

CONFIRMED
DECEMBER 2007

Schedule for

Density-composition tables for aqueous solutions of sulphuric acid

UDC 531.756(083.4/.6):[546.226 – 325]

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW



Document Sharing Hub

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Laboratory Apparatus Standards Committee (LBC/-) to Technical Committee LBC/5, upon which the following bodies were represented:

- British Laboratory Ware Association
- Department of Trade and Industry (Laboratory of the Government Chemist)
- Department of Trade and Industry (National Weights and Measures Laboratory)
- Institute of Brewing
- Institute of Petroleum
- National Sulphuric Acid Association
- Royal Society of Chemistry
- Scientific Glassware Association
- Scotch Whisky Association
- Society of Glass Technology

This British Standard, having been prepared under the direction of the Laboratory Apparatus Standards Committee was published under the authority of the Board of BSI and comes into effect on 23 December 1987

© BSI 01-2000

First published September 1937
First revision February 1959
Second revision December 1987

The following BSI references relate to the work on this standard:
Committee reference LBC/5
Draft for comment 86/50537 DC

ISBN 0 580 16220 6

Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
1 Scope	1
2 Basis of Table 1	1
3 Application of Table 1	1
Appendix A Correction of readings taken on BS hydrometers	52
Appendix B BS hydrometers available for use in conjunction with the tables	55
Appendix C Examples of the use of Table 1 in conjunction with BS hydrometers	55
Table 1 — Density-composition table for aqueous solutions of sulphuric acid	2
Table 2 — Corrections to be applied to obtain density at t	52
Table 3 — Temperature corrections for BS hydrometers	53
Table 4 — Surface tensions of aqueous solutions of sulphuric acid at 20 °C	53
Table 5 — Maximum errors introduced by ignoring surface tension when reading BS hydrometers, adjusted for 55 mN/m, in aqueous solutions of sulphuric acid in an ordinary hydrometer jar	54
Table 6 — Maximum errors due to omission of all corrections to BS hydrometers adjusted for 55 mN/m	54
Table 7 — BS hydrometers available for use in aqueous solutions of sulphuric acid	56
Publications referred to	Inside back cover

Foreword

This British Standard has been prepared under the direction of the Laboratory Apparatus Standards Committee.

This British Standard was first published in 1937 and was revised in 1959. This revision supersedes the 1959 edition which is withdrawn.

The United Kingdom participated in the preparation by Technical Committee TC 47, Chemistry, of the International Organization for Standardization (ISO) of the related ISO Recommendation ISO/R 911:1968, but disapproved it on technical grounds. The United Kingdom maintained the disapproval when ISO/R 911:1968 was converted to ISO 911:1977.

Together with hydrometers the tables provide a simple means of determining the strength of any given aqueous solution of sulphuric acid, or making up a solution of known strength. The tables may, of course, be used with other methods of determining density (for example, see BS 733).

The previous edition of this British Standard made reference to density and specific gravity hydrometers complying with BS 718:1953. When BS 718 was revised in 1979 it was aligned as far as possible with the intentions of Technical Committee 48, Laboratory glassware and related apparatus, of the International Organization for Standardization (ISO). The term "specific gravity" was replaced by "relative density", scales of relative density were excluded, and scales marked in kilograms per cubic metre were introduced as an alternative to grams per millilitre. Users who had a continuing need for relative density hydrometers ($d_{60/60}^{\circ}\text{F}$) were referred to ISO 650.

The readings of a $60/60^{\circ}\text{F}$ relative density hydrometer can readily be corrected (see Appendix A) to yield density (in kg/m^3) of the liquid at the temperature at which the hydrometer is used.

Within 1 to 2 parts in 1 000, readings at a temperature t (in $^{\circ}\text{C}$) of a $60/60^{\circ}\text{F}$ relative density hydrometer can be taken as the density (in kg/m^3) at t . To an accuracy which is very frequently adequate (within 1 part in 1 000), the reading at a temperature t between 10°C and 40°C on a 20°C or 15°C density hydrometer complying with BS 718 may be accepted as the density (in kg/m^3) of the liquid at t . Density and relative density hydrometers therefore may often be used without correction. Appendix A gives information on how the highest accuracy can be obtained. Recommendations as to the choice of suitable hydrometers for use in connection with these tables are given in Appendix B. Appendix C gives examples of the use of density-composition tables in conjunction with these hydrometers.

The principal differences between BS 753:1959 and this edition are:

- a) density, in Table 1, is given in kilograms per cubic metre instead of grams per millilitre;
- b) SI units have been used throughout and, where applicable, the tables have been recomputed;
- c) recommendations as to the choice of suitable hydrometers for use in conjunction with Table 1 have been revised to accord with BS 718;
- d) the temperature calculations given in Table 3 have been computed using the value of the thermal cubical expansion coefficient quoted in ISO 1768 for use in the preparation of measurement tables for liquids.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 58, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This British Standard gives a table that enables the composition of an aqueous solution of sulphuric acid to be determined from its density at temperatures between 10 °C and 40 °C.

Appendix A gives information on the corrections which are necessary when density is determined by a hydrometer complying with BS 718¹⁾.

Appendix B gives information on the choice of BS hydrometers that are suitable for the determination of density of sulphuric acid solutions.

Appendix C gives examples of the use of a BS hydrometer in conjunction with Table 1.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

2 Basis of Table 1

Table 1 is based on data obtained from the International Critical Tables, 1928, Vol. III, page 56, which are still accepted as authoritative.

It should be observed that the table relates to mass, not to apparent mass in air.

3 Application of Table 1

3.1 Determination of D_t

Table 1 is arranged primarily for ease in determining the strength of an aqueous solution of sulphuric acid of known density. The density of a solution of known strength can, however, be obtained quite readily from the table. Moreover, by the application of small allowances (see Appendix A) Table 1 can be used to find the strength of solutions of known relative density or the relative density of solutions of known strength.

Consider, for example, a solution containing 10 g of H_2SO_4 in 100 g of solution, i.e. one for which $g = 10$. By looking up the value of D_t corresponding to the value $g = 10$ under any particular temperature in Table 1, the density of the solution at that temperature can be obtained. Thus, for example, the density of the solution is 1 070 kg/m³ at 10 °C, 1 066 kg/m³ at 20 °C, etc. Due allowance, based on the density of water at the various temperatures concerned, can then be made to find the corresponding relative densities at the same temperature as the acid.

It should be observed that the percentage composition g of a solution is independent of its temperature, but G , the number of grams of sulphuric acid in 1 L of solution, varies with the temperature of the solution owing to the change in volume of the solution with change in temperature. Hence, the concentration G should always be associated with a particular temperature. For a given value of G applicable at a particular temperature, Table 1 can be used to obtain the density of the solution at the specified temperature or at any other temperature within the range of the table. The value of G for the solution at temperatures other than the specified one can also be obtained. For example, consider a solution 1 L of which, at 20 °C, contains 200 g of H_2SO_4 . In Table 1 the value of D_t corresponding to $G = 200$ under 20 °C is 1 123 kg/m³ and the corresponding value of g is 17.8 g. By tracing the value $g = 17.8$ g through the table, and interpolating where necessary, the density D_t at various temperatures of the solution containing 200 g of H_2SO_4 in 1 L of solution at 20 °C can be obtained and also the number of grams of H_2SO_4 in 1 L of the solution at various temperatures.

The following are examples of values which may thus be obtained.

t	H_2SO_4 in 100 g of solution	Density of solution at t	H_2SO_4 in 1 L of solution at t
°C	g	kg/m ³	g
10	17.8	1 128	200
20	17.8	1 123	200
30	17.8	1 117	198
40	17.8	1 111	198

¹⁾ From hereon referred to as a BS hydrometer.

3.2 Double entries

Between $D_t = 1\,811\text{ kg/m}^3$ and $D_t = 1\,846\text{ kg/m}^3$ two values of g and two of G are given against certain values of D_t . This is necessary because the density of mixtures of sulphuric acid and water attains a maximum value at a concentration of approximately 97 g of sulphuric acid in 100 g of solution. Hence, over a small range on each side of the maximum, there are two possible concentrations for each particular density. Both values are given in Table 1, the values for the less concentrated solution being given in light type and those for the more concentrated solution in bold type.

Table 1 — Density-composition table for aqueous solutions of sulphuric acid

D_t is the density (mass per unit volume) of solution (in kg/m^3) at a temperature t (in $^\circ\text{C}$) [for many purposes it can be assumed that irrespective of the value of t the reading of a BS density hydrometer at t gives the density D_t , and that the reading of a 60/60 $^\circ\text{F}$ relative density hydrometer at t is numerically 0.001 greater than $D_{t/1000}$ (see Appendix A)].

g is the mass (in g) of H_2SO_4 in 100 g mass of solution.

G is the mass (in g) of H_2SO_4 in a quantity of solution occupying 1 L at the temperature stated at the head of the column.

t	10 $^\circ\text{C}$		12 $^\circ\text{C}$		14 $^\circ\text{C}$		16 $^\circ\text{C}$		18 $^\circ\text{C}$		20 $^\circ\text{C}$		22 $^\circ\text{C}$	
D_t	g	G	g	G	g	G	g	G	g	G	g	G	g	G
1 000	0.0	0	0.1	1	0.1	1	0.1	1	0.2	2	0.3	3	0.3	3
1 001	0.2	2	0.2	2	0.2	3	0.3	3	0.3	3	0.4	4	0.5	5
1 002	0.3	3	0.3	4	0.4	4	0.4	4	0.5	5	0.6	6	0.6	6
1 003	0.5	5	0.3	5	0.5	5	0.6	6	0.6	6	0.7	7	0.8	8
1 004	0.6	6	0.6	6	0.7	7	0.7	7	0.8	8	0.8	8	0.9	9
1 005	0.7	8	0.8	8	0.8	8	0.9	9	0.9	9	1.0	10	1.1	11
1 006	0.9	9	0.9	9	1.0	10	1.0	10	1.1	11	1.1	11	1.2	12
1 007	1.0	10	1.1	11	1.1	11	1.2	12	1.2	12	1.3	13	1.4	14
1 008	1.2	12	1.2	12	1.3	13	1.3	13	1.4	14	1.4	14	1.5	15
1 009	1.3	13	1.3	14	1.4	14	1.5	15	1.5	15	1.6	16	1.7	17
1 010	1.5	15	1.5	15	1.5	16	1.6	16	1.7	17	1.7	17	1.8	18
1 011	1.6	16	1.6	17	1.7	17	1.8	18	1.8	18	1.9	19	2.0	20
1 012	1.7	18	1.8	18	1.8	19	1.9	19	2.0	20	2.0	21	2.1	21
1 013	1.9	19	1.9	20	2.0	20	2.0	21	2.1	21	2.2	22	2.3	23
1 014	2.0	21	2.1	21	2.1	22	2.2	22	2.3	23	2.3	24	2.4	24
1 015	2.2	22	2.2	23	2.3	23	2.3	24	2.4	24	2.5	25	2.6	26
1 016	2.3	24	2.4	24	2.4	25	2.5	25	2.6	26	2.6	27	2.7	28
1 017	2.5	25	2.5	26	2.6	26	2.6	27	2.7	28	2.8	28	2.9	29
1 018	2.6	27	2.7	27	2.7	28	2.8	28	2.9	29	2.9	30	3.0	31
1 019	2.8	28	2.8	29	2.9	29	2.9	30	3.0	31	3.1	31	3.2	32
1 020	2.9	30	3.0	30	3.0	31	3.1	32	3.2	32	3.2	33	3.3	34
1 021	3.1	31	3.1	32	3.2	32	3.2	33	3.3	34	3.4	35	3.5	36
1 022	3.2	33	3.3	33	3.3	34	3.4	35	3.5	35	3.5	36	3.6	37
1 023	3.4	34	3.4	35	3.5	35	3.5	36	3.6	37	3.7	38	3.8	39
1 024	3.5	36	3.6	36	3.6	37	3.7	38	3.8	39	3.8	39	3.9	40
1 025	3.6	37	3.7	38	3.8	39	3.8	39	3.9	40	4.0	41	4.1	42
1 026	3.8	39	3.8	40	3.9	40	4.0	41	4.1	42	4.2	43	4.2	44
1 027	3.9	40	4.0	41	4.1	42	4.1	42	4.2	43	4.3	44	4.4	45
1 028	4.1	42	4.1	43	4.2	43	4.3	44	4.4	45	4.4	46	4.5	47
1 029	4.2	43	4.3	44	4.4	45	4.4	46	4.5	46	4.6	47	4.7	48
1 030	4.4	45	4.4	46	4.5	46	4.6	47	4.7	48	4.7	49	4.9	50
1 031	4.5	46	4.6	47	4.6	48	4.7	49	4.8	49	4.9	51	5.0	52
1 032	4.7	48	4.7	49	4.8	49	4.9	50	5.0	51	5.0	52	5.1	53

Table 1 — Density-composition table for aqueous solutions of sulphuric acid

D_t is the density (mass per unit volume) of solution (in kg/m³) at a temperature t (in °C) [for many purposes it can be assumed that irrespective of the value of t the reading of a BS density hydrometer at t gives the density D_p , and that the reading of a 60/60 °F relative density hydrometer at t is numerically 0.001 greater than $D_{t/1000}$ (see Appendix A)].

g is the mass (in g) of H₂SO₄ in 100 g mass of solution.

G is the mass (in g) of H₂SO₄ in a quantity of solution occupying 1 L at the temperature stated at the head of the column.

24 °C		26 °C		28 °C		30 °C		32 °C		34 °C		36 °C		38 °C		40 °C		t
g	G	g	G	g	G	g	G	g	G	g	G	g	G	g	G	g	G	D_t
0.4	4	0.5	5	0.6	6	0.7	7	0.8	8	0.9	9	1.0	10	1.1	11	1.2	12	1 000
0.5	6	0.6	6	0.7	7	0.8	8	0.9	9	1.0	10	1.1	12	1.3	13	1.4	14	1 001
0.7	7	0.8	8	0.9	9	1.0	10	1.1	11	1.2	12	1.3	13	1.4	14	1.5	15	1 002
0.8	9	0.9	9	1.0	10	1.1	11	1.2	12	1.3	14	1.5	15	1.6	16	1.7	17	1 003
1.0	10	1.1	11	1.2	12	1.3	13	1.4	14	1.5	15	1.6	16	1.7	17	1.8	18	1 004
1.1	12	1.2	12	1.3	13	1.4	14	1.5	15	1.7	17	1.8	18	1.9	19	2.0	20	1 005
1.3	13	1.4	14	1.5	15	1.6	16	1.7	17	1.8	18	1.9	19	2.0	20	2.2	22	1 006
1.4	14	1.5	15	1.6	16	1.7	17	1.8	19	2.0	20	2.1	21	2.2	22	2.3	22	1 007
1.6	16	1.7	17	1.8	18	1.9	19	2.0	20	2.1	21	2.2	22	2.4	24	2.5	25	1 008
1.7	18	1.8	18	1.9	20	2.0	21	2.2	22	2.3	23	2.4	24	2.5	25	2.6	27	1 009
1.9	19	2.0	20	2.1	21	2.2	22	2.3	23	2.4	25	2.5	26	2.7	27	2.8	28	1 010
2.1	21	2.1	22	2.2	23	2.4	24	2.5	25	2.6	26	2.7	27	2.8	29	3.0	30	1 011
2.2	22	2.3	23	2.4	24	2.5	25	2.6	27	2.7	28	2.9	29	3.0	30	3.1	31	1 012
2.4	24	2.5	25	2.6	26	2.7	27	2.8	28	2.9	29	3.0	31	3.1	32	3.3	33	1 013
2.5	25	2.6	26	2.7	27	2.8	29	2.9	30	3.0	31	3.2	32	3.3	33	3.4	35	1 014
2.7	27	2.8	28	2.9	29	3.0	30	3.1	31	3.2	32	3.3	34	3.5	35	3.6	36	1 015
2.8	29	2.9	30	3.0	31	3.1	32	3.3	33	3.4	34	3.6	35	3.6	37	3.7	38	1 016
3.0	30	3.1	31	3.2	32	3.3	33	3.4	35	3.5	36	3.7	37	3.8	38	3.9	40	1 017
3.1	32	3.2	33	3.3	34	3.4	35	3.6	36	3.7	37	3.8	39	3.9	40	4.1	41	1 018
3.3	33	3.4	34	3.5	35	3.6	37	3.7	38	3.8	39	4.0	40	4.1	42	4.2	43	1 019
3.4	35	3.5	36	3.6	37	3.8	38	3.9	40	4.0	41	4.1	42	4.2	43	4.4	45	1 020
3.6	37	3.7	38	3.8	39	3.9	40	4.0	41	4.2	42	4.3	44	4.4	45	4.5	46	1 021
3.7	38	3.8	39	4.0	40	4.1	41	4.2	43	4.3	44	4.4	45	4.6	47	4.7	48	1 022
3.9	40	4.0	41	4.1	42	4.2	43	4.3	44	4.5	46	4.6	47	4.7	48	4.8	50	1 023
4.0	41	4.2	43	4.3	44	4.4	45	4.5	46	4.6	47	4.7	49	4.9	50	5.0	51	1 024
4.2	43	4.3	44	4.4	45	4.5	46	4.7	48	4.8	49	4.9	50	5.0	51	5.2	53	1 025
4.4	45	4.5	46	4.6	47	4.7	48	4.8	49	4.9	50	5.0	52	5.2	53	5.3	54	1 026
4.5	46	4.6	47	4.7	48	4.8	50	5.0	51	5.1	52	5.2	53	5.3	55	5.5	56	1 027
4.7	48	4.8	49	4.9	50	5.0	51	5.1	53	5.2	54	5.4	55	5.5	56	5.6	58	1 028
4.8	49	4.9	51	5.0	52	5.1	53	5.3	54	5.4	55	5.5	57	5.6	58	5.8	59	1 029
5.0	51	5.1	52	5.2	53	5.3	54	5.4	56	5.5	57	5.7	58	5.8	60	5.9	61	1 030
5.1	53	5.2	54	5.3	55	5.4	56	5.6	57	5.7	59	5.8	60	5.9	61	6.1	65	1 031
5.3	54	5.4	56	5.5	56	5.6	58	5.7	59	5.8	60	6.0	62	6.1	63	6.2	64	1 032

Table 1 — Density-composition table for aqueous solutions of sulphuric acid

D_t is the density (mass per unit volume) of solution (in kg/m³) at a temperature t (in °C) [for many purposes it can be assumed that irrespective of the value of t the reading of a BS density hydrometer at t gives the density D_t , and that the reading of a 60/60 °F relative density hydrometer at t is numerically 0.001 greater than $D_{t/1000}$ (see Appendix A)].

g is the mass (in g) of H₂SO₄ in 100 g mass of solution.

G is the mass (in g) of H₂SO₄ in a quantity of solution occupying 1 L at the temperature stated at the head of the column.

t	10 °C		12 °C		14 °C		16 °C		18 °C		20 °C		22 °C	
D_t	g	G	g	G	g	G	g	G	g	G	g	G	g	G
1 033	4.8	50	4.9	50	4.9	51	5.0	52	5.1	53	5.2	54	5.3	55
1 034	4.9	51	5.0	52	5.1	53	5.2	53	5.2	54	5.3	55	5.4	56
1 035	5.1	53	5.2	53	5.2	54	5.3	55	5.4	56	5.5	57	5.6	58
1 036	5.2	54	5.3	55	5.4	56	5.5	57	5.5	57	5.6	58	5.7	59
1 037	5.4	56	5.5	57	5.5	57	5.6	58	5.7	59	5.8	60	5.9	61
1 038	5.5	57	5.6	58	5.7	59	5.8	60	5.8	61	5.9	62	6.0	63
1 039	5.7	59	5.7	60	5.8	60	5.9	61	6.0	62	6.1	63	6.2	64
1 040	5.8	60	5.9	61	6.0	62	6.0	63	6.1	64	6.2	65	6.3	66
1 041	5.9	62	6.0	63	6.1	64	6.2	64	6.3	65	6.4	66	6.5	67
1 042	6.1	63	6.2	64	6.2	65	6.3	66	6.4	67	6.5	68	6.6	69
1 043	6.2	65	6.3	66	6.4	67	6.5	68	6.6	68	6.7	69	6.8	71
1 044	6.4	67	6.5	67	6.5	68	6.6	69	6.7	70	6.8	71	6.9	72
1 045	6.5	68	6.6	69	6.7	70	6.8	71	6.9	72	7.0	73	7.1	74
1 046	6.7	70	6.7	71	6.8	71	6.9	72	7.0	73	7.1	74	7.2	76
1 047	6.8	71	6.9	72	7.0	73	7.1	74	7.1	75	7.2	76	7.4	77
1 048	6.9	73	7.0	74	7.1	75	7.2	75	7.3	76	7.4	77	7.5	79
1 049	7.1	74	7.2	75	7.3	76	7.3	77	7.4	78	7.5	79	7.7	80
1 050	7.2	76	7.3	77	7.4	78	7.5	79	7.6	80	7.7	81	7.8	82
1 051	7.4	77	7.5	78	7.5	79	7.6	80	7.7	81	7.8	82	7.9	83
1 052	7.5	79	7.6	80	7.7	81	7.8	82	7.9	83	8.0	84	8.1	85
1 053	7.6	80	7.7	81	7.8	82	7.9	83	8.0	84	8.1	86	8.2	87
1 054	7.8	82	7.9	83	8.0	84	8.1	85	8.2	86	8.3	87	8.4	88
1 055	7.9	84	8.0	85	8.1	85	8.2	87	8.3	88	8.4	89	8.5	90
1 056	8.1	85	8.2	86	8.2	87	8.3	88	8.4	89	8.6	90	8.7	91
1 057	8.2	87	8.3	88	8.4	89	8.5	90	8.6	91	8.7	92	8.8	93
1 058	8.3	88	8.4	89	8.5	90	8.6	91	0.7	92	8.8	93	9.0	95
1 059	8.5	89	8.6	91	8.7	92	8.8	93	8.9	94	9.0	95	9.1	96
1 060	8.6	91	8.7	92	8.8	93	8.9	95	9.0	96	9.1	97	9.2	98
1 061	8.7	93	8.8	94	8.9	95	9.1	96	9.2	97	9.3	98	9.4	100
1 062	8.9	94	9.0	95	9.1	96	9.2	98	9.3	99	9.4	100	9.5	101
1 063	9.0	96	9.1	97	9.2	98	9.3	99	9.4	100	9.6	102	9.7	103
1 064	9.2	98	9.3	99	9.4	100	9.5	101	9.6	102	9.7	103	9.8	104
1 065	9.3	99	9.4	100	9.5	101	9.6	102	9.7	104	9.8	105	10.0	106
1 066	9.4	101	9.6	102	9.6	103	9.8	104	9.9	105	10.0	106	10.1	108
1 067	9.6	102	9.7	103	9.8	104	9.9	106	10.0	107	10.1	108	10.2	109
1 068	9.7	104	9.8	105	9.9	106	10.0	107	10.2	109	10.3	110	10.4	111

Table 1 — Density-composition table for aqueous solutions of sulphuric acid

D_t is the density (mass per unit volume) of solution (in kg/m³) at a temperature t (in °C) [for many purposes it can be assumed that irrespective of the value of t the reading of a BS density hydrometer at t gives the density D_t , and that the reading of a 60/60 °F relative density hydrometer at t is numerically 0.001 greater than $D_{t/1000}$ (see Appendix A)].

g is the mass (in g) of H₂SO₄ in 100 g mass of solution.

G is the mass (in g) of H₂SO₄ in a quantity of solution occupying 1 L at the temperature stated at the head of the column.

24 °C		26 °C		28 °C		30 °C		32 °C		34 °C		36 °C		38 °C		40 °C		t
g	G	g	G	g	G	g	G	g	G	g	G	g	G	g	G	g	G	D_t
5.4	56	5.5	57	5.6	58	5.7	59	5.9	61	6.0	62	6.1	63	6.2	65	6.4	66	1 033
5.5	57	5.7	59	5.8	60	5.9	61	6.0	62	6.1	63	6.3	65	6.4	66	6.5	68	1 034
5.7	59	5.8	60	5.9	61	6.0	63	6.2	64	6.3	65	6.4	66	6.6	68	6.7	69	1 035
5.8	61	6.0	62	6.1	63	6.2	64	6.3	65	6.4	67	6.6	68	6.7	69	6.8	71	1 036
6.0	62	6.1	63	6.2	65	6.3	66	6.5	67	6.6	68	6.7	70	6.9	71	7.0	72	1 037
6.1	64	6.3	65	6.4	66	6.5	67	6.6	69	6.7	70	6.9	71	7.0	73	7.1	74	1 038
6.3	65	6.4	66	6.5	68	6.6	69	6.8	70	6.9	71	7.0	73	7.2	74	7.3	76	1 039
6.4	67	6.6	68	6.7	69	6.8	71	6.9	72	7.0	73	7.2	75	7.3	76	7.4	77	1 040
6.6	68	6.7	70	6.8	71	6.9	72	7.1	73	7.2	75	7.3	76	7.5	78	7.6	79	1 041
6.7	70	6.9	71	7.0	73	7.1	74	7.2	75	7.3	76	7.5	78	7.6	79	7.7	81	1 042
6.9	72	7.0	73	7.1	74	7.2	76	7.4	77	7.5	78	7.6	79	7.8	81	7.9	82	1 043
7.0	73	7.1	75	7.3	76	7.4	77	7.5	78	7.6	80	7.8	81	7.9	83	8.0	84	1 044
7.2	75	7.3	76	7.4	77	7.5	79	7.7	80	7.8	81	7.9	83	8.1	84	8.2	86	1 045
7.3	77	7.4	78	7.6	79	7.7	80	7.8	82	7.9	83	8.1	84	8.2	86	8.4	87	1 046
7.5	78	7.6	79	7.7	81	7.8	82	8.0	83	8.1	85	8.2	86	8.4	88	8.5	89	1 047
7.6	80	7.7	81	7.9	82	8.0	84	8.1	85	8.2	86	8.4	88	8.5	89	8.7	91	1 048
7.8	81	7.9	83	8.0	84	8.1	85	8.3	87	8.4	88	8.5	89	8.7	91	8.8	92	1 049
7.9	83	8.0	84	8.1	86	8.3	87	8.4	88	8.5	90	8.7	91	8.8	93	9.0	94	1 050
8.1	85	8.2	86	8.3	87	8.4	89	8.6	90	8.7	91	8.8	93	9.0	94	9.1	96	1 051
8.2	86	8.3	88	8.4	89	8.6	90	8.7	92	8.8	93	9.0	94	9.1	96	9.3	97	1 052
8.3	88	8.5	89	8.6	90	8.7	92	8.9	93	9.0	95	9.1	96	9.3	98	9.4	99	1 053
8.5	89	8.6	91	8.4	92	8.9	93	9.0	95	9.1	96	9.3	98	9.4	99	9.6	101	1 054
8.6	91	8.8	92	8.9	94	9.0	95	9.2	97	9.3	98	9.4	99	9.6	101	9.7	102	1 055
8.8	93	8.9	94	9.0	95	9.2	97	9.3	98	9.4	100	9.6	101	9.7	102	9.9	104	1 056
8.9	94	9.0	96	9.2	97	9.3	98	9.4	100	9.6	101	9.7	103	9.9	104	10.0	106	1 057
9.1	96	9.2	97	9.3	99	9.5	100	9.6	101	9.7	103	9.9	104	10.0	106	10.2	107	1 058
9.2	97	9.3	99	9.5	100	9.6	101	9.7	103	9.9	104	10.0	106	10.2	107	10.3	109	1 059
9.4	99	9.5	100	9.6	102	9.8	103	9.9	105	10.0	106	10.2	107	10.3	109	10.4	111	1 060
9.5	101	9.6	102	9.7	103	9.9	105	10.0	106	10.2	108	10.3	109	10.4	111	10.6	112	1 061
9.7	102	9.8	104	9.9	105	10.0	107	10.2	108	10.3	109	10.5	111	10.6	113	10.7	114	1 062
9.8	104	9.9	105	10.0	107	10.2	108	10.3	110	10.5	111	10.6	113	10.7	114	10.9	116	1 063
9.9	106	10.1	107	10.2	108	10.3	110	10.5	111	10.6	113	10.8	114	10.9	116	11.0	118	1 064
10.1	107	10.2	109	10.3	110	10.5	112	10.6	113	10.8	114	10.9	116	11.0	118	11.2	119	1 065
10.2	109	10.4	110	10.5	112	10.6	113	10.8	115	10.9	116	11.0	118	11.2	119	11.3	121	1 066
10.4	111	10.5	112	10.6	113	10.8	115	10.9	117	11.0	118	11.2	119	11.3	121	11.5	123	1 067
10.5	112	10.6	114	10.8	115	10.9	117	11.1	118	11.2	120	11.3	121	11.5	123	11.6	124	1 068

Table 1 — Density-composition table for aqueous solutions of sulphuric acid

D_t is the density (mass per unit volume) of solution (in kg/m³) at a temperature t (in °C) [for many purposes it can be assumed that irrespective of the value of t the reading of a BS density hydrometer at t gives the density D_t , and that the reading of a 60/60 °F relative density hydrometer at t is numerically 0.001 greater than $D_{t/1000}$ (see Appendix A)].

g is the mass (in g) of H₂SO₄ in 100 g mass of solution.

G is the mass (in g) of H₂SO₄ in a quantity of solution occupying 1 L at the temperature stated at the head of the column.

t	10 °C		12 °C		14 °C		16 °C		18 °C		20 °C		22 °C	
D_t	g	G	g	G	g	G	g	G	g	G	g	G	g	G
1 069	9.9	105	10.0	107	10.1	108	10.2	109	10.3	110	10.4	111	10.5	113
1 070	10.0	107	10.1	108	10.2	109	10.3	110	10.4	112	10.6	113	10.7	114
1 071	10.1	109	10.3	110	10.3	111	10.5	112	10.6	113	10.7	115	10.8	116
1 072	10.3	110	10.4	111	10.5	112	10.6	114	10.7	115	10.8	116	11.0	117
1 073	10.4	112	10.5	113	10.6	114	10.7	115	10.9	117	11.0	118	11.1	119
1 074	10.6	113	10.7	114	10.8	116	10.9	117	11.0	118	11.1	120	11.2	121
1 075	10.7	115	10.8	116	10.9	117	11.0	118	11.1	120	11.3	121	11.4	122
1 076	10.8	116	10.9	118	11.0	119	11.2	120	11.3	121	11.4	123	11.5	124
1 077	11.0	118	11.1	119	11.2	120	11.3	122	11.4	123	11.6	124	11.7	126
1 078	11.1	120	11.2	121	11.3	122	11.4	123	11.6	125	11.7	126	11.8	127
1 079	11.2	121	11.4	122	11.5	124	11.6	125	11.7	126	11.8	128	11.9	129
1 080	11.4	123	11.5	125	11.6	125	11.7	127	11.8	128	12.0	129	12.1	130
1 081	11.5	124	11.6	126	11.7	127	11.9	128	12.0	130	12.1	131	12.2	132
1 082	11.6	126	11.8	127	11.9	129	12.0	130	12.1	131	12.3	133	12.4	134
1 083	11.8	128	11.9	129	12.0	130	12.1	131	12.3	133	12.4	134	12.5	135
1 084	11.9	129	12.0	131	12.1	132	12.3	133	12.4	134	12.5	136	12.6	137
1 085	12.1	131	12.2	132	12.3	133	12.4	135	12.5	136	12.7	137	12.8	139
1 086	12.2	132	12.3	134	12.4	135	12.5	136	12.7	138	12.8	139	12.9	140
1 087	12.3	134	12.4	135	12.6	137	12.7	138	12.8	139	12.9	141	13.1	142
1 088	12.5	136	12.6	137	12.7	138	12.8	139	12.9	141	13.1	142	13.2	144
1 089	12.6	137	12.7	138	12.8	140	13.0	141	13.1	142	13.2	144	13.3	145
1 090	12.7	139	12.9	140	13.0	141	13.1	143	13.2	144	13.4	146	13.5	147
1 091	12.9	140	13.0	142	13.1	143	13.2	144	13.4	146	13.5	147	13.6	149
1 092	13.0	142	13.1	143	13.2	145	13.4	146	13.5	147	13.6	149	13.8	150
1 093	13.1	144	13.3	145	13.4	146	13.5	148	13.6	149	13.8	151	13.9	152
1 094	13.3	145	13.4	146	13.5	148	13.6	149	13.8	151	13.9	152	14.0	154
1 095	13.4	147	13.5	148	13.6	149	13.8	151	13.9	152	14.0	154	14.2	155
1 096	13.5	148	13.7	150	13.8	151	13.9	153	14.0	154	14.2	155	14.3	157
1 097	13.7	150	13.8	151	13.9	153	14.1	154	14.2	155	14.3	157	14.5	159
1 098	13.8	152	13.9	153	14.1	154	14.2	156	14.3	157	14.5	159	14.6	160
1 099	13.9	153	14.1	155	14.2	156	14.3	157	14.5	159	14.6	160	14.7	162
1 100	14.1	155	14.2	156	14.3	158	14.5	159	14.6	160	14.7	162	14.9	163
1 101	14.2	156	14.3	158	14.5	159	14.6	161	14.7	162	14.9	164	15.0	165
1 102	14.3	158	14.5	159	14.6	161	14.7	162	14.9	164	15.0	165	15.1	167
1 103	14.5	160	14.6	161	14.7	162	14.9	164	15.0	165	15.1	167	15.3	168
1 104	14.6	161	14.7	163	14.9	164	15.0	166	15.1	167	15.3	169	15.4	170

Table 1 — Density-composition table for aqueous solutions of sulphuric acid

D_t is the density (mass per unit volume) of solution (in kg/m³) at a temperature t (in °C) [for many purposes it can be assumed that irrespective of the value of t the reading of a BS density hydrometer at t gives the density D_{15} and that the reading of a 60/60 °F relative density hydrometer at t is numerically 0.001 greater than $D_{15/1000}$ (see Appendix A)].

g is the mass (in g) of H₂SO₄ in 100 g mass of solution.

G is the mass (in g) of H₂SO₄ in a quantity of solution occupying 1 L at the temperature stated at the head of the column.

24 °C		26 °C		28 °C		30 °C		32 °C		34 °C		36 °C		38 °C		40 °C		t
g	G	g	G	g	G	g	G	g	G	g	G	g	G	g	G	g	G	D_t
10.7	114	10.8	115	10.9	117	11.1	118	11.2	120	11.3	121	11.5	123	11.6	124	11.8	126	1 069
10.8	116	10.9	117	11.1	118	11.2	120	11.3	121	11.5	123	11.6	124	11.8	126	11.9	128	1 070
10.9	117	11.1	119	11.2	120	11.3	121	11.5	123	11.6	125	11.8	126	11.9	128	12.1	129	1 071
11.1	119	11.2	120	11.3	122	11.5	123	11.6	125	11.8	126	11.9	128	12.1	129	12.2	131	1 072
11.2	120	11.4	122	11.5	123	11.6	125	11.8	126	11.9	128	12.1	129	12.2	131	12.4	133	1 073
11.4	122	11.5	123	11.6	125	11.8	126	11.9	128	12.1	130	12.2	131	12.4	133	12.5	134	1 074
11.5	124	11.6	125	11.8	127	11.9	128	12.1	130	12.2	131	12.4	133	12.5	134	12.7	136	1 075
11.6	125	11.8	127	11.9	128	12.1	130	12.2	131	12.3	133	12.5	134	12.6	136	12.8	138	1 076
11.8	127	11.9	128	12.1	130	12.2	131	12.3	133	12.5	135	12.6	136	12.8	138	12.9	139	1 077
11.9	129	12.1	130	12.2	132	12.3	133	12.5	135	12.6	136	12.8	138	12.9	139	13.1	141	1 078
12.1	130	12.2	132	12.3	133	12.5	135	12.6	136	12.8	138	12.9	140	13.1	141	13.2	143	1 079
12.2	132	12.3	133	12.5	135	12.6	136	12.8	138	12.9	140	13.1	141	13.2	143	13.4	144	1 080
12.4	134	12.5	135	12.6	137	12.8	138	12.9	140	13.1	141	13.2	143	13.4	144	13.5	146	1 081
12.5	135	12.6	137	12.8	138	12.9	140	13.1	141	13.2	143	13.4	144	13.5	146	13.7	148	1 082
12.6	137	12.8	138	12.9	140	13.1	141	13.2	143	13.4	145	13.5	146	13.6	148	13.8	149	1 083
12.8	139	12.9	140	13.1	142	13.2	143	13.3	145	13.5	146	13.6	148	13.8	149	13.9	151	1 084
12.9	140	13.1	142	13.2	143	13.3	145	13.5	146	13.6	148	13.8	149	13.9	151	14.1	153	1 085
13.1	142	13.2	143	13.3	145	13.5	146	13.6	148	13.8	150	13.9	151	14.1	153	14.2	155	1 086
13.2	143	13.3	145	13.5	146	13.6	148	13.8	150	13.9	151	14.1	153	14.2	154	14.4	156	1 087
13.3	145	13.5	147	13.6	148	13.8	150	13.9	151	14.1	153	14.2	154	14.4	156	14.5	158	1 088
13.5	147	13.6	148	13.8	150	13.9	151	14.0	153	14.2	155	14.3	156	14.5	158	14.7	160	1 089
13.6	148	13.7	150	13.9	151	14.0	153	14.2	155	14.3	156	14.5	158	14.6	160	14.8	161	1 090
13.7	150	13.9	152	14.0	153	14.2	155	14.3	156	14.5	158	14.6	160	14.8	161	14.9	163	1 091
13.9	152	14.0	153	14.2	155	14.3	156	14.5	158	14.6	160	14.8	161	14.9	163	15.1	165	1 092
14.0	153	14.2	155	14.3	156	14.5	158	14.6	160	14.8	161	14.9	163	15.1	165	15.2	166	1 093
14.2	155	14.3	157	14.5	158	14.6	160	14.7	161	14.9	163	15.1	165	15.2	166	15.4	168	1 094
14.3	157	14.4	158	14.6	160	14.7	162	14.9	163	15.0	165	15.2	167	15.4	168	15.5	170	1 095
14.4	158	14.6	160	14.7	161	14.9	163	15.0	165	15.2	166	15.3	168	15.5	170	15.6	172	1 096
14.6	160	14.7	161	14.9	163	15.0	165	15.2	166	15.3	168	15.5	170	15.6	171	15.8	173	1 097
14.7	162	14.9	163	15.0	165	15.2	167	15.3	168	15.5	170	15.6	172	15.8	173	15.9	175	1 098
14.9	163	15.0	165	15.2	166	15.3	168	15.4	170	15.6	171	15.8	173	15.9	175	16.1	177	1 099
15.0	165	15.1	167	15.3	168	15.4	170	15.6	171	15.7	173	15.9	175	16.1	177	16.2	178	1 100
15.1	167	15.3	168	15.4	170	15.6	172	15.7	173	15.9	175	16.0	177	16.2	178	16.3	180	1 101
15.3	168	15.4	170	15.6	172	15.7	173	15.9	175	16.0	177	16.2	178	16.3	180	16.5	182	1 102
15.4	170	15.6	172	15.7	173	15.9	175	16.0	177	16.2	178	16.3	180	16.5	182	16.6	183	1 103
15.5	171	15.7	173	15.8	175	16.0	177	16.2	178	16.3	180	16.5	182	16.6	183	16.8	185	1 104

Table 1 — Density-composition table for aqueous solutions of sulphuric acid

D_t is the density (mass per unit volume) of solution (in kg/m³) at a temperature t (in °C) [for many purposes it can be assumed that irrespective of the value of t the reading of a BS density hydrometer at t gives the density D_t , and that the reading of a 60/60 °F relative density hydrometer at t is numerically 0.001 greater than $D_{t/1000}$ (see Appendix A)].

g is the mass (in g) of H₂SO₄ in 100 g mass of solution.

G is the mass (in g) of H₂SO₄ in a quantity of solution occupying 1 L at the temperature stated at the head of the column.

t	10 °C		12 °C		14 °C		16 °C		18 °C		20 °C		22 °C	
D_t	g	G	g	G	g	G	g	G	g	G	g	G	g	G
1 105	14.7	163	14.9	164	15.0	166	15.1	167	15.3	169	15.4	170	15.5	172
1 106	14.9	165	15.0	166	15.1	167	15.3	169	15.4	170	15.5	172	15.7	173
1 107	15.0	166	15.1	168	15.3	169	15.4	170	15.5	172	15.7	173	15.8	175
1 108	15.1	168	15.3	169	15.4	171	15.5	172	15.7	174	15.8	175	15.9	177
1 109	15.3	169	15.4	171	15.5	172	15.7	174	15.8	175	15.9	177	16.1	178
1 110	15.4	171	15.5	173	15.7	174	15.8	175	15.9	177	16.1	178	16.2	180
1 111	15.5	173	15.7	174	15.8	176	15.9	177	16.1	179	16.2	180	16.4	182
1 112	15.7	174	15.8	176	15.9	177	16.1	179	16.2	180	16.4	182	16.5	183
1 113	15.8	176	15.9	177	16.1	179	16.2	180	16.3	182	16.5	183	16.6	185
1 114	15.9	177	16.1	179	16.2	180	16.3	182	16.5	183	16.6	185	16.8	187
1 115	16.1	179	16.2	181	16.3	182	16.5	184	16.6	185	16.8	187	16.9	188
1 116	16.2	181	16.3	182	16.5	184	16.6	185	16.7	187	16.9	188	17.0	190
1 117	16.3	182	16.5	184	16.6	185	16.7	187	16.9	189	17.0	190	17.2	192
1 118	16.5	184	16.6	185	16.7	187	16.9	189	17.0	190	17.2	192	17.3	193
1 119	16.6	186	16.7	187	16.9	189	17.0	190	17.2	192	17.3	194	17.4	195
1 120	16.7	187	16.9	189	17.0	190	17.1	192	17.3	194	17.4	195	17.6	197
1 121	16.9	189	17.0	190	17.1	192	17.3	194	17.4	195	17.6	197	17.7	198
1 122	17.0	191	17.1	192	17.3	194	17.4	195	17.5	197	17.7	199	17.8	200
1 123	17.1	192	17.3	194	17.4	195	17.5	197	17.7	199	17.8	200	18.0	202
1 124	17.2	194	17.4	195	17.5	197	17.7	199	17.8	200	18.0	202	18.1	203
1 125	17.4	196	17.5	197	17.7	199	17.8	200	17.9	202	18.1	204	18.2	205
1 126	17.5	197	17.6	199	17.8	200	17.9	202	18.1	204	18.2	205	18.4	207
1 127	17.6	199	17.8	200	17.9	202	18.1	204	18.2	205	18.4	207	18.5	208
1 128	17.8	200	17.9	202	18.1	204	18.2	205	18.3	207	18.5	209	18.6	210
1 129	17.9	202	18.0	204	18.2	205	18.3	207	18.5	209	18.6	210	18.8	212
1 130	18.0	204	18.2	205	18.3	207	18.5	209	18.6	210	18.8	212	18.9	214
1 131	18.2	205	18.3	207	18.4	209	18.6	210	18.7	212	18.9	214	19.0	215
1 132	18.3	207	18.4	209	18.6	210	18.7	212	18.9	214	19.0	215	19.2	217
1 133	18.4	209	18.6	210	18.7	212	18.9	214	19.0	215	19.2	217	19.3	219
1 134	18.5	210	18.7	212	18.8	214	19.0	215	19.1	217	19.3	219	19.4	220
1 135	18.7	212	18.8	214	19.0	215	19.1	217	19.3	219	19.4	220	19.6	222
1 136	18.8	214	18.9	215	19.1	217	19.2	219	19.4	220	19.6	222	19.7	224
1 137	18.9	215	19.1	217	19.2	219	19.4	220	19.5	222	19.7	224	19.8	226
1 138	19.1	217	19.2	218	19.4	220	19.5	222	19.7	224	19.8	226	20.0	227
1 139	19.2	219	19.3	220	19.5	222	19.6	224	19.8	225	19.9	227	20.1	229
1 140	19.3	220	19.5	222	19.6	224	19.8	225	19.9	227	20.1	229	20.2	231

Table 1 — Density-composition table for aqueous solutions of sulphuric acid

D_t is the density (mass per unit volume) of solution (in kg/m³) at a temperature t (in °C) [for many purposes it can be assumed that irrespective of the value of t the reading of a BS density hydrometer at t gives the density D_t , and that the reading of a 60/60 °F relative density hydrometer at t is numerically 0.001 greater than $D_{t/1000}$ (see Appendix A)].

g is the mass (in g) of H₂SO₄ in 100 g mass of solution.

G is the mass (in g) of H₂SO₄ in a quantity of solution occupying 1 L at the temperature stated at the head of the column.

24 °C		26 °C		28 °C		30 °C		32 °C		34 °C		36 °C		38 °C		40 °C		t
g	G	g	G	g	G	g	G	g	G	g	G	g	G	g	G	g	G	D_t
15.7	173	15.8	175	16.0	177	16.1	178	16.3	180	16.4	182	16.6	183	16.7	185	16.9	187	1 105
15.8	175	16.0	177	16.1	178	16.3	180	16.4	182	16.6	183	16.7	185	16.9	187	17.0	188	1 106
16.0	177	16.1	178	16.3	180	16.4	182	16.6	183	16.7	185	16.9	187	17.0	188	17.2	190	1 107
16.1	178	16.2	180	16.4	182	16.5	183	16.7	185	16.8	187	17.0	188	17.2	190	17.3	192	1 108
16.2	180	16.4	182	16.5	183	16.7	185	16.8	187	17.0	188	17.1	190	17.3	192	17.5	194	1 109
16.4	182	16.5	183	16.7	185	16.8	187	17.0	188	17.1	190	17.3	192	17.4	193	17.6	195	1 110
16.5	183	16.6	185	16.8	187	17.0	188	17.1	190	17.3	192	17.4	194	17.6	195	17.7	197	1 111
16.6	185	16.8	187	16.9	188	17.1	190	17.2	192	17.4	193	17.6	195	17.7	197	17.9	199	1 112
16.8	187	16.9	188	17.1	190	17.2	192	17.4	193	17.5	195	17.7	197	17.8	199	18.0	200	1 113
16.9	188	17.1	190	17.2	192	17.4	193	17.5	195	17.7	197	17.8	199	18.0	200	18.2	202	1 114
17.0	190	17.2	192	17.3	193	17.5	195	17.7	197	17.8	199	18.0	200	18.1	202	18.3	204	1 115
17.2	192	17.3	193	17.5	195	17.6	197	17.8	199	17.9	200	18.1	202	18.3	204	18.4	206	1 116
17.3	193	17.5	195	17.6	197	17.8	198	17.9	200	18.1	202	18.2	204	18.4	206	18.6	207	1 117
17.4	195	17.6	197	17.7	198	17.9	200	18.1	202	18.2	204	18.4	205	18.5	207	18.7	209	1 118
17.6	197	17.7	198	17.9	200	18.0	202	18.2	204	18.3	205	18.5	207	18.7	209	18.8	211	1 119
17.7	198	17.9	200	18.0	202	18.2	204	18.3	205	18.5	207	18.6	209	18.8	211	19.0	212	1 120
17.9	200	18.0	202	18.2	203	18.3	205	18.5	207	18.6	209	18.8	211	18.9	212	19.1	214	1 121
18.0	202	18.1	204	18.3	205	18.4	207	18.6	209	18.8	210	18.9	212	19.1	214	19.2	216	1 122
18.1	203	18.3	205	18.4	207	18.6	209	18.7	210	18.9	212	19.1	214	19.2	216	19.4	218	1 123
18.3	205	18.4	207	18.6	209	18.7	210	18.9	212	19.0	214	19.2	216	19.4	218	19.5	219	1 124
18.4	207	18.5	209	18.7	210	18.9	212	19.0	214	19.2	216	19.3	217	19.5	219	19.7	221	1 125
18.5	209	18.7	210	18.8	212	19.0	214	19.1	216	19.3	217	19.5	219	19.6	221	19.8	223	1 126
18.7	210	18.8	212	19.0	214	19.1	215	19.3	217	19.4	219	19.6	221	19.8	223	19.9	225	1 127
18.8	212	18.9	214	19.1	216	19.3	217	19.4	219	19.6	221	19.7	223	19.9	224	20.1	226	1 128
18.9	214	19.1	215	19.2	217	19.4	219	19.6	221	19.7	223	19.9	224	20.0	226	20.2	228	1 129
19.1	215	19.2	217	19.4	219	19.5	221	19.7	222	19.8	224	20.0	226	20.2	228	20.3	230	1 130
19.2	217	19.3	219	19.5	221	19.7	222	19.8	224	20.0	226	20.1	228	20.3	230	20.5	232	1 131
19.3	219	19.5	221	19.6	222	19.8	224	20.0	226	20.1	228	20.3	230	20.4	231	20.6	233	1 132
19.5	220	19.6	222	19.8	224	19.9	226	20.1	228	20.3	229	20.4	231	20.6	233	20.7	235	1 133
19.6	222	19.7	224	19.9	226	20.1	228	20.2	229	20.4	231	20.6	233	20.7	235	20.9	237	1 134
19.7	224	19.9	226	20.0	227	20.2	229	20.4	231	20.5	233	20.7	235	20.9	237	21.0	239	1 135
19.9	226	20.0	227	20.2	229	20.3	231	20.5	233	20.7	235	20.8	237	21.0	238	21.1	240	1 136
20.0	227	20.1	229	20.3	231	20.5	233	20.6	234	20.8	236	21.0	238	21.1	240	21.3	242	1 137
20.1	229	20.3	231	20.4	233	20.6	234	20.8	236	20.9	238	21.1	240	21.3	242	21.4	244	1 138
20.3	231	20.4	232	20.6	234	20.7	236	20.9	238	21.0	240	21.2	242	21.4	244	21.5	245	1 139
20.4	232	20.5	234	20.7	236	20.9	238	21.0	240	21.2	242	21.4	244	21.5	245	21.7	247	1 140

Table 1 — Density-composition table for aqueous solutions of sulphuric acid

D_t is the density (mass per unit volume) of solution (in kg/m³) at a temperature t (in °C) [for many purposes it can be assumed that irrespective of the value of t the reading of a BS density hydrometer at t gives the density D_t , and that the reading of a 60/60 °F relative density hydrometer at t is numerically 0.001 greater than $D_{t/1000}$ (see Appendix A)].

g is the mass (in g) of H₂SO₄ in 100 g mass of solution.

G is the mass (in g) of H₂SO₄ in a quantity of solution occupying 1 L at the temperature stated at the head of the column.

t	10 °C		12 °C		14 °C		16 °C		18 °C		20 °C		22 °C	
D_t	g	G	g	G	g	G	g	G	g	G	g	G	g	G
1 141	19.4	222	19.6	224	19.7	225	19.9	227	20.1	229	20.2	231	20.4	232
1 142	19.6	223	19.7	225	19.9	227	20.0	229	20.2	230	20.3	232	20.5	234
1 143	19.7	225	19.8	227	20.0	229	20.2	230	20.3	232	20.5	234	20.6	236
1 144	19.8	227	20.0	228	20.1	230	20.3	232	20.4	234	20.6	236	20.8	237
1 145	20.0	229	20.1	230	20.3	232	20.4	234	20.6	236	20.7	237	20.9	239
1 146	20.1	230	20.2	232	20.4	234	20.5	236	20.7	237	20.9	239	21.0	241
1 147	20.2	232	20.4	234	20.5	235	20.7	237	20.8	239	21.0	241	21.1	242
1 148	20.3	234	20.5	235	20.6	237	20.8	239	21.0	241	21.1	242	21.3	244
1 149	20.5	235	20.6	237	20.8	239	20.9	240	21.1	242	21.2	244	21.4	246
1 150	20.6	237	20.8	239	20.9	240	21.1	242	21.2	244	21.4	246	21.5	248
1 151	20.7	239	20.9	240	21.0	242	21.2	244	21.3	246	21.5	247	21.7	249
1 152	20.9	240	21.0	242	21.2	244	21.3	246	21.5	247	21.6	249	21.8	251
1 153	21.0	242	21.1	244	21.3	245	21.5	247	21.6	249	21.8	251	21.9	253
1 154	21.1	244	21.3	245	21.4	247	21.6	249	21.7	251	21.9	253	22.1	254
1 155	21.2	245	21.4	247	21.6	249	21.7	251	21.9	253	22.0	254	22.2	256
1 156	21.4	247	21.5	249	21.7	251	21.8	252	22.0	254	22.2	256	22.3	258
1 157	21.5	249	21.7	250	21.8	252	22.0	254	22.1	256	22.3	258	22.4	260
1 158	21.6	250	21.8	252	21.9	254	22.1	256	22.3	258	22.4	260	22.6	261
1 159	21.8	252	21.9	254	22.1	256	22.2	258	22.4	259	22.5	261	22.7	263
1 160	21.9	254	22.0	256	22.2	257	22.4	259	22.5	261	22.7	263	22.8	265
1 161	22.0	256	22.2	257	22.3	259	22.5	261	22.6	263	22.8	265	23.0	267
1 162	22.1	257	22.3	259	22.5	261	22.6	263	22.8	265	22.9	266	23.1	268
1 163	22.3	259	22.4	261	22.6	263	22.7	264	22.9	266	23.1	268	23.2	270
1 164	22.4	261	22.6	262	22.7	264	22.9	266	23.0	268	23.2	270	23.3	272
1 165	22.5	262	22.7	264	22.8	266	23.0	268	23.2	270	23.3	272	23.5	274
1 166	22.6	264	22.8	266	23.0	268	23.1	270	23.3	271	23.4	273	23.6	275
1 167	22.8	266	22.9	268	23.1	269	23.2	271	23.4	273	23.6	275	23.7	277
1 168	22.9	267	23.1	269	23.2	271	23.4	273	23.5	275	23.7	277	23.9	279
1 169	23.0	269	23.2	271	23.3	273	23.5	275	23.7	277	23.8	278	24.0	280
1 170	23.2	271	23.3	273	23.5	275	23.6	276	23.8	278	23.9	280	24.1	282
1 171	23.3	273	23.4	274	23.6	276	23.8	278	23.9	280	24.1	282	24.2	284
1 172	23.4	274	23.6	276	23.7	278	23.9	280	24.0	282	24.2	284	24.4	286
1 173	23.5	276	23.7	278	23.8	280	24.0	282	24.2	283	24.3	285	24.5	287
1 174	23.7	278	23.8	280	24.0	282	24.1	283	24.3	285	24.5	287	24.6	289
1 175	23.8	279	23.9	281	24.1	283	24.3	285	24.4	287	24.6	289	24.7	291
1 176	23.9	281	24.1	283	24.2	285	24.4	287	24.5	289	24.7	291	24.9	292

Table 1 — Density-composition table for aqueous solutions of sulphuric acid

D_t is the density (mass per unit volume) of solution (in kg/m³) at a temperature t (in °C) [for many purposes it can be assumed that irrespective of the value of t the reading of a BS density hydrometer at t gives the density D_{15} , and that the reading of a 60/60 °F relative density hydrometer at t is numerically 0.001 greater than $D_{15/1000}$ (see Appendix A)].

g is the mass (in g) of H₂SO₄ in 100 g mass of solution.

G is the mass (in g) of H₂SO₄ in a quantity of solution occupying 1 L at the temperature stated at the head of the column.

24 °C		26 °C		28 °C		30 °C		32 °C		34 °C		36 °C		38 °C		40 °C		t
g	G	g	G	g	G	g	G	g	G	g	G	g	G	g	G	g	G	D_t
20.5	234	20.7	236	20.8	238	21.0	240	21.2	241	21.3	243	21.5	245	21.7	247	21.8	249	1 141
20.7	236	20.8	238	21.0	239	21.1	241	21.3	243	21.5	245	21.6	247	21.8	249	21.9	251	1 142
20.8	238	20.9	239	21.1	241	21.3	243	21.4	245	21.6	247	21.8	249	21.9	251	22.1	252	1 143
20.9	239	21.1	241	21.2	243	21.4	245	21.6	247	21.7	248	21.9	250	22.1	252	22.2	254	1 144
21.0	241	21.2	243	21.4	245	21.5	247	21.7	248	21.9	250	22.0	252	22.2	254	22.3	256	1 145
21.2	243	21.3	244	21.5	246	21.7	248	21.8	250	22.0	252	22.1	254	22.3	256	22.5	258	1 146
21.3	244	21.5	246	21.6	248	21.8	250	22.0	252	22.1	254	22.3	256	22.4	257	22.6	259	1 147
21.4	246	21.6	248	21.8	250	21.9	252	22.1	253	22.2	255	22.4	257	22.6	259	22.7	261	1 148
21.6	248	21.7	250	21.9	252	22.1	253	22.2	255	22.4	257	22.5	259	22.7	261	22.9	263	1 149
21.7	249	21.9	251	22.0	253	22.2	255	22.3	257	22.5	259	22.7	261	22.8	263	23.0	265	1 150
21.8	251	22.0	253	22.2	255	22.3	257	22.5	259	22.6	261	22.8	262	23.0	264	23.1	266	1 151
22.0	253	22.1	255	22.3	257	22.4	259	22.6	260	22.8	262	22.9	264	23.1	266	23.3	268	1 152
22.1	255	22.2	257	22.4	258	22.6	260	22.7	262	22.9	264	23.1	266	23.2	268	23.4	270	1 153
22.2	256	22.4	258	22.5	260	22.7	262	22.9	264	23.0	266	23.2	268	23.4	270	23.5	272	1 154
22.4	258	22.5	260	22.6	262	22.8	264	23.0	266	23.2	267	23.3	269	23.5	271	23.7	273	1 155
22.5	260	22.6	262	22.8	263	23.0	265	23.1	267	23.3	269	23.5	271	23.6	273	23.8	275	1 156
22.6	262	22.8	263	22.9	265	23.1	267	23.3	269	23.4	271	23.6	273	23.8	275	23.9	277	1 157
22.7	263	22.9	265	23.1	267	23.2	269	23.4	271	23.6	273	23.7	275	23.9	277	24.1	278	1 158
22.9	265	23.0	267	23.2	269	23.4	271	23.5	272	23.7	274	23.9	277	24.0	278	24.2	280	1 159
23.0	267	23.2	269	23.3	270	23.5	272	23.6	274	23.8	276	23.9	278	24.1	280	24.3	282	1 160
23.1	268	23.3	270	23.4	272	23.6	274	23.8	276	23.9	278	24.1	280	24.3	282	24.4	284	1 161
23.3	270	23.4	272	23.6	274	23.7	276	23.9	278	24.1	280	24.2	282	24.4	284	24.6	286	1 162
23.4	272	23.5	274	23.7	276	23.9	278	24.0	280	24.2	281	24.4	283	24.5	285	24.7	287	1 163
23.5	274	23.7	276	23.8	277	24.0	279	24.2	281	24.3	283	24.5	285	24.7	287	24.8	289	1 164
23.6	275	23.8	277	24.0	279	24.1	281	24.3	283	24.5	285	24.6	287	24.8	289	25.0	291	1 165
23.8	277	23.9	279	24.1	281	24.3	283	24.4	285	24.6	287	24.8	289	24.9	291	25.1	293	1 166
23.9	279	24.1	281	24.2	283	24.4	285	24.6	286	24.7	288	24.9	290	25.1	292	25.2	294	1 167
24.0	281	24.2	283	24.3	284	24.5	286	24.7	288	24.8	290	25.0	292	25.2	294	25.4	296	1 168
24.2	282	24.3	284	24.5	286	24.6	288	24.8	290	25.0	292	25.1	294	25.3	296	25.5	298	1 169
24.3	284	24.4	286	24.6	288	24.8	290	24.9	292	25.1	294	25.3	296	25.4	298	25.6	300	1 170
24.4	286	24.6	288	24.7	290	24.9	292	25.1	293	25.2	295	25.4	297	25.6	299	25.7	301	1 171
24.5	287	24.7	289	24.9	291	25.0	293	25.2	295	25.4	297	25.5	299	25.7	301	25.9	303	1 172
24.7	289	24.8	291	25.0	293	25.2	295	25.3	297	25.5	299	25.7	301	25.8	303	26.0	305	1 173
24.8	291	25.0	293	25.1	295	25.3	297	25.4	299	25.6	301	25.8	303	26.0	305	26.1	307	1 174
24.9	293	25.1	295	25.2	297	25.4	299	25.5	300	25.7	302	25.9	305	26.1	307	26.3	309	1 175
25.0	294	25.2	296	25.4	298	25.5	300	25.7	302	25.9	304	26.1	306	26.2	308	26.4	310	1 176

Table 1 — Density-composition table for aqueous solutions of sulphuric acid

D_t is the density (mass per unit volume) of solution (in kg/m³) at a temperature t [in °C] (for many purposes it can be assumed that irrespective of the value of t the reading of a BS density hydrometer at t gives the density D_t , and that the reading of a 60/60 °F relative density hydrometer at t is numerically 0.001 greater than $D_{t/1000}$ (see Appendix A)).

g is the mass (in g) of H₂SO₄ in 100 g mass of solution.

G is the mass (in g) of H₂SO₄ in a quantity of solution occupying 1 L at the temperature stated at the head of the column.

t	10 °C		12 °C		14 °C		16 °C		18 °C		20 °C		22 °C	
D_t	g	G	g	G	g	G	g	G	g	G	g	G	g	G
1 177	24.0	283	24.2	285	24.4	287	24.5	288	24.7	290	24.8	292	25.0	294
1 178	24.1	284	24.3	286	24.5	288	24.6	290	24.8	292	25.0	294	25.1	296
1 179	24.3	286	24.4	288	24.6	290	24.8	292	24.9	294	25.1	296	25.3	298
1 180	24.4	288	24.6	290	24.7	292	24.9	294	25.1	296	25.2	297	25.4	299
1 181	24.5	290	24.7	292	24.9	293	25.0	295	25.2	297	25.3	299	25.5	301
1 182	24.6	291	24.8	293	25.0	295	25.1	297	25.3	299	25.5	301	25.6	303
1 183	24.8	293	24.9	295	25.1	297	25.3	299	25.4	301	25.6	303	25.8	305
1 184	24.9	295	25.1	297	25.2	299	25.4	301	25.6	303	25.7	305	25.9	307
1 185	25.0	297	25.2	298	25.4	300	25.5	302	25.7	304	25.8	306	26.0	308
1 186	25.1	298	25.3	300	25.5	302	25.6	304	25.8	306	26.0	308	26.1	310
1 187	25.3	300	25.4	302	25.6	304	25.8	306	25.9	308	26.1	310	26.3	312
1 188	25.4	302	25.6	304	25.7	306	25.9	308	26.1	310	26.2	312	26.4	314
1 189	25.5	303	25.7	305	25.9	307	26.0	309	26.2	311	26.4	313	26.5	315
1 190	25.6	305	25.8	307	26.0	309	26.1	311	26.3	313	26.5	315	26.6	317
1 191	25.8	307	25.9	309	26.1	310	26.3	313	26.4	315	26.6	317	26.8	319
1 192	25.9	309	26.0	311	26.2	313	26.4	314	26.6	317	26.7	319	26.9	321
1 193	26.0	310	26.2	312	26.3	314	26.5	316	26.7	318	26.9	320	27.0	322
1 194	26.1	312	26.3	314	26.5	316	26.6	318	26.8	320	27.0	322	27.1	324
1 195	26.3	314	26.4	316	26.6	318	26.8	320	26.9	322	27.1	324	27.3	326
1 196	26.4	316	26.5	317	26.7	319	26.9	321	27.1	324	27.2	326	27.4	328
1 197	26.5	317	26.7	319	26.8	321	27.0	323	27.2	325	27.3	327	27.5	329
1 198	26.6	319	26.8	321	27.0	323	27.1	325	27.3	327	27.5	329	27.6	331
1 199	26.8	321	26.9	323	27.1	325	27.3	327	27.4	329	27.6	331	27.8	333
1 200	26.9	323	27.0	324	27.2	327	27.4	329	27.6	331	27.8	333	27.9	335
1 201	27.0	324	27.2	326	27.3	328	27.5	330	27.7	332	27.8	334	28.0	336
1 202	27.1	326	27.3	328	27.5	330	27.6	332	27.8	334	28.0	336	28.1	338
1 203	27.2	328	27.4	330	27.6	332	27.8	334	27.9	336	28.1	338	28.3	340
1 204	27.4	330	27.5	332	27.7	334	27.9	336	28.0	338	28.2	340	28.4	342
1 205	27.5	331	27.7	333	27.8	335	28.0	337	28.2	339	28.3	341	28.5	343
1 206	27.6	333	27.8	335	28.0	337	28.1	339	28.3	341	28.5	343	28.6	345
1 207	27.8	335	27.9	337	28.1	339	28.2	341	28.4	343	28.6	345	28.8	347
1 208	27.9	336	28.0	338	28.2	341	28.4	343	28.5	345	28.7	347	28.9	349
1 209	28.0	338	28.2	340	28.3	342	28.5	344	28.7	346	28.8	349	29.0	351
1 210	28.1	340	28.3	342	28.4	344	28.6	346	28.8	348	29.0	350	29.1	352
1 211	28.2	342	28.4	344	28.6	346	28.7	348	28.9	350	29.1	352	29.2	354
1 212	28.4	344	28.5	346	28.7	348	28.9	350	29.0	352	29.2	354	29.4	356

Table 1 — Density-composition table for aqueous solutions of sulphuric acid

D_t is the density (mass per unit volume) of solution (in kg/m³) at a temperature t [in °C] (for many purposes it can be assumed that irrespective of the value of t the reading of a BS density hydrometer at t gives the density D_t , and that the reading of a 60/60 °F relative density hydrometer at t is numerically 0.001 greater than $D_{t/1000}$ (see Appendix A)).

g is the mass (in g) of H₂SO₄ in 100 g mass of solution.

G is the mass (in g) of H₂SO₄ in a quantity of solution occupying 1 L at the temperature stated at the head of the column.

24 °C		26 °C		28 °C		30 °C		32 °C		34 °C		36 °C		38 °C		40 °C		t
g	G	g	G	g	G	g	G	g	G	g	G	g	G	g	G	g	G	D_t
25.2	296	25.3	298	25.5	300	25.7	302	25.8	304	26.0	306	26.2	308	26.3	310	26.5	312	1 177
25.3	298	25.5	300	25.6	302	25.8	304	26.0	306	26.1	308	26.3	310	26.5	312	26.6	314	1 178
25.4	300	25.6	302	25.8	304	25.9	306	26.1	308	26.3	309	26.4	312	26.6	314	26.8	316	1 179
25.5	301	25.7	303	25.9	306	26.1	307	26.2	309	26.4	311	26.6	313	26.7	315	26.9	317	1 180
25.7	303	25.8	305	26.0	307	26.2	309	26.3	311	26.5	313	26.7	315	26.9	317	27.0	319	1 181
25.8	305	26.0	307	26.1	309	26.3	311	26.5	313	26.6	315	26.8	317	27.0	319	27.2	321	1 182
25.9	307	26.1	309	26.3	311	26.4	313	26.6	315	26.8	317	26.9	319	27.1	321	27.3	323	1 183
26.1	308	26.2	310	26.4	312	26.6	314	26.7	316	26.9	318	27.1	320	27.2	323	27.4	324	1 184
26.2	310	26.3	312	26.5	314	26.7	316	26.8	318	27.0	320	27.2	322	27.4	324	27.5	326	1 185
26.3	312	26.5	314	26.6	316	26.8	318	27.0	320	27.1	322	27.3	324	27.5	326	27.7	328	1 186
26.4	314	26.6	316	26.8	318	26.9	320	27.1	322	27.3	324	27.4	326	27.6	328	27.8	330	1 187
26.6	315	26.7	317	26.9	320	27.1	321	27.2	323	27.4	326	27.6	328	27.7	330	27.9	332	1 188
26.7	317	26.9	319	27.0	321	27.2	323	27.4	325	27.5	327	27.7	329	27.9	331	28.0	333	1 189
26.8	319	27.0	321	27.1	323	27.3	325	27.5	327	27.7	329	27.8	331	28.0	333	28.2	335	1 190
26.9	321	27.1	322	27.3	325	27.4	327	27.6	329	27.8	331	27.9	333	28.1	335	28.3	337	1 191
27.1	322	27.2	324	27.4	326	27.6	329	27.7	331	27.9	333	28.1	335	28.2	337	28.4	339	1 192
27.2	324	27.4	326	27.5	328	27.7	330	27.9	332	28.0	334	28.2	336	28.4	338	28.5	340	1 193
27.3	326	27.5	328	27.6	330	27.8	332	28.0	334	28.2	336	28.3	338	28.5	340	28.7	342	1 194
27.4	328	27.6	330	27.8	332	27.9	334	28.1	336	28.3	338	28.4	340	28.6	342	28.8	344	1 195
27.5	329	27.7	332	27.9	334	28.1	336	28.2	338	28.4	340	28.6	342	28.7	344	28.9	346	1 196
27.7	331	27.9	333	28.0	335	28.2	337	28.4	339	28.5	342	28.7	344	28.9	346	29.1	348	1 197
27.8	333	28.0	335	28.1	337	28.3	339	28.5	341	28.7	343	28.8	345	29.0	347	29.2	350	1 198
27.9	335	28.1	337	28.3	339	28.4	341	28.6	344	28.8	345	29.0	347	29.1	349	29.3	351	1 199
28.0	337	28.2	339	28.4	341	28.6	343	28.7	345	28.9	347	29.1	349	29.2	351	29.4	353	1 200
28.2	338	28.4	340	28.5	342	28.7	345	28.9	347	29.0	349	29.2	351	29.4	353	29.6	355	1 201
28.3	340	28.5	342	28.6	344	28.8	346	29.0	348	29.2	351	29.3	353	29.5	355	29.7	357	1 202
28.4	342	28.6	344	28.8	346	28.9	348	29.1	350	29.3	352	29.5	354	29.6	356	29.8	358	1 203
28.6	344	28.7	346	28.9	348	29.1	350	29.2	352	29.4	354	29.6	356	29.8	358	29.9	360	1 204
28.7	345	28.9	348	29.0	350	29.2	352	29.4	354	29.5	356	29.7	358	29.9	360	30.1	362	1 205
28.8	347	29.0	349	29.1	351	29.3	353	29.5	356	29.7	358	29.8	360	30.0	362	30.2	364	1 206
28.9	349	29.1	351	29.3	353	29.4	355	29.6	357	29.8	359	30.0	361	30.1	363	30.3	366	1 207
29.1	351	29.2	353	29.4	355	29.6	357	29.7	359	29.9	361	30.1	363	30.3	365	30.4	367	1 208
29.2	353	29.3	355	29.5	357	29.7	359	29.9	361	30.0	363	30.2	365	30.4	367	30.6	369	1 209
29.3	355	29.5	357	29.6	359	29.8	361	30.0	363	30.2	365	30.3	367	30.5	369	30.7	371	1 210
29.4	356	29.6	358	29.8	360	29.9	363	30.1	365	30.3	367	30.4	369	30.6	371	30.8	373	1 211
29.5	358	29.7	360	29.9	362	30.1	364	30.2	366	30.4	368	30.6	371	30.8	373	30.9	375	1 212

Table 1 — Density-composition table for aqueous solutions of sulphuric acid

D_t is the density (mass per unit volume) of solution (in kg/m³) at a temperature t (in °C) [for many purposes it can be assumed that irrespective of the value of t the reading of a BS density hydrometer at t gives the density D_t , and that the reading of a 60/60 °F relative density hydrometer at t is numerically 0.001 greater than $D_{t/1000}$ (see Appendix A)].

g is the mass (in g) of H₂SO₄ in 100 g mass of solution.

G is the mass (in g) of H₂SO₄ in a quantity of solution occupying 1 L at the temperature stated at the head of the column.

t	10 °C		12 °C		14 °C		16 °C		18 °C		20 °C		22 °C	
D_t	g	G	g	G	g	G	g	G	g	G	g	G	g	G
1 213	28.5	345	28.6	348	28.8	349	29.0	352	29.1	354	29.3	356	29.5	358
1 214	28.6	347	28.8	349	28.9	351	29.1	353	29.3	355	29.4	358	29.6	360
1 215	28.7	349	28.9	351	29.1	353	29.2	355	29.4	357	29.6	359	29.7	361
1 216	28.8	351	29.0	353	29.2	355	29.4	357	29.5	359	29.7	361	29.9	363
1 217	29.0	352	29.1	355	29.3	357	29.5	359	29.6	361	29.8	363	30.0	365
1 218	29.1	354	29.3	356	29.4	358	29.6	361	29.8	362	29.9	365	30.1	367
1 219	29.2	356	29.4	358	29.6	360	29.7	362	29.9	364	30.1	366	30.2	369
1 220	29.3	358	29.5	360	29.7	362	29.8	364	30.0	366	30.2	368	30.4	370
1 221	29.5	360	29.6	362	29.8	364	30.0	366	30.1	368	30.3	370	30.5	372
1 222	29.6	361	29.7	363	29.9	366	30.1	368	30.3	370	30.4	372	30.6	374
1 223	29.7	363	29.9	365	30.0	367	30.2	369	30.4	372	30.6	374	30.7	376
1 224	29.8	365	30.0	367	30.2	369	30.3	371	30.5	373	30.7	375	30.8	377
1 225	29.9	361	30.1	369	30.3	371	30.5	373	30.6	375	30.8	377	31.0	379
1 226	30.1	369	30.2	371	30.4	373	30.6	375	30.7	377	30.9	379	31.1	381
1 227	30.2	370	30.4	372	30.5	374	30.7	377	30.9	379	31.0	381	31.2	383
1 228	30.3	372	30.5	374	30.7	376	30.8	378	31.0	381	31.2	383	31.3	385
1 229	30.4	374	30.6	376	30.8	378	30.9	380	31.1	382	31.3	384	31.5	387
1 230	30.5	376	30.7	378	30.9	380	31.1	382	31.2	384	31.4	386	31.6	388
1 231	30.7	377	30.8	380	31.0	382	31.2	384	31.4	386	31.5	388	31.7	390
1 232	30.8	379	31.0	381	31.1	384	31.3	386	31.5	388	31.7	390	31.8	392
1 233	30.9	381	31.1	383	31.3	385	31.4	387	31.6	390	31.8	392	31.9	394
1 234	31.0	383	31.2	385	31.4	387	31.5	389	31.7	391	31.9	394	32.1	396
1 235	31.1	385	31.3	387	31.5	389	31.7	391	31.8	393	32.0	395	32.2	397
1 236	31.3	386	31.4	388	31.6	391	31.8	393	32.0	395	32.1	397	32.3	399
1 237	31.4	388	31.6	390	31.7	393	31.9	395	32.1	397	32.3	399	32.4	401
1 238	31.5	390	31.7	392	31.9	394	32.0	396	32.2	399	32.4	401	32.5	403
1 239	31.6	392	31.8	394	32.0	396	32.1	398	32.3	400	32.5	403	32.7	405
1 240	31.7	394	31.9	396	32.1	398	32.3	400	32.4	402	32.6	404	32.8	406
1 241	31.9	396	32.0	398	32.2	400	32.4	402	32.6	404	32.7	406	32.9	408
1 242	32.0	397	32.2	399	32.3	402	32.5	404	32.7	406	32.9	408	33.0	410
1 243	32.1	399	32.3	401	32.5	403	32.6	406	32.8	408	33.0	410	33.1	412
1 244	32.2	401	32.4	403	32.6	405	32.8	407	32.9	410	33.1	412	33.3	414
1 245	32.4	403	32.5	405	32.7	407	32.9	409	33.0	411	33.2	414	33.4	416
1 246	32.5	404	32.6	406	32.8	409	33.0	411	33.2	413	33.3	415	33.5	417
1 247	32.6	406	32.8	409	32.9	411	33.1	413	33.3	415	33.4	417	33.6	419
1 248	32.7	408	32.9	410	33.1	413	33.2	415	33.4	417	33.6	419	33.8	421