.755	16.3	32.5	65.1	97.6	163	325
0.756	16.2	32.4	64.9	97.3	162	324
0.757	16.2	32.4	64.7	97.1	162	324
0.758	16.1	32.3	64.5	96.8	161	323
0.759	16.1	32.2	64.4	96.6	161	322
0.760	16.1	32.1	64.2	96.3	161	321
0.761	16.0	32.0	64.0	96.1	160	320
0.762	16.0	31.9	63.9	95.8	160	319
0.763	15.9	31.9	63.7	95.6	159	319
0.764	15.9	31.8	63.5	95.3	159	318
0.765	15.8	31.7	63.4	95.1	158	317
0.766	15.8	31.6	63.2	94.8	158	316
0.767	15.8	31.5	63.0	94.6	158	315
0.768	15.7	31.4	62.9	94.3	157	314
0.769	15.7	31.4	62.7	94.1	157	314
0.770	15.6	31.3	62.5	93.8	156	313
0.771	15.6	31.2	62.4	93.6	156	312
0.772	15.6	31.1	62.2	93.3	156	311
0.773	15.5	31.0	62.1	93.1	155	310
0.774	15.5	31.0	61.9	92.9	155	310
0.775	15.4	30.9	61.7	92.6	154	309

Table D.3 (continued)

Mean diagonal of indentation <i>d</i> mm	Test force <i>F</i> (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.776	15.4	30.8	61.6	92.4	154	308
0.777	15.4	30.7	61.4	92.1	154	307
0.778	15.3	30.6	61.3	91.9	153	306
0.779	15.3	30.6	61.1	91.7	153	306
0.780	15.2	30.5	61.0	91.4	152	305
0.781	15.2	30.4	60.8	91.2	152	304
0.782	15.2	30.3	60.6	91.0	152	303
0.783	15.1	30.2	60.5	90.7	151	302
0.784	15.1	30.2	60.3	90.5	151	302
0.785	15.0	30.1	60.2	90.3	150	301
0.786	15.0	30.0	60.0	90.1	150	300
0.787	15.0	29.9	59.9	89.8	150	299
0.788	14.9	29.9	59.7	89.6	149	299
0.789	14.9	29.8	59.6	89.4	149	298
0.790	14.9	29.7	59.4	89.1	149	297
0.791	14.8	29.6	59.3	88.9	148	296
0.792	14.8	29.6	59.1	88.7	148	296
0.793	14.7	29.5	59.0	88.5	147	295
0.794	14.7	29.4	58.8	88.2	147	294
0.795	14.7	29.3	58.7	88.0	147	293
0.796	14.6	29.3	58.5	87.8	146	293
0.797	14.6	29.2	58.4	87.6	146	292
0.798	14.6	29.1	58.2	87.4	146	291
0.799	14.5	29.0	58.1	87.1	145	290
0.800	14.5	29.0	57.9	86.9	145	290
0.801	14.5	28.9	57.8	86.7	145	289
0.802	14.4	28.8	57.7	86.5	144	288
0.803	14.4	28.8	57.5	86.3	144	288
0.804	14.3	28.7	57.4	86.1	143	287
0.805	14.3	28.6	57.2	85.9	143	286
0.806	14.3	28.5	57.1	85.6	143	285
0.807	14.2	28.5	56.9	85.4	142	285
0.808	14.2	28.4	56.8	85.2	142	284
0.809	14.2	28.3	56.7	85.0	142	283
0.810	14.1	28.3	56.5	84.8	141	283
0.811	14.1	28.2	56.4	84.6	141	282
0.812	14.1	28.1	56.2	84.4	141	281
0.813	14.0	28.1	56.1	84.2	140	281
0.814	14.0	28.0	56.0	84.0	140	280
0.815	14.0	27.9	55.8	83.8	140	279
0.816	13.9	27.9	55.7	83.6	139	279
0.817	13.9	27.8	55.6	83.3	139	278
0.818	13.9	27.7	55.4	83.1	139	277
0.819	13.8	27.6	55.3	82.9	138	276
0.820	13.8	27.6	55.1	82.7	138	276

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.821	13.8	27.5	55.0	82.5	138	275
0.822	13.7	27.4	54.9	82.3	137	274
0.823	13.7	27.4	54.7	82.1	137	274
0.824	13.7	27.3	54.6	81.9	137	273
0.825	13.6	27.2	54.5	81.7	136	272
0.826	13.6	27.2	54.4	81.5	136	272
0.827	13.6	27.1	54.2	81.3	136	271
0.828	13.5	27.0	54.1	81.1	135	270
0.829	13.5	27.0	54.0	81.0	135	270
0.830	13.5	26.9	53.8	80.8	135	269
0.831	13.4	26.9	53.7	80.6	134	269
0.832	13.4	26.8	53.6	80.4	134	268
0.833	13.4	26.7	53.4	80.2	134	267
0.834	13.3	26.7	53.3	80.0	133	267
0.835	13.3	26.6	53.2	79.8	133	266
0.836	13.3	26.5	53.1	79.6	133	265
0.837	13.2	26.5	52.9	79.4	132	265
0.838	13.2	26.4	52.8	79.2	132	264
0.839	13.2	26.3	52.7	79.0	132	263
0.840	13.1	26.3	52.6	78.8	131	263
0.841	13.1	26.2	52.4	78.7	131	262
0.842	13.1	26.2	52.3	78.5	131	262
0.843	13.0	26.1	52.2	78.3	130	261
0.844	13.0	26.0	52.1	78.1	130	260
0.845	13.0	26.0	51.9	77.9	130	260
0.846	13.0	25.9	51.8	77.7	130	259
0.847	12.9	25.9	51.7	77.5	129	259
0.848	12.9	25.8	51.6	77.4	129	258
0.849	12.9	25.7	51.4	77.2	129	257
0.850	12.8	25.7	51.3	77.0	128	257
0.851	12.8	25.6	51.2	76.8	128	256
0.852	12.8	25.5	51.1	76.6	128	255
0.853	12.7	25.5	51.0	76.5	127	255
0.854	12.7	25.4	50.8	76.3	127	254
0.855	12.7	25.4	50.7	76.1	127	254
0.856	12.7	25.3	50.6	75.9	127	253
0.857	12.6	25.3	50.5	75.7	126	253
0.858	12.6	25.2	50.4	75.6	126	252
0.859	12.6	25.1	50.3	75.4	126	251
0.860	12.5	25.1	50.1	75.2	125	251
0.861	12.5	25.0	50.0	75.0	125	250
0.862	12.5	25.0	49.9	74.9	125	250
0.863	12.4	24.9	49.8	74.7	124	249
0.864	12.4	24.8	49.7	74.5	124	248
0.865	12.4	24.8	49.6	74.4	124	248

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.866	12.4	24.7	49.4	74.2	124	247
0.867	12.3	24.7	49.3	74.0	123	246
0.868	12.3	24.6	49.2	73.8	123	246
0.869	12.3	24.6	49.1	73.7	123	246
0.870	12.2	24.5	49.0	73.5	122	245
0.871	12.2	24.4	48.9	73.3	122	244
0.872	12.2	24.4	48.8	73.2	122	244
0.873	12.2	24.3	48.7	73.0	122	243
0.874	12.1	24.3	48.5	72.8	121	243
0.875	12.1	24.2	48.4	72.7	121	242
0.876	12.1	24.2	48.3	72.5	121	242
0.877	12.1	24.1	48.2	72.3	121	241
0.878	12.0	24.1	48.1	72.2	120	241
0.879	12.0	24.0	48.0	72.0	120	240
0.880	12.0	23.9	47.9	71.8	120	239
0.881	11.9	23.9	47.8	71.7	119	239
0.882	11.9	23.8	47.7	71.5	119	238
0.883	11.9	23.8	47.6	71.4	119	238
0.884	11.9	23.7	47.5	71.2	119	237
0.885	11.8	23.7	47.3	71.0	118	237
0.886	11.8	23.6	47.2	70.9	118	236
0.887	11.8	23.6	47.1	70.7	118	236
0.888	11.8	23.5	47.0	70.6	118	235
0.889	11.7	23.5	46.9	70.4	117	235
0.890	11.7	23.4	46.8	70.2	117	234
0.891	11.7	23.4	46.7	70.1	117	234
0.892	11.7	23.3	46.6	69.9	117	233
0.893	11.6	23.3	46.5	69.8	116	233
0.894	11.6	23.2	46.4	69.6	116	232
0.895	11.6	23.2	46.3	69.5	116	232
0.896	11.5	23.1	46.2	69.3	115	231
0.897	11.5	23.0	46.1	69.1	115	230
0.898	11.5	23.0	46.0	69.0	115	230
0.899	11.5	22.9	45.9	68.8	115	229
0.900	11.4	22.9	45.8	68.7	114	229
0.901	11.4	22.8	45.7	68.5	114	228
0.902	11.4	22.8	45.6	68.4	114	228
0.903	11.4	22.7	45.5	68.2	114	227
0.904	11.3	22.7	45.4	68.1	113	227
0.905	11.3	22.6	45.3	67.9	113	226
0.906	11.3	22.6	45.2	67.8	113	226
0.907	11.3	22.5	45.1	67.6	113	225
0.908	11.2	22.5	45.0	67.5	112	225
0.909	11.2	22.4	44.9	67.3	112	224
0.910	11.2	22.4	44.8	67.2	112	224

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.911	11.2	22.3	44.7	67.0	112	223
0.912	11.1	22.3	44.6	66.9	111	223
0.913	11.1	22.2	44.5	66.7	111	222
0.914	11.1	22.2	44.4	66.6	111	222
0.915	11.1	22.2	44.3	66.4	111	222
0.916	11.1	22.1	44.2	66.3	111	221
0.917	11.0	22.1	44.1	66.2	110	221
0.918	11.0	22.0	44.0	66.0	110	220
0.919	11.0	22.0	43.9	65.9	110	220
0.920	11.0	21.9	43.8	65.7	110	219
0.921	10.9	21.9	43.7	65.6	109	219
0.922	10.9	21.8	43.6	65.4	109	218
0.923	10.9	21.8	43.5	65.3	109	218
0.924	10.9	21.7	43.4	65.2	109	217
0.925	10.8	21.7	43.3	65.0	108	217
0.926	10.8	21.6	43.2	64.9	108	216
0.927	10.8	21.6	43.2	64.7	108	216
0.928	10.8	21.5	43.1	64.6	108	215
0.929	10.7	21.5	43.0	64.5	107	215
0.930	10.7	21.4	42.9	64.3	107	214
0.931	10.7	21.4	42.8	64.2	107	214
0.932	10.7	21.3	42.7	64.0	107	213
0.933	10.7	21.3	42.6	63.9	107	213
0.934	10.6	21.3	42.5	63.8	106	213
0.935	10.6	21.2	42.4	63.6	106	212
0.936	10.6	21.2	42.3	63.5	106	212
0.937	10.6	21.1	42.2	63.4	106	211
0.938	10.5	21.1	42.1	63.2	105	211
0.939	10.5	21.0	42.1	63.1	105	210
0.940	10.5	21.0	42.0	63.0	105	210
0.941	10.5	20.9	41.9	62.8	105	209
0.942	10.4	20.9	41.8	62.7	104	209
0.943	10.4	20.9	41.7	62.6	104	209
0.944	10.4	20.8	41.6	62.4	104	208
0.945	10.4	20.8	41.5	62.3	104	208
0.946	10.4	20.7	41.4	62.2	104	207
0.947	10.3	20.7	41.3	62.0	103	207
0.948	10.3	20.6	41.3	61.9	103	206
0.949	10.3	20.6	41.2	61.8	103	206
0.950	10.3	20.5	41.1	61.6	103	205
0.951	10.3	20.5	41.0	61.5	103	205
0.952	10.2	20.5	40.9	61.4	102	205
0.953	10.2	20.4	40.8	61.3	102	204
0.954	10.2	20.4	40.7	61.1	102	204
0.955	10.2	20.3	40.7	61.0	102	203

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
0.956	10.1	20.3	40.6	60.9	101	203
0.957	10.1	20.2	40.5	60.7	101	202
0.958	10.1	20.2	40.4	60.6	101	202
0.959	10.1	20.2	40.3	60.5	101	202
0.960	10.1	20.1	40.2	60.4	101	201
0.961	10.0	20.1	40.2	60.2	100	201
0.962	10.0	20.0	40.1	60.1	100	200
0.963	10.0	20.0	40.0	60.0	100	200
0.964	9.98	20.0	39.9	59.9	99.8	200
0.965	9.96	19.9	39.8	59.7	99.6	199
0.966	9.94	19.9	39.7	59.6	99.4	199
0.967	9.92	19.8	39.7	59.5	99.2	198
0.968	9.89	19.8	39.6	59.4	98.9	198
0.969	9.87	19.8	39.5	59.2	98.7	198
0.970	9.85	19.7	39.4	59.1	98.5	197
0.971	9.83	19.7	39.3	59.0	98.3	197
0.972	9.81	19.6	39.2	58.9	98.1	196
0.973	9.79	19.6	39.2	58.8	97.9	196
0.974	9.77	19.5	39.1	58.6	97.7	195
0.975	9.75	19.5	39.0	58.5	97.5	195
0.976	9.73	19.5	38.9	58.4	97.3	195
0.977	9.71	19.4	38.8	58.3	97.1	194
0.978	9.69	19.4	38.8	58.2	96.9	194
0.979	9.67	19.3	38.7	58.0	96.7	193
0.980	9.65	19.3	38.6	57.9	96.5	193
0.981	9.63	19.3	38.5	57.8	96.3	193
0.982	9.61	19.2	38.5	57.7	96.1	192
0.983	9.60	19.2	38.4	57.6	96.0	192
0.984	9.58	19.2	38.3	57.5	95.8	192
0.985	9.56	19.1	38.2	57.3	95.6	191
0.986	9.54	19.1	38.1	57.2	95.4	191
0.987	9.52	19.0	38.1	57.1	95.2	190
0.988	9.50	19.0	38.0	57.0	95.0	190
0.989	9.48	19.0	37.9	56.9	94.8	190
0.990	9.46	18.9	37.8	56.8	94.6	189
0.991	9.44	18.9	37.8	56.6	94.4	189
0.992	9.42	18.8	37.7	56.5	94.2	188
0.993	9.40	18.8	37.6	56.4	94.0	188
0.994	9.38	18.8	37.5	56.3	93.8	188
0.995	9.36	18.7	37.5	56.2	93.6	187
0.996	9.35	18.7	37.4	56.1	93.5	187
0.997	9.33	18.7	37.3	56.0	93.3	187
0.998	9.31	18.6	37.2	55.9	93.1	186
0.999	9.29	18.6	37.2	55.7	92.9	186
1.000	9.27	18.5	37.1	55.6	92.7	185

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.001	9.25	18.5	37.0	55.5	92.5	185
1.002	9.23	18.5	36.9	55.4	92.3	185
1.003	9.22	18.4	36.9	55.3	92.2	184
1.004	9.20	18.4	36.8	55.2	92.0	184
1.005	9.18	18.4	36.7	55.1	91.8	184
1.006	9.16	18.3	36.6	55.0	91.6	183
1.007	9.14	18.3	36.6	54.9	91.4	183
1.008	9.12	18.3	36.5	54.8	91.2	183
1.009	9.11	18.2	36.4	54.6	91.1	182
1.010	9.09	18.2	36.4	54.5	90.9	182
1.011	9.07	18.1	36.3	54.4	90.7	181
1.012	9.05	18.1	36.2	54.3	90.5	181
1.013	9.04	18.1	36.1	54.2	90.4	181
1.014	9.02	18.0	36.1	54.1	90.2	180
1.015	9.00	18.0	36.0	54.0	90.0	180
1.016	8.98	18.0	35.9	53.9	89.8	180
1.017	8.96	17.9	35.9	53.8	89.6	179
1.018	8.95	17.9	35.8	53.7	89.5	179
1.019	8.93	17.9	35.7	53.6	89.3	179
1.020	8.91	17.8	35.6	53.5	89.1	178
1.021	8.89	17.8	35.6	53.4	88.9	178
1.022	8.88	17.8	35.5	53.3	88.8	178
1.023	8.86	17.7	35.4	53.2	88.6	177
1.024	8.84	17.7	35.4	53.1	88.4	177
1.025	8.82	17.7	35.3	53.0	88.2	177
1.026	8.81	17.6	35.2	52.8	88.1	176
1.027	8.79	17.6	35.2	52.7	87.9	176
1.028	8.77	17.5	35.1	52.6	87.7	175
1.029	8.76	17.5	35.0	52.5	87.6	175
1.030	8.74	17.5	35.0	52.4	87.4	175
1.031	8.72	17.4	34.9	52.3	87.2	174
1.032	8.71	17.4	34.8	52.2	87.1	174
1.033	8.69	17.4	34.8	52.1	86.9	174
1.034	8.67	17.3	34.7	52.0	86.7	173
1.035	8.66	17.3	34.6	51.9	86.6	173
1.036	8.64	17.3	34.6	51.8	86.4	173
1.037	8.62	17.2	34.5	51.7	86.2	172
1.038	8.61	17.2	34.4	51.6	86.1	172
1.039	8.59	17.2	34.4	51.5	85.9	172
1.040	8.57	17.1	34.3	51.4	85.7	171
1.041	8.56	17.1	34.2	51.3	85.6	171
1.042	8.54	17.1	34.2	51.2	85.4	171
1.043	8.52	17.0	34.1	51.1	85.2	170
1.044	8.51	17.0	34.0	51.0	85.1	170
1.045	8.49	17.0	34.0	50.9	84.9	170

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.046	8.47	16.9	33.9	50.8	84.7	169
1.047	8.46	16.9	33.8	50.8	84.6	169
1.048	8.44	16.9	33.8	50.7	84.4	169
1.049	8.43	16.9	33.7	50.6	84.3	169
1.050	8.41	16.8	33.6	50.5	84.1	168
1.051	8.39	16.8	33.6	50.4	83.9	168
1.052	8.38	16.8	33.5	50.3	83.8	168
1.053	8.36	16.7	33.4	50.2	83.6	167
1.054	8.35	16.7	33.4	50.1	83.5	167
1.055	8.33	16.7	33.3	50.0	83.3	167
1.056	8.31	16.6	33.3	49.9	83.1	166
1.057	8.30	16.6	33.2	49.8	83.0	166
1.058	8.28	16.6	33.1	49.7	82.8	166
1.059	8.27	16.5	33.1	49.6	82.7	165
1.060	8.25	16.5	33.0	49.5	82.5	165
1.061	8.24	16.5	32.9	49.4	82.4	165
1.062	8.22	16.4	32.9	49.3	82.2	164
1.063	8.21	16.4	32.8	49.2	82.1	164
1.064	8.19	16.4	32.8	49.1	81.9	164
1.065	8.17	16.4	32.7	49.0	81.7	164
1.066	8.16	16.3	32.6	49.0	81.6	163
1.067	8.14	16.3	32.6	48.9	81.4	163
1.068	8.13	16.3	32.5	48.8	81.3	163
1.069	8.11	16.2	32.4	48.7	81.1	162
1.070	8.10	16.2	32.4	48.6	81.0	162
1.071	8.08	16.2	32.3	48.5	80.8	162
1.072	8.07	16.1	32.3	48.4	80.7	161
1.073	8.05	16.1	32.2	48.3	80.5	161
1.074	8.04	16.1	32.1	48.2	80.4	161
1.075	8.02	16.0	32.1	48.1	80.2	160
1.076	8.01	16.0	32.0	48.1	80.1	160
1.077	7.99	16.0	32.0	48.0	79.9	160
1.078	7.98	16.0	31.9	47.9	79.8	160
1.079	7.96	15.9	31.9	47.8	79.6	159
1.080	7.95	15.9	31.8	47.7	79.5	159
1.081	7.93	15.9	31.7	47.6	79.3	159
1.082	7.92	15.8	31.7	47.5	79.2	158
1.083	7.90	15.8	31.6	47.4	79.0	158
1.084	7.89	15.8	31.6	47.3	78.9	158
1.085	7.88	15.8	31.5	47.3	78.8	158
1.086	7.86	15.7	31.4	47.2	78.6	157
1.087	7.85	15.7	31.4	47.1	78.5	157
1.088	7.83	15.7	31.3	47.0	78.3	157
1.089	7.82	15.6	31.3	46.9	78.2	156
1.090	7.80	15.6	31.2	46.8	78.0	156

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.091	7.79	15.6	31.2	46.7	77.9	156
1.092	7.78	15.6	31.1	46.7	77.8	156
1.093	7.76	15.5	31.0	46.6	77.6	155
1.094	7.75	15.5	31.0	46.5	77.5	155
1.095	7.73	15.5	30.9	46.4	77.3	155
1.096	7.72	15.4	30.9	46.3	77.2	154
1.097	7.70	15.4	30.8	46.2	77.0	154
1.098	7.69	15.4	30.8	46.1	76.9	154
1.099	7.68	15.4	30.7	46.1	76.8	154
1.100	7.66	15.3	30.6	46.0	76.6	153
1.101	7.65	15.3	30.6	45.9	76.5	153
1.102	7.63	15.3	30.5	45.8	76.3	153
1.103	7.62	15.2	30.5	45.7	76.2	152
1.104	7.61	15.2	30.4	45.6	76.1	152
1.105	7.59	15.2	30.4	45.6	75.9	152
1.106	7.58	15.2	30.3	45.5	75.8	152
1.107	7.57	15.1	30.3	45.4	75.7	151
1.108	7.55	15.1	30.2	45.3	75.5	151
1.109	7.54	15.1	30.2	45.2	75.4	151
1.110	7.53	15.1	30.1	45.2	75.3	151
1.111	7.51	15.0	30.0	45.1	75.1	150
1.112	7.50	15.0	30.0	45.0	75.0	150
1.113	7.48	15.0	29.9	44.9	74.8	150
1.114	7.47	14.9	29.9	44.8	74.7	149
1.115	7.46	14.9	29.8	44.7	74.6	149
1.116	7.44	14.9	29.8	44.7	74.4	149
1.117	7.43	14.9	29.7	44.6	74.3	149
1.118	7.42	14.8	29.7	44.5	74.2	148
1.119	7.40	14.8	29.6	44.4	74.0	148
1.120	7.39	14.8	29.6	44.4	73.9	148
1.121	7.38	14.8	29.5	44.3	73.8	148
1.122	7.36	14.7	29.5	44.2	73.6	147
1.123	7.35	14.7	29.4	44.1	73.5	147
1.124	7.34	14.7	29.4	44.0	73.4	147
1.125	7.33	14.7	29.3	44.0	73.3	147
1.126	7.31	14.6	29.2	43.9	73.1	146
1.127	7.30	14.6	29.2	43.8	73.0	146
1.128	7.29	14.6	29.1	43.7	72.9	146
1.129	7.27	14.5	29.1	43.6	72.7	145
1.130	7.26	14.5	29.0	43.6	72.6	145
1.131	7.25	14.5	29.0	43.5	72.5	145
1.132	7.24	14.5	28.9	43.4	72.4	145
1.133	7.22	14.4	28.9	43.3	72.2	144
1.134	7.21	14.4	28.8	43.3	72.1	144
1.135	7.20	14.4	28.8	43.2	72.0	144

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.136	7.18	14.4	28.7	43.1	71.8	144
1.137	7.17	14.3	28.7	43.0	71.7	143
1.138	7.16	14.3	28.6	43.0	71.6	143
1.139	7.15	14.3	28.6	42.9	71.5	143
1.140	7.13	14.3	28.5	42.8	71.3	143
1.141	7.12	14.2	28.5	42.7	71.2	142
1.142	7.11	14.2	28.4	42.7	71.1	142
1.143	7.10	14.2	28.4	42.6	71.0	142
1.144	7.08	14.2	28.3	42.5	70.8	142
1.145	7.07	14.1	28.3	42.4	70.7	141
1.146	7.06	14.1	28.2	42.4	70.6	141
1.147	7.05	14.1	28.2	42.3	70.5	141
1.148	7.04	14.1	28.1	42.2	70.4	141
1.149	7.02	14.0	28.1	42.1	70.2	140
1.150	7.01	14.0	28.0	42.1	70.1	140
1.151	7.00	14.0	28.0	42.0	70.0	140
1.152	6.99	14.0	27.9	41.9	69.9	140
1.153	6.97	13.9	27.9	41.8	69.7	139
1.154	6.96	13.9	27.8	41.8	69.6	139
1.155	6.95	13.9	27.8	41.7	69.5	139
1.154	6.94	13.9	27.7	41.6	69.4	139
1.157	6.93	13.9	27.7	41.6	69.3	139
1.158	6.91	13.8	27.7	41.5	69.1	138
1.159	6.90	13.8	27.6	41.4	69.0	138
1.160	6.89	13.8	27.6	41.3	68.9	138
1.161	6.88	13.8	27.5	41.3	68.8	138
1.162	6.87	13.7	27.5	41.2	68.7	137
1.163	6.85	13.7	27.4	41.1	68.5	137
1.164	6.84	13.7	27.4	41.1	68.4	137
1.165	6.83	13.7	27.3	41.0	68.3	137
1.166	6.82	13.6	27.3	40.9	68.2	136
1.167	6.81	13.6	27.2	40.9	68.1	136
1.168	6.80	13.6	27.2	40.8	68.0	136
1.169	6.78	13.6	27.1	40.7	67.8	136
1.170	6.77	13.6	27.1	40.6	67.7	135
1.171	6.76	13.5	27.0	40.6	67.6	135
1.172	6.75	13.5	27.0	40.5	67.5	135
1.173	6.74	13.5	27.0	40.4	67.4	135
1.174	6.73	13.5	26.9	40.4	67.3	135
1.175	6.72	13.4	26.9	40.3	67.2	134
1.176	6.70	13.4	26.8	40.2	67.0	134
1.177	6.69	13.4	26.8	40.2	66.9	134
1.178	6.68	13.4	26.7	40.1	66.8	134
1.179	6.67	13.3	26.7	40.0	66.7	133
1.180	6.66	13.3	26.6	40.0	66.6	133

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.181	6.65	13.3	26.6	39.9	66.5	133
1.182	6.64	13.3	26.5	39.8	66.4	133
1.183	6.62	13.3	26.5	39.8	66.2	133
1.184	6.61	13.2	26.5	39.7	66.1	132
1.185	6.60	13.2	26.4	39.6	66.0	132
1.186	6.59	13.2	26.4	39.6	65.9	132
1.187	6.58	13.2	26.3	39.5	65.8	132
1.188	6.57	13.1	26.3	39.4	65.7	131
1.189	6.56	13.1	26.2	39.4	65.6	131
1.190	6.55	13.1	26.2	39.3	65.5	131
1.191	6.54	13.1	26.1	39.2	65.4	131
1.192	6.53	13.1	26.1	39.2	65.3	131
1.193	6.51	13.0	26.1	39.1	65.1	130
1.194	6.50	13.0	26.0	39.0	65.0	130
1.195	6.49	13.0	26.0	39.0	64.9	130
1.196	6.48	13.0	25.9	38.9	64.8	130
1.197	6.47	12.9	25.9	38.8	64.7	129
1.198	6.46	12.9	25.8	38.8	64.6	129
1.199	6.45	12.9	25.8	38.7	64.5	129
1.200	6.44	12.9	25.8	38.6	64.4	129
1.201	6.43	12.9	25.7	38.6	64.3	129
1.202	6.42	12.8	25.7	38.5	64.2	128
1.203	6.41	12.8	25.6	38.4	64.1	128
1.204	6.40	12.8	25.6	38.4	64.0	128
1.205	6.39	12.8	25.5	38.3	63.9	128
1.206	6.37	12.8	25.5	38.3	63.7	128
1.207	6.36	12.7	25.5	38.2	63.6	127
1.208	6.35	12.7	25.4	38.1	63.5	127
1.209	6.34	12.7	25.4	38.1	63.4	127
1.210	6.33	12.7	25.3	38.0	63.3	127
1.211	6.32	12.6	25.3	37.9	63.2	126
1.212	6.31	12.6	25.2	37.9	63.1	126
1.213	6.30	12.6	25.2	37.8	63.0	126
1.214	6.29	12.6	25.2	37.7	62.9	126
1.215	6.28	12.6	25.1	37.7	62.8	126
1.216	6.27	12.5	25.1	37.6	62.7	125
1.217	6.26	12.5	25.0	37.6	62.6	125
1.218	6.25	12.5	25.0	37.5	62.5	125
1.219	6.24	12.5	25.0	37.4	62.4	125
1.220	6.23	12.5	24.9	37.4	62.3	125
1.221	6.22	12.4	24.9	37.3	62.2	124
1.222	6.21	12.4	24.8	37.3	62.1	124
1.223	6.20	12.4	24.8	37.2	62.0	124
1.224	6.19	12.4	24.8	37.1	61.9	124
1.225	6.18	12.4	24.7	37.1	61.8	124

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.226	6.17	12.3	24.7	37.0	61.7	123
1.227	6.16	12.3	24.6	37.0	61.6	123
1.228	6.15	12.3	24.6	36.9	61.5	123
1.229	6.14	12.3	24.6	36.8	61.4	123
1.230	6.13	12.3	24.5	36.8	61.3	123
1.231	6.12	12.2	24.5	36.7	61.2	122
1.232	6.11	12.2	24.4	36.7	61.1	122
1.233	6.10	12.2	24.4	36.6	61.0	122
1.234	6.09	12.2	24.4	36.5	60.9	122
1.235	6.08	12.2	24.3	36.5	60.8	122
1.236	6.07	12.1	24.3	36.4	60.7	121
1.237	6.06	12.1	24.2	36.4	60.6	121
1.238	6.05	12.1	24.2	36.3	60.5	121
1.239	6.04	12.1	24.2	36.2	60.4	121
1.240	6.03	12.1	24.1	36.2	60.3	121
1.241	6.02	12.0	24.1	36.1	60.2	120
1.242	6.01	12.0	24.0	36.1	60.1	120
1.243	6.00	12.0	24.0	36.0	60.0	120
1.244	5.99	12.0	24.0	35.9	59.9	120
1.245	5.98	12.0	23.9	35.9	59.8	120
1.246	5.97	11.9	23.9	35.8	59.7	119
1.247	5.96	11.9	23.8	35.8	59.6	119
1.248	5.95	11.9	23.8	35.7	59.5	119
1.249	5.94	11.9	23.8	35.7	59.4	119
1.250	5.93	11.9	23.7	35.6	59.3	119
1.251	5.92	11.8	23.7	35.5	59.2	118
1.252	5.91	11.8	23.7	35.5	59.1	118
1.253	5.91	11.8	23.6	35.4	59.1	118
1.254	5.90	11.8	23.6	35.4	59.0	118
1.255	5.89	11.8	23.5	35.3	58.9	118
1.256	5.88	11.8	23.5	35.3	58.8	118
1.257	5.87	11.7	23.5	35.2	58.7	117
1.258	5.86	11.7	23.4	35.2	58.6	117
1.259	5.85	11.7	23.4	35.1	58.5	117
1.260	5.84	11.7	23.4	35.0	58.4	117
1.261	5.83	11.7	23.3	35.0	58.3	117
1.262	5.82	11.6	23.3	34.9	58.2	116
1.263	5.81	11.6	23.2	34.9	58.1	116
1.264	5.80	11.6	23.2	34.8	58.0	116
1.265	5.79	11.6	23.2	34.8	57.9	116
1.266	5.78	11.6	23.1	34.7	57.8	116
1.267	5.78	11.6	23.1	34.7	57.8	116
1.268	5.77	11.5	23.1	34.6	57.7	115
1.269	5.76	11.5	23.0	34.5	57.6	115
1.270	5.75	11.5	23.0	34.5	57.5	115

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.271	5.74	11.5	23.0	34.4	57.4	115
1.272	5.73	11.5	22.9	34.4	57.3	115
1.273	5.72	11.4	22.9	34.3	57.2	114
1.274	5.71	11.4	22.8	34.3	57.1	114
1.275	5.70	11.4	22.8	34.2	57.0	114
1.276	5.69	11.4	22.8	34.2	56.9	114
1.277	5.69	11.4	22.7	34.1	56.9	114
1.278	5.68	11.4	22.7	34.1	56.8	114
1.279	5.67	11.3	22.7	34.0	56.7	113
1.280	5.66	11.3	22.6	34.0	56.6	113
1.281	5.65	11.3	22.6	33.9	56.5	113
1.282	5.64	11.3	22.6	33.8	56.4	113
1.283	5.63	11.3	22.5	33.8	56.3	113
1.284	5.62	11.2	22.5	33.7	56.2	112
1.285	5.61	11.2	22.5	33.7	56.1	112
1.286	5.61	11.2	22.4	33.6	56.1	112
1.287	5.60	11.2	22.4	33.6	56.0	112
1.288	5.59	11.2	22.4	33.5	55.9	112
1.289	5.58	11.2	22.3	33.5	55.8	112
1.290	5.57	11.1	22.3	33.4	55.7	111
1.291	5.56	11.1	22.2	33.4	55.6	111
1.292	5.55	11.1	22.2	33.3	55.5	111
1.293	5.55	11.1	22.2	33.3	55.5	111
1.294	5.54	11.1	22.1	33.2	55.4	111
1.295	5.53	11.1	22.1	33.2	55.3	111
1.296	5.52	11.0	22.1	33.1	55.2	110
1.297	5.51	11.0	22.0	33.1	55.1	110
1.298	5.50	11.0	22.0	33.0	55.0	110
1.299	5.49	11.0	22.0	33.0	54.9	110
1.300	5.49	11.0	21.9	32.9	54.9	110
1.301	5.48	11.0	21.9	32.9	54.8	110
1.302	5.47	10.9	21.9	32.8	54.7	109
1.303	5.46	10.9	21.8	32.8	54.6	109
1.304	5.45	10.9	21.8	32.7	54.5	109
1.305	5.44	10.9	21.8	32.7	54.4	109
1.306	5.44	10.9	21.7	32.6	54.4	109
1.307	5.43	10.9	21.7	32.6	54.3	109
1.308	5.42	10.8	21.7	32.5	54.2	108
1.309	5.41	10.8	21.6	32.5	54.1	108
1.310	5.40	10.8	21.6	32.4	54.0	108
1.311	5.39	10.8	21.6	32.4	53.9	108
1.312	5.39	10.8	21.5	32.3	53.9	108
1.313	5.38	10.8	21.5	32.3	53.8	108
1.314	5.37	10.7	21.5	32.2	53.7	107
1.315	5.36	10.7	21.4	32.2	53.6	107

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.316	5.35	10.7	21.4	32.1	53.5	107
1.317	5.35	10.7	21.4	32.1	53.5	107
1.318	5.34	10.7	21.3	32.0	53.4	107
1.319	5.33	10.7	21.3	32.0	53.3	107
1.320	5.32	10.6	21.3	31.9	53.2	106
1.321	5.31	10.6	21.3	31.9	53.1	106
1.322	5.31	10.6	21.2	31.8	53.1	106
1.323	5.30	10.6	21.2	31.8	53.0	106
1.324	5.29	10.6	21.2	31.7	52.9	106
1.325	5.28	10.6	21.1	31.7	52.8	106
1.326	5.27	10.5	21.1	31.6	52.7	105
1.327	5.27	10.5	21.1	31.6	52.7	105
1.328	5.26	10.5	21.0	31.5	52.6	105
1.329	5.25	10.5	21.0	31.5	52.5	105
1.330	5.24	10.5	21.0	31.5	52.4	105
1.331	5.23	10.5	20.9	31.4	52.3	105
1.332	5.23	10.5	20.9	31.4	52.3	105
1.333	5.22	10.4	20.9	31.3	52.2	104
1.334	5.21	10.4	20.8	31.3	52.1	104
1.335	5.20	10.4	20.8	31.2	52.0	104
1.336	5.19	10.4	20.8	31.2	51.9	104
1.337	5.19	10.4	20.7	31.1	51.9	104
1.338	5.18	10.4	20.7	31.1	51.8	104
1.339	5.17	10.3	20.7	31.0	51.7	103
1.340	5.16	10.3	20.7	31.0	51.6	103
1.341	5.16	10.3	20.6	30.9	51.6	103
1.342	5.15	10.3	20.6	30.9	51.5	103
1.343	5.14	10.3	20.6	30.8	51.4	103
1.344	5.13	10.3	20.5	30.8	51.3	103
1.345	5.13	10.3	20.5	30.8	51.3	103
1.346	5.12	10.2	20.5	30.7	51.2	102
1.347	5.11	10.2	20.4	30.7	51.1	102
1.348	5.10	10.2	20.4	30.6	51.0	102
1.349	5.09	10.2	20.4	30.6	50.9	102
1.350	5.09	10.2	20.3	30.5	50.9	102
1.351	5.08	10.2	20.3	30.5	50.8	102
1.352	5.07	10.1	20.3	30.4	50.7	101
1.353	5.06	10.1	20.3	30.4	50.6	101
1.354	5.06	10.1	20.2	30.3	50.6	101
1.355	5.05	10.1	20.2	30.3	50.5	101
1.356	5.04	10.1	20.2	30.3	50.4	101
1.357	5.03	10.1	20.1	30.2	50.3	101
1.358	5.03	10.1	20.1	30.2	50.3	101
1.359	5.02	10.0	20.1	30.1	50.2	100
1.360	5.01	10.0	20.0	30.1	50.1	100

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.361	5.01	10.0	20.0	30.0	50.1	100
1.362	5.00	10.0	20.0	30.0	50.0	100
1.363	4.99	9.98	20.0	29.9	49.9	99.8
1.364	4.98	9.97	19.9	29.9	49.8	99.7
1.365	4.98	9.95	19.9	29.9	49.8	99.5
1.366	4.97	9.94	19.9	29.8	49.7	99.4
1.367	4.96	9.92	19.8	29.8	49.6	99.2
1.368	4.95	9.91	19.8	29.7	49.5	99.1
1.369	4.95	9.90	19.8	29.7	49.5	99.0
1.370	...	9.88	19.8	29.6	49.4	98.8
1.371	...	9.87	19.7	29.6	49.3	98.7
1.372	...	9.85	19.7	29.6	49.3	98.5
1.373	...	9.84	19.7	29.5	49.2	98.4
1.374	...	9.82	19.6	29.5	49.1	98.2
1.375	...	9.81	19.6	29.4	49.0	98.1
1.376	...	9.79	19.6	29.4	49.0	97.9
1.377	...	9.78	19.6	29.3	48.9	97.8
1.378	...	9.77	19.5	29.3	48.8	97.7
1.379	...	9.75	19.5	29.3	48.8	97.5
1.380	...	9.74	19.5	29.2	48.7	97.4
1.381	...	9.72	19.4	29.2	48.6	97.2
1.382	...	9.71	19.4	29.1	48.5	97.1
1.383	...	9.70	19.4	29.1	48.5	97.0
1.384	...	9.68	19.4	29.0	48.4	96.8
1.385	...	9.67	19.3	29.0	48.3	96.7
1.386	...	9.65	19.3	29.0	48.3	96.5
1.387	...	9.64	19.3	28.9	48.2	96.4
1.388	...	9.63	19.2	28.9	48.1	96.3
1.389	...	9.61	19.2	28.8	48.1	96.1
1.390	...	9.60	19.2	28.8	48.0	96.0
1.391	...	9.58	19.2	28.8	47.9	95.8
1.392	...	9.57	19.1	28.7	47.8	95.7
1.393	...	9.56	19.1	28.7	47.8	95.6
1.394	...	9.54	19.1	28.6	47.7	95.4
1.395	...	9.53	19.1	28.6	47.6	95.3
1.396	...	9.52	19.0	28.5	47.6	95.2
1.397	...	9.50	19.0	28.5	47.5	95.0
1.398	...	9.49	19.0	28.5	47.4	94.9
1.399	...	9.48	18.9	28.4	47.4	94.8
1.400	...	9.46	18.9	28.4	47.3	94.6
1.401	...	9.45	18.9	28.3	47.2	94.5
1.402	...	9.43	18.9	28.3	47.2	94.3
1.403	...	9.42	18.8	28.3	47.1	94.2
1.404	...	9.41	18.8	28.2	47.0	94.1
1.405	...	9.39	18.8	28.2	47.0	93.9

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.406	...	9.38	18.8	28.1	46.9	93.8
1.407	...	9.37	18.7	28.1	46.8	93.7
1.408	...	9.35	18.7	28.1	46.8	93.5
1.409	...	9.34	18.7	28.0	46.7	93.4
1.410	...	9.33	18.7	28.0	46.6	93.3
1.411	...	9.31	18.6	27.9	46.6	93.1
1.412	...	9.30	18.6	27.9	46.5	93.0
1.413	...	9.29	18.6	27.9	46.4	92.9
1.414	...	9.28	18.5	27.8	46.4	92.8
1.415	...	9.26	18.5	27.8	46.3	92.6
1.416	...	9.25	18.5	27.7	46.2	92.5
1.417	...	9.24	18.5	27.7	46.2	92.4
1.418	...	9.22	18.4	27.7	46.1	92.2
1.419	...	9.21	18.4	27.6	46.0	92.1
1.420	...	9.20	18.4	27.6	46.0	92.0
1.421	...	9.18	18.4	27.6	45.9	91.8
1.422	...	9.17	18.3	27.5	45.9	91.7
1.423	...	9.16	18.3	27.5	45.8	91.6
1.424	...	9.15	18.3	27.4	45.7	91.5
1.425	...	9.13	18.3	27.4	45.7	91.3
1.426	...	9.12	18.2	27.4	45.6	91.2
1.427	...	9.11	18.2	27.3	45.5	91.1
1.428	...	9.09	18.2	27.3	45.5	90.9
1.429	...	9.08	18.2	27.2	45.4	90.8
1.430	...	9.07	18.1	27.2	45.3	90.7
1.431	...	9.06	18.1	27.2	45.3	90.6
1.432	...	9.04	18.1	27.1	45.2	90.4
1.433	...	9.03	18.1	27.1	45.2	90.3
1.434	...	9.02	18.0	27.1	45.1	90.2
1.435	...	9.01	18.0	27.0	45.0	90.1
1.436	...	8.99	18.0	27.0	45.0	89.9
1.437	...	8.98	18.0	26.9	44.9	89.8
1.438	...	8.97	17.9	26.9	44.8	89.7
1.439	...	8.96	17.9	26.9	44.8	89.6
1.440	...	8.94	17.9	26.8	44.7	89.4
1.441	...	8.93	17.9	26.8	44.7	89.3
1.442	...	8.92	17.8	26.8	44.6	89.2
1.443	...	8.91	17.8	26.7	44.5	89.1
1.444	...	8.89	17.8	26.7	44.5	88.9
1.445	...	8.88	17.8	26.6	44.4	88.8
1.446	...	8.87	17.7	26.6	44.3	88.7
1.447	...	8.86	17.7	26.6	44.3	88.6
1.448	...	8.84	17.7	26.5	44.2	88.4
1.449	...	8.83	17.7	26.5	44.2	88.3
1.450	...	8.82	17.6	26.5	44.1	88.2

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.451	...	8.81	17.6	26.4	44.0	88.1
1.452	...	8.80	17.6	26.4	44.0	88.0
1.453	...	8.78	17.6	26.4	43.9	87.8
1.454	...	8.77	17.5	26.3	43.9	87.7
1.455	...	8.76	17.5	26.3	43.8	87.6
1.456	...	8.75	17.5	26.2	43.7	87.5
1.457	...	8.74	17.5	26.2	43.7	87.4
1.458	...	8.72	17.4	26.2	43.6	87.2
1.459	...	8.71	17.4	26.1	43.6	87.1
1.460	...	8.70	17.4	26.1	43.5	87.0
1.461	...	8.69	17.4	26.1	43.4	86.9
1.462	...	8.68	17.3	26.0	43.4	86.8
1.463	...	8.66	17.3	26.0	43.3	86.6
1.464	...	8.65	17.3	26.0	43.3	86.5
1.465	...	8.64	17.3	25.9	43.2	86.4
1.466	...	8.63	17.3	25.9	43.1	86.3
1.467	...	8.62	17.2	25.9	43.1	86.2
1.468	...	8.61	17.2	25.8	43.0	86.1
1.469	...	8.59	17.2	25.8	43.0	85.9
1.470	...	8.58	17.2	25.7	42.9	85.8
1.471	...	8.57	17.1	25.7	42.8	85.7
1.472	...	8.56	17.1	25.7	42.8	85.6
1.473	...	8.55	17.1	25.6	42.7	85.5
1.474	...	8.54	17.1	25.6	42.7	85.4
1.475	...	8.52	17.0	25.6	42.6	85.2
1.476	...	8.51	17.0	25.5	42.6	85.1
1.477	...	8.50	17.0	25.5	42.5	85.0
1.478	...	8.49	17.0	25.5	42.4	84.9
1.479	...	8.48	17.0	25.4	42.4	84.8
1.480	...	8.47	16.9	25.4	42.3	84.7
1.481	...	8.46	16.9	25.4	42.3	84.6
1.482	...	8.44	16.9	25.3	42.2	84.4
1.483	...	8.43	16.9	25.3	42.2	84.3
1.484	...	8.42	16.8	25.3	42.1	84.2
1.485	...	8.41	16.8	25.2	42.0	84.1
1.486	...	8.40	16.8	25.2	42.0	84.0
1.487	...	8.39	16.8	25.2	41.9	83.9
1.488	...	8.38	16.7	25.1	41.9	83.8
1.489	...	8.36	16.7	25.1	41.8	83.6
1.490	...	8.35	16.7	25.1	41.8	83.5
1.491	...	8.34	16.7	25.0	41.7	83.4
1.492	...	8.33	16.7	25.0	41.7	83.3
1.493	...	8.32	16.6	25.0	41.6	83.2
1.494	...	8.31	16.6	24.9	41.5	83.1
1.495	...	8.30	16.6	24.9	41.5	83.0

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.496	...	8.29	16.6	24.9	41.4	82.9
1.497	...	8.28	16.5	24.8	41.4	82.8
1.498	...	8.26	16.5	24.8	41.3	82.6
1.499	...	8.25	16.5	24.8	41.3	82.5
1.500	...	8.24	16.5	24.7	41.2	82.4
1.501	...	8.23	16.5	24.7	41.2	82.3
1.502	...	8.22	16.4	24.7	41.1	82.2
1.503	...	8.21	16.4	24.6	41.0	82.1
1.504	...	8.20	16.4	24.6	41.0	82.0
1.505	...	8.19	16.4	24.6	40.9	81.9
1.506	...	8.18	16.4	24.5	40.9	81.8
1.507	...	8.17	16.3	24.5	40.8	81.7
1.508	...	8.16	16.3	24.5	40.8	81.6
1.509	...	8.14	16.3	24.4	40.7	81.4
1.510	...	8.13	16.3	24.4	40.7	81.3
1.511	...	8.12	16.2	24.4	40.6	81.2
1.512	...	8.11	16.2	24.3	40.6	81.1
1.513	...	8.10	16.2	24.3	40.5	81.0
1.514	...	8.09	16.2	24.3	40.4	80.9
1.515	...	8.08	16.2	24.2	40.4	80.8
1.516	...	8.07	16.1	24.2	40.3	80.7
1.517	...	8.06	16.1	24.2	40.3	80.6
1.518	...	8.05	16.1	24.1	40.2	80.5
1.519	...	8.04	16.1	24.1	40.2	80.4
1.520	...	8.03	16.1	24.1	40.1	80.3
1.521	...	8.02	16.0	24.0	40.1	80.2
1.522	...	8.01	16.0	24.0	40.0	80.1
1.523	...	8.00	16.0	24.0	40.0	80.0
1.524	...	7.98	16.0	24.0	39.9	79.8
1.525	...	7.97	15.9	23.9	39.9	79.7
1.526	...	7.96	15.9	23.9	39.8	79.6
1.527	...	7.95	15.9	23.9	39.8	79.5
1.528	...	7.94	15.9	23.8	39.7	79.4
1.529	...	7.93	15.9	23.8	39.7	79.3
1.530	...	7.92	15.8	23.8	39.6	79.2
1.531	...	7.91	15.8	23.7	39.6	79.1
1.532	...	7.90	15.8	23.7	39.5	79.0
1.533	...	7.89	15.8	23.7	39.5	78.9
1.534	...	7.88	15.8	23.6	39.4	78.8
1.535	...	7.87	15.7	23.6	39.3	78.7
1.536	...	7.86	15.7	23.6	39.3	78.6
1.537	...	7.85	15.7	23.5	39.2	78.5
1.538	...	7.84	15.7	23.5	39.2	78.4
1.539	...	7.83	15.7	23.5	39.1	78.3
1.540	...	7.82	15.6	23.5	39.1	78.2

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.541	...	7.81	15.6	23.4	39.0	78.1
1.542	...	7.80	15.6	23.4	39.0	78.0
1.543	...	7.79	15.6	23.4	38.9	77.9
1.544	...	7.78	15.6	23.3	38.9	77.8
1.545	...	7.77	15.5	23.3	38.8	77.7
1.546	...	7.76	15.5	23.3	38.8	77.6
1.547	...	7.75	15.5	23.2	38.7	77.5
1.548	...	7.74	15.5	23.2	38.7	77.4
1.549	...	7.73	15.5	23.2	38.6	77.3
1.550	...	7.72	15.4	23.2	38.6	77.2
1.551	...	7.71	15.4	23.1	38.5	77.1
1.552	...	7.70	15.4	23.1	38.5	77.0
1.553	...	7.69	15.4	23.1	38.4	76.9
1.554	...	7.68	15.4	23.0	38.4	76.8
1.555	...	7.67	15.3	23.0	38.3	76.7
1.556	...	7.66	15.3	23.0	38.3	76.6
1.557	...	7.65	15.3	22.9	38.2	76.5
1.558	...	7.64	15.3	22.9	38.2	76.4
1.559	...	7.63	15.3	22.9	38.1	76.3
1.560	...	7.62	15.2	22.9	38.1	76.2
1.561	...	7.61	15.2	22.8	38.0	76.1
1.562	...	7.60	15.2	22.8	38.0	76.0
1.563	...	7.59	15.2	22.8	38.0	75.9
1.564	...	7.58	15.2	22.7	37.9	75.8
1.565	...	7.57	15.1	22.7	37.9	75.7
1.566	...	7.56	15.1	22.7	37.8	75.6
1.567	...	7.55	15.1	22.7	37.8	75.5
1.568	...	7.54	15.1	22.6	37.7	75.4
1.569	...	7.53	15.1	22.6	37.7	75.3
1.570	...	7.52	15.0	22.6	37.6	75.2
1.571	...	7.51	15.0	22.5	37.6	75.1
1.572	...	7.50	15.0	22.5	37.5	75.0
1.573	...	7.49	15.0	22.5	37.5	74.9
1.574	...	7.49	15.0	22.5	37.4	74.9
1.575	...	7.48	14.9	22.4	37.4	74.8
1.576	...	7.47	14.9	22.4	37.3	74.7
1.577	...	7.46	14.9	22.4	37.3	74.6
1.578	...	7.45	14.9	22.3	37.2	74.5
1.579	...	7.44	14.9	22.3	37.2	74.4
1.580	...	7.43	14.9	22.3	37.1	74.3
1.581	...	7.42	14.8	22.3	37.1	74.2
1.582	...	7.41	14.8	22.2	37.0	74.1
1.583	...	7.40	14.8	22.2	37.0	74.0
1.584	...	7.39	14.8	22.2	37.0	73.9
1.585	...	7.38	14.8	22.1	36.9	73.8

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.586	...	7.37	14.7	22.1	36.9	73.7
1.587	...	7.36	14.7	22.1	36.8	73.6
1.588	...	7.35	14.7	22.1	36.8	73.5
1.589	...	7.34	14.7	22.0	36.7	73.4
1.590	...	7.34	14.7	22.0	36.7	73.4
1.591	...	7.33	14.6	22.0	36.6	73.3
1.592	...	7.32	14.6	22.0	36.6	73.2
1.593	...	7.31	14.6	21.9	36.5	73.1
1.594	...	7.30	14.6	21.9	36.5	73.0
1.595	...	7.29	14.6	21.9	36.4	72.9
1.596	...	7.28	14.6	21.8	36.4	72.8
1.597	...	7.27	14.5	21.8	36.4	72.7
1.598	...	7.26	14.5	21.8	36.3	72.6
1.599	...	7.25	14.5	21.8	36.3	72.5
1.600	...	7.24	14.5	21.7	36.2	72.4
1.601	...	7.24	14.5	21.7	36.2	72.4
1.602	...	7.23	14.4	21.7	36.1	72.3
1.603	...	7.22	14.4	21.7	36.1	72.2
1.604	...	7.21	14.4	21.6	36.0	72.1
1.605	...	7.20	14.4	21.6	36.0	72.0
1.606	...	7.19	14.4	21.6	35.9	71.9
1.607	...	7.18	14.4	21.5	35.9	71.8
1.608	...	7.17	14.3	21.5	35.9	71.7
1.609	...	7.16	14.3	21.5	35.8	71.6
1.610	...	7.15	14.3	21.5	35.8	71.5
1.611	...	7.15	14.3	21.4	35.7	71.5
1.612	...	7.14	14.3	21.4	35.7	71.4
1.613	...	7.13	14.3	21.4	35.6	71.3
1.614	...	7.12	14.2	21.4	35.6	71.2
1.615	...	7.11	14.2	21.3	35.5	71.1
1.616	...	7.10	14.2	21.3	35.5	71.0
1.617	...	7.09	14.2	21.3	35.5	70.9
1.618	...	7.08	14.2	21.3	35.4	70.8
1.619	...	7.08	14.1	21.2	35.4	70.8
1.620	...	7.07	14.1	21.2	35.3	70.7
1.621	...	7.06	14.1	21.2	35.3	70.6
1.622	...	7.05	14.1	21.1	35.2	70.5
1.623	...	7.04	14.1	21.1	35.2	70.4
1.624	...	7.03	14.1	21.1	35.2	70.3
1.625	...	7.02	14.0	21.1	35.1	70.2
1.626	...	7.01	14.0	21.0	35.1	70.1
1.627	...	7.01	14.0	21.0	35.0	70.1
1.628	...	7.00	14.0	21.0	35.0	70.0
1.629	...	6.99	14.0	21.0	34.9	69.9
1.630	...	6.98	14.0	20.9	34.9	69.8

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.631	...	6.97	13.9	20.9	34.9	69.7
1.632	...	6.96	13.9	20.9	34.8	69.6
1.633	...	6.95	13.9	20.9	34.8	69.5
1.634	...	6.95	13.9	20.8	34.7	69.5
1.635	...	6.94	13.9	20.8	34.7	69.4
1.636	...	6.93	13.9	20.8	34.6	69.3
1.637	...	6.92	13.8	20.8	34.6	69.2
1.638	...	6.91	13.8	20.7	34.6	69.1
1.639	...	6.90	13.8	20.7	34.5	69.0
1.640	...	6.90	13.8	20.7	34.5	69.0
1.641	...	6.89	13.8	20.7	34.4	68.9
1.642	...	6.88	13.8	20.6	34.4	68.8
1.643	...	6.87	13.7	20.6	34.3	68.7
1.644	...	6.86	13.7	20.6	34.3	68.6
1.645	...	6.85	13.7	20.6	34.3	68.5
1.646	...	6.84	13.7	20.5	34.2	68.4
1.647	...	6.84	13.7	20.5	34.2	68.4
1.648	...	6.83	13.7	20.5	34.1	68.3
1.649	...	6.82	13.6	20.5	34.1	68.2
1.650	...	6.81	13.6	20.4	34.1	68.1
1.651	...	6.80	13.6	20.4	34.0	68.0
1.652	...	6.80	13.6	20.4	34.0	68.0
1.653	...	6.79	13.6	20.4	33.9	67.9
1.654	...	6.78	13.6	20.3	33.9	67.8
1.655	...	6.77	13.5	20.3	33.8	67.7
1.656	...	6.76	13.5	20.3	33.8	67.6
1.657	...	6.75	13.5	20.3	33.8	67.5
1.658	...	6.75	13.5	20.2	33.7	67.5
1.659	...	6.74	13.5	20.2	33.7	67.4
1.660	...	6.73	13.5	20.2	33.6	67.3
1.661	...	6.72	13.4	20.2	33.6	67.2
1.662	...	6.71	13.4	20.1	33.6	67.1
1.663	...	6.71	13.4	20.1	33.5	67.1
1.664	...	6.70	13.4	20.1	33.5	67.0
1.665	...	6.69	13.4	20.1	33.4	66.9
1.666	...	6.68	13.4	20.0	33.4	66.8
1.667	...	6.67	13.3	20.0	33.4	66.7
1.668	...	6.67	13.3	20.0	33.3	66.7
1.669	...	6.66	13.3	20.0	33.3	66.6
1.670	...	6.65	13.3	19.9	33.2	66.5
1.671	...	6.64	13.3	19.9	33.2	66.4
1.672	...	6.63	13.3	19.9	33.2	66.3
1.673	...	6.63	13.2	19.9	33.1	66.3
1.674	...	6.62	13.2	19.9	33.1	66.2
1.675	...	6.61	13.2	19.8	33.0	66.1

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.676	...	6.60	13.2	19.8	33.0	66.0
1.677	...	6.59	13.2	19.8	33.0	65.9
1.678	...	6.59	13.2	19.8	32.9	65.9
1.679	...	6.58	13.2	19.7	32.9	65.8
1.680	...	6.57	13.1	19.7	32.8	65.7
1.681	...	6.56	13.1	19.7	32.8	65.6
1.682	...	6.56	13.1	19.7	32.8	65.6
1.683	...	6.55	13.1	19.6	32.7	65.5
1.684	...	6.54	13.1	19.6	32.7	65.4
1.685	...	6.53	13.1	19.6	32.7	65.3
1.686	...	6.52	13.0	19.6	32.6	65.2
1.687	...	6.52	13.0	19.5	32.6	65.2
1.688	...	6.51	13.0	19.5	32.5	65.1
1.689	...	6.50	13.0	19.5	32.5	65.0
1.690	...	6.49	13.0	19.5	32.5	64.9
1.691	...	6.49	13.0	19.5	32.4	64.9
1.692	...	6.48	13.0	19.4	32.4	64.8
1.693	...	6.47	12.9	19.4	32.3	64.7
1.694	...	6.46	12.9	19.4	32.3	64.6
1.695	...	6.45	12.9	19.4	32.3	64.5
1.696	...	6.45	12.9	19.3	32.2	64.5
1.697	...	6.44	12.9	19.3	32.2	64.4
1.698	...	6.43	12.9	19.3	32.2	64.3
1.699	...	6.42	12.8	19.3	32.1	64.2
1.700	...	6.42	12.8	19.3	32.1	64.2
1.701	...	6.41	12.8	19.2	32.0	64.1
1.702	...	6.40	12.8	19.2	32.0	64.0
1.703	...	6.39	12.8	19.2	32.0	63.9
1.704	...	6.39	12.8	19.2	31.9	63.9
1.705	...	6.38	12.8	19.1	31.9	63.8
1.706	...	6.37	12.7	19.1	31.9	63.7
1.707	...	6.36	12.7	19.1	31.8	63.6
1.708	...	6.36	12.7	19.1	31.8	63.6
1.709	...	6.35	12.7	19.0	31.7	63.5
1.710	...	6.34	12.7	19.0	31.7	63.4
1.711	...	6.33	12.7	19.0	31.7	63.3
1.712	...	6.33	12.7	19.0	31.6	63.3
1.713	...	6.32	12.6	19.0	31.6	63.2
1.714	...	6.31	12.6	18.9	31.6	63.1
1.715	...	6.31	12.6	18.9	31.5	63.1
1.716	...	6.30	12.6	18.9	31.5	63.0
1.717	...	6.29	12.6	18.9	31.4	62.9
1.718	...	6.28	12.6	18.8	31.4	62.8
1.719	...	6.28	12.5	18.8	31.4	62.8
1.720	...	6.27	12.5	18.8	31.3	62.7

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.721	...	6.26	12.5	18.8	31.3	62.6
1.722	...	6.25	12.5	18.8	31.3	62.5
1.723	...	6.25	12.5	18.7	31.2	62.5
1.724	...	6.24	12.5	18.7	31.2	62.4
1.725	...	6.23	12.5	18.7	31.2	62.3
1.726	...	6.23	12.4	18.7	31.1	62.3
1.727	...	6.22	12.4	18.7	31.1	62.2
1.728	...	6.21	12.4	18.6	31.1	62.1
1.729	...	6.20	12.4	18.6	31.0	62.0
1.730	...	6.20	12.4	18.6	31.0	62.0
1.731	...	6.19	12.4	18.6	30.9	61.9
1.732	...	6.18	12.4	18.5	30.9	61.8
1.733	...	6.17	12.3	18.5	30.9	61.7
1.734	...	6.17	12.3	18.5	30.8	61.7
1.735	...	6.16	12.3	18.5	30.8	61.6
1.736	...	6.15	12.3	18.5	30.8	61.5
1.737	...	6.15	12.3	18.4	30.7	61.5
1.738	...	6.14	12.3	18.4	30.7	61.4
1.739	...	6.13	12.3	18.4	30.7	61.3
1.740	...	6.13	12.2	18.4	30.6	61.3
1.741	...	6.12	12.2	18.4	30.6	61.2
1.742	...	6.11	12.2	18.3	30.6	61.1
1.743	...	6.10	12.2	18.3	30.5	61.0
1.744	...	6.10	12.2	18.3	30.5	61.0
1.745	...	6.09	12.2	18.3	30.4	60.9
1.746	...	6.08	12.2	18.2	30.4	60.8
1.747	...	6.08	12.2	18.2	30.4	60.8
1.748	...	6.07	12.1	18.2	30.3	60.7
1.749	...	6.06	12.1	18.2	30.3	60.6
1.750	...	6.06	12.1	18.2	30.3	60.6
1.751	...	6.05	12.1	18.1	30.2	60.5
1.752	...	6.04	12.1	18.1	30.2	60.4
1.753	...	6.03	12.1	18.1	30.2	60.3
1.754	...	6.03	12.1	18.1	30.1	60.3
1.755	...	6.02	12.0	18.1	30.1	60.2
1.756	...	6.01	12.0	18.0	30.1	60.1
1.757	...	6.01	12.0	18.0	30.0	60.1
1.758	...	6.00	12.0	18.0	30.0	60.0
1.759	...	5.99	12.0	18.0	30.0	59.9
1.760	...	5.99	12.0	18.0	29.9	59.9
1.761	...	5.98	12.0	17.9	29.9	59.8
1.762	...	5.97	11.9	17.9	29.9	59.7
1.763	...	5.97	11.9	17.9	29.8	59.7
1.764	...	5.96	11.9	17.9	29.8	59.6
1.765	...	5.95	11.9	17.9	29.8	59.5

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.766	...	5.95	11.9	17.8	29.7	59.5
1.767	...	5.94	11.9	17.8	29.7	59.4
1.768	...	5.93	11.9	17.8	29.7	59.3
1.769	...	5.93	11.8	17.8	29.6	59.3
1.770	...	5.92	11.8	17.8	29.6	59.2
1.771	...	5.91	11.8	17.7	29.6	59.1
1.772	...	5.91	11.8	17.7	29.5	59.1
1.773	...	5.90	11.8	17.7	29.5	59.0
1.774	...	5.89	11.8	17.7	29.5	58.9
1.775	...	5.89	11.8	17.7	29.4	58.9
1.776	...	5.88	11.8	17.6	29.4	58.8
1.777	...	5.87	11.7	17.6	29.4	58.7
1.778	...	5.87	11.7	17.6	29.3	58.7
1.779	...	5.86	11.7	17.6	29.3	58.6
1.780	...	5.85	11.7	17.6	29.3	58.5
1.781	...	5.85	11.7	17.5	29.2	58.5
1.782	...	5.84	11.7	17.5	29.2	58.4
1.783	...	5.83	11.7	17.5	29.2	58.3
1.784	...	5.83	11.7	17.5	29.1	58.3
1.785	...	5.82	11.6	17.5	29.1	58.2
1.786	...	5.81	11.6	17.4	29.1	58.1
1.787	...	5.81	11.6	17.4	29.0	58.1
1.788	...	5.80	11.6	17.4	29.0	58.0
1.789	...	5.79	11.6	17.4	29.0	57.9
1.790	...	5.79	11.6	17.4	28.9	57.9
1.791	...	5.78	11.6	17.3	28.9	57.8
1.792	...	5.77	11.5	17.3	28.9	57.7
1.793	...	5.77	11.5	17.3	28.8	57.7
1.794	...	5.76	11.5	17.3	28.8	57.6
1.795	...	5.76	11.5	17.3	28.8	57.6
1.796	...	5.75	11.5	17.2	28.7	57.5
1.797	...	5.74	11.5	17.2	28.7	57.4
1.798	...	5.74	11.5	17.2	28.7	57.4
1.799	...	5.73	11.5	17.2	28.6	57.3
1.800	...	5.72	11.4	17.2	28.6	57.2
1.801	...	5.72	11.4	17.2	28.6	57.2
1.802	...	5.71	11.4	17.1	28.6	57.1
1.803	...	5.70	11.4	17.1	28.5	57.0
1.804	...	5.70	11.4	17.1	28.5	57.0
1.805	...	5.69	11.4	17.1	28.5	56.9
1.806	...	5.69	11.4	17.1	28.4	56.9
1.807	...	5.68	11.4	17.0	28.4	56.8
1.808	...	5.67	11.3	17.0	28.4	56.7
1.809	...	5.67	11.3	17.0	28.3	56.7
1.810	...	5.66	11.3	17.0	28.3	56.6

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.811	...	5.65	11.3	17.0	28.3	56.5
1.812	...	5.65	11.3	16.9	28.2	56.5
1.813	...	5.64	11.3	16.9	28.2	56.4
1.814	...	5.64	11.3	16.9	28.2	56.4
1.815	...	5.63	11.3	16.9	28.1	56.3
1.816	...	5.62	11.2	16.9	28.1	56.2
1.817	...	5.62	11.2	16.9	28.1	56.2
1.818	...	5.61	11.2	16.8	28.1	56.1
1.819	...	5.60	11.2	16.8	28.0	56.0
1.820	...	5.60	11.2	16.8	28.0	56.0
1.821	...	5.59	11.2	16.8	28.0	55.9
1.822	...	5.59	11.2	16.8	27.9	55.9
1.823	...	5.58	11.2	16.7	27.9	55.8
1.824	...	5.57	11.1	16.7	27.9	55.7
1.825	...	5.57	11.1	16.7	27.8	55.7
1.826	...	5.56	11.1	16.7	27.8	55.6
1.827	...	5.56	11.1	16.7	27.8	55.6
1.828	...	5.55	11.1	16.6	27.7	55.5
1.829	...	5.54	11.1	16.6	27.7	55.4
1.830	...	5.54	11.1	16.6	27.7	55.4
1.831	...	5.53	11.1	16.6	27.7	55.3
1.832	...	5.53	11.0	16.6	27.6	55.3
1.833	...	5.52	11.0	16.6	27.6	55.2
1.834	...	5.51	11.0	16.5	27.6	55.1
1.835	...	5.51	11.0	16.5	27.5	55.1
1.836	...	5.50	11.0	16.5	27.5	55.0
1.837	...	5.50	11.0	16.5	27.5	55.0
1.838	...	5.49	11.0	16.5	27.4	54.9
1.839	...	5.48	11.0	16.5	27.4	54.8
1.840	...	5.48	11.0	16.4	27.4	54.8
1.841	...	5.47	10.9	16.4	27.4	54.7
1.842	...	5.47	10.9	16.4	27.3	54.7
1.843	...	5.46	10.9	16.4	27.3	54.6
1.844	...	5.45	10.9	16.4	27.3	54.5
1.845	...	5.45	10.9	16.3	27.2	54.5
1.846	...	5.44	10.9	16.3	27.2	54.4
1.847	...	5.44	10.9	16.3	27.2	54.4
1.848	...	5.43	10.9	16.3	27.1	54.3
1.849	...	5.42	10.8	16.3	27.1	54.2
1.850	...	5.42	10.8	16.3	27.1	54.2
1.851	...	5.41	10.8	16.2	27.1	54.1
1.852	...	5.41	10.8	16.2	27.0	54.1
1.853	...	5.40	10.8	16.2	27.0	54.0
1.854	...	5.40	10.8	16.2	27.0	54.0
1.855	...	5.39	10.8	16.2	26.9	53.9

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.856	...	5.38	10.8	16.2	26.9	53.8
1.857	...	5.38	10.8	16.1	26.9	53.8
1.858	...	5.37	10.7	16.1	26.9	53.7
1.859	...	5.37	10.7	16.1	26.8	53.7
1.860	...	5.36	10.7	16.1	26.8	53.6
1.861	...	5.35	10.7	16.1	26.8	53.5
1.862	...	5.35	10.7	16.0	26.7	53.5
1.863	...	5.34	10.7	16.0	26.7	53.4
1.864	...	5.34	10.7	16.0	26.7	53.4
1.865	...	5.33	10.7	16.0	26.7	53.3
1.866	...	5.33	10.6	16.0	26.6	53.3
1.867	...	5.32	10.6	16.0	26.6	53.2
1.868	...	5.31	10.6	15.9	26.6	53.1
1.869	...	5.31	10.6	15.9	26.5	53.1
1.870	...	5.30	10.6	15.9	26.5	53.0
1.871	...	5.30	10.6	15.9	26.5	53.0
1.872	...	5.29	10.6	15.9	26.5	52.9
1.873	...	5.29	10.6	15.9	26.4	52.9
1.874	...	5.28	10.6	15.8	26.4	52.8
1.875	...	5.28	10.5	15.8	26.4	52.8
1.876	...	5.27	10.5	15.8	26.3	52.7
1.877	...	5.26	10.5	15.8	26.3	52.6
1.878	...	5.26	10.5	15.8	26.3	52.6
1.879	...	5.25	10.5	15.8	26.3	52.5
1.880	...	5.25	10.5	15.7	26.2	52.5
1.881	...	5.24	10.5	15.7	26.2	52.4
1.882	...	5.24	10.5	15.7	26.2	52.4
1.883	...	5.23	10.5	15.7	26.1	52.3
1.884	...	5.22	10.4	15.7	26.1	52.2
1.885	...	5.22	10.4	15.7	26.1	52.2
1.886	...	5.21	10.4	15.6	26.1	52.1
1.887	...	5.21	10.4	15.6	26.0	52.1
1.888	...	5.20	10.4	15.6	26.0	52.0
1.889	...	5.20	10.4	15.6	26.0	52.0
1.890	...	5.19	10.4	15.6	26.0	51.9
1.891	...	5.19	10.4	15.6	25.9	51.9
1.892	...	5.18	10.4	15.5	25.9	51.8
1.893	...	5.18	10.3	15.5	25.9	51.8
1.894	...	5.17	10.3	15.5	25.8	51.7
1.895	...	5.16	10.3	15.5	25.8	51.6
1.896	...	5.16	10.3	15.5	25.8	51.6
1.897	...	5.15	10.3	15.5	25.8	51.5
1.898	...	5.15	10.3	15.4	25.7	51.5
1.899	...	5.14	10.3	15.4	25.7	51.4
1.900	...	5.14	10.3	15.4	25.7	51.4

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.901	...	5.13	10.3	15.4	25.7	51.3
1.902	...	5.13	10.3	15.4	25.6	51.3
1.903	...	5.12	10.2	15.4	25.6	51.2
1.904	...	5.12	10.2	15.3	25.6	51.2
1.905	...	5.11	10.2	15.3	25.5	51.1
1.906	...	5.10	10.2	15.3	25.5	51.0
1.907	...	5.10	10.2	15.3	25.5	51.0
1.908	...	5.09	10.2	15.3	25.5	50.9
1.909	...	5.09	10.2	15.3	25.4	50.9
1.910	...	5.08	10.2	15.2	25.4	50.8
1.911	...	5.08	10.2	15.2	25.4	50.8
1.912	...	5.07	10.1	15.2	25.4	50.7
1.913	...	5.07	10.1	15.2	25.3	50.7
1.914	...	5.06	10.1	15.2	25.3	50.6
1.915	...	5.06	10.1	15.2	25.3	50.6
1.916	...	5.05	10.1	15.2	25.3	50.5
1.917	...	5.05	10.1	15.1	25.2	50.5
1.918	...	5.04	10.1	15.1	25.2	50.4
1.919	...	5.04	10.1	15.1	25.2	50.4
1.920	...	5.03	10.1	15.1	25.2	50.3
1.921	...	5.03	10.0	15.1	25.1	50.3
1.922	...	5.02	10.0	15.1	25.1	50.2
1.923	...	5.01	10.0	15.0	25.1	50.1
1.924	...	5.01	10.0	15.0	25.0	50.1
1.925	...	5.00	10.0	15.0	25.0	50.0
1.926	...	5.00	10.0	15.0	25.0	50.0
1.927	...	4.99	9.99	15.0	25.0	49.9
1.928	...	4.99	9.98	15.0	24.9	49.9
1.929	...	4.98	9.97	15.0	24.9	49.8
1.930	9.96	14.9	24.9	49.8
1.931	9.94	14.9	24.9	49.7
1.932	9.93	14.9	24.8	49.7
1.933	9.92	14.9	24.8	49.6
1.934	9.91	14.9	24.8	49.6
1.935	9.90	14.9	24.8	49.5
1.936	9.89	14.8	24.7	49.5
1.937	9.88	14.8	24.7	49.4
1.938	9.87	14.8	24.7	49.4
1.939	9.86	14.8	24.7	49.3
1.940	9.85	14.8	24.6	49.3
1.941	9.84	14.8	24.6	49.2
1.942	9.83	14.8	24.6	49.2
1.943	9.82	14.7	24.6	49.1
1.944	9.81	14.7	24.5	49.1
1.945	9.80	14.7	24.5	49.0

Table D.3 (continued)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.946	9.79	14.7	24.5	49.0
1.947	9.78	14.7	24.5	48.9
1.948	9.77	14.7	24.4	48.9
1.949	9.76	14.6	24.4	48.8
1.950	9.75	14.6	24.4	48.8
1.951	9.74	14.6	24.4	48.7
1.952	9.73	14.6	24.3	48.7
1.953	9.72	14.6	24.3	48.6
1.954	9.71	14.6	24.3	48.6
1.955	9.70	14.6	24.3	48.5
1.956	9.69	14.5	24.2	48.5
1.957	9.68	14.5	24.2	48.4
1.958	9.67	14.5	24.2	48.4
1.959	9.66	14.5	24.2	48.3
1.960	9.65	14.5	24.1	48.3
1.961	9.64	14.5	24.1	48.2
1.962	9.63	14.5	24.1	48.2
1.963	9.62	14.4	24.1	48.1
1.964	9.61	14.4	24.0	48.1
1.965	9.60	14.4	24.0	48.0
1.966	9.59	14.4	24.0	48.0
1.967	9.58	14.4	24.0	47.9
1.968	9.57	14.4	23.9	47.9
1.969	9.56	14.3	23.9	47.8
1.970	9.56	14.3	23.9	47.8
1.971	9.55	14.3	23.9	47.7
1.972	9.54	14.3	23.8	47.7
1.973	9.53	14.3	23.8	47.6
1.974	9.52	14.3	23.8	47.6
1.975	9.51	14.3	23.8	47.5
1.976	9.50	14.2	23.7	47.5
1.977	9.49	14.2	23.7	47.4
1.978	9.48	14.2	23.7	47.4
1.979	9.47	14.2	23.7	47.4
1.980	9.46	14.2	23.6	47.3
1.981	9.45	14.2	23.6	47.3
1.982	9.44	14.2	23.6	47.2
1.983	9.43	14.1	23.6	47.2
1.984	9.42	14.1	23.6	47.1
1.985	9.41	14.1	23.5	47.1
1.986	9.40	14.1	23.5	47.0
1.987	9.39	14.1	23.5	47.0
1.988	9.38	14.1	23.5	46.9
1.989	9.37	14.1	23.4	46.9
1.990	9.36	14.0	23.4	46.8

Table D.3 (concluded)

Mean diagonal of indentation d mm	Test force F (N)					
	49.03	98.07	196.1	294.2	490.3	980.7
	Vickers hardness					
	HV 5	HV 10	HV 20	HV 30	HV 50	HV 100
1.991	9.35	14.0	23.4	46.8
1.992	9.35	14.0	23.4	46.7
1.993	9.34	14.0	23.3	46.7
1.994	9.33	14.0	23.3	46.6
1.995	9.32	14.0	23.3	46.6
1.996	9.31	14.0	23.3	46.5
1.997	9.30	14.0	23.2	46.5
1.998	9.29	13.9	23.2	46.5
1.999	9.28	13.9	23.2	46.4

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