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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION
R 336

PLAIN END STEEL TUBES, WELDED OR SEAMLESS
GENERAL TABLE OF DIMENSIONS AND MASSES PER UNIT LENGTH

1st EDITION
September 1963

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

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BRIEF HISTORY

The ISO Recommendation R 336, *Plain End Steel Tubes, Welded or Seamless – General Table of Dimensions and Masses per Unit Length*, was drawn up by Technical Committee ISO/TC 5, *Pipes and Fittings*, the Secretariat of which is held by the Association Suisse de Normalisation (SNV).

Work on this question by the Technical Committee began in 1957 and led, in 1961, to the adoption of a Draft ISO Recommendation.

In August 1961, this Draft ISO Recommendation (No. 461) was circulated to all the ISO Member Bodies for enquiry. It was approved, subject to a few modifications of an editorial nature, by the following Member Bodies:

Australia	France	New Zealand
Belgium	Germany	Norway
Brazil	Greece	Spain
Burma	Hungary	Sweden
Czechoslovakia	India	Switzerland
Chile	Israel	United Kingdom
Denmark	Italy	Yugoslavia
Finland	Netherlands	

One Member Body opposed the approval of the Draft: U.S.S.R.

The Draft ISO Recommendation was then submitted by correspondence to the ISO Council, which decided, in September 1963, to accept it as an ISO RECOMMENDATION.

ISO Recommendation R 336 September 1963

PLAIN END STEEL TUBES, WELDED OR SEAMLESS

GENERAL TABLE OF DIMENSIONS AND MASSES PER UNIT LENGTH *

1. SCOPE

This ISO Recommendation should be considered as a basic document for the preparation of specific ISO Recommendations. The diameters, thicknesses and masses per unit length for appropriate specifications (for example: for pipes and tubes for boilers, structural and mechanical purposes, pipe lines, etc.) should be selected from this general table.

2. INTRODUCTION

The attached table gives the masses of plain end tubes in kilogrammes per metre and pounds per foot, calculated in accordance with the method agreed already for ISO Recommendation R 65, *Steel Tubes suitable for Screwing in accordance with ISO Recommendation R 7*. An explanation of the method of calculation is given below. The corresponding diameters in millimetres and inches are in accordance with ISO Recommendation R 64, *Steel Tubes — Outside Diameters*. The corresponding thicknesses in millimetres and inches are in accordance with ISO Recommendation R 221, *Steel Tubes — Thicknesses*.

The main purpose of this table is to serve as a ready reckoner and to avoid the possibility of different countries putting forward different masses for a tube of the same nominal dimension. The inclusion of a mass for a given size of tube in this table, therefore, does not necessarily mean that such size is available, although at some future date it may be.

Should the mass of a thinner or a thicker tube be required, it can be calculated by the method given below.

This table does not apply to tubes primarily intended to be screwed in accordance with ISO Recommendation R 7, *Pipe Threads for Gas List Tubes and Screwed Fittings where Pressure-Tight Joints are made on the Threads (1/8 Inch to 6 Inches)*. The masses of such tubes, both screwed and plain end, are given in ISO Recommendation R 65.

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* See also ISO Recommendation R 64, *Steel Tubes — Outside Diameters*, and ISO Recommendation R 221, *Steel Tubes — Thicknesses*.

3. METHOD OF CALCULATION

The values to at least five significant figures have been calculated by the formulae given below:

for the metric system $m = (D-t) \cdot t \cdot 0.024\ 661\ 5$* kg/m . . . (A)

for the inch system $m = (D-t) \cdot t \cdot 10.681\ 42$** lb/ft . . . (B)

where

m = mass,
D = specified outside diameter,
t = specified thickness.

The lb/ft value (B) is then converted to kg/m value (C) by multiplying it by 1.4882.

The mean value in kg/m (D) $= \dfrac{(A) + (C)}{2}$

If this value does not differ by more than 1.5 per cent from either (A) or (C), the tube dimensions are considered to be "corresponding" *** and the value (D) is the agreed value for tubes of the dimensions concerned, whether these dimensions be metric or inch. The mean value in kg/m (D) is rounded to three significant figures.

The equivalent mean lb/ft value (E) is found by dividing the rounded value (D) by 1.4882. This value (E) is then rounded to three significant figures.

The values given in the table are those of (D) and (E). If value (D) differs by more than 1.5 per cent from either (A) or (C), the tubes are shown in separate columns.

* This coefficient takes into account a density equal to 7.85 kg/dm³.

** This coefficient takes into account a density equal to 489.6 lb/ft³.

*** The dimensions in millimetres and in inches, given in the tables, are considered to be "corresponding values", although some of them are not exact equivalents. In all cases, however, the dimensions ensure practical interchangeability.

Outside diameter														
		mm in	**0.5** **0.020**	**0.6** **0.024**	**0.8** **0.032**	**1.0** **0.040**	**1.2** **0.048**	**1.4** **0.056**	**1.6** **0.064**	**1.8** **0.072**	**2.0** **0.080**	**2.3** **0.092**	**2.6** **0.104**	**2.9** **0.116**	**3.2** **0.128**
mm	in														
10.2	$^{13}/_{32}$	kg/m lb/ft	0.121 0.081 3	0.144 0.096 8	0.188 0.126	0.230 0.155	0.270 0.181	0.308 0.207	0.344 0.231	0.378 0.254	0.410 0.276	0.454 0.305	0.493 0.331		
12	$^{15}/_{32}$	kg/m lb/ft	0.142 0.095 4	0.169 0.114	0.222 0.149	0.272 0.183	0.320 0.215	0.367 0.247	0.411 0.276	0.453 0.304	0.494 0.332	0.551 0.370	0.603 0.405	0.651 0.437	0.694 0.466
13.5	$^{17}/_{32}$	kg/m lb/ft	0.161 0.108	0.192 0.129	0.252 0.169	0.310 0.208	0.366 0.246	0.420 0.282	0.472 0.317	0.522 0.351	0.571 0.384	0.639 0.429	0.703 0.472	0.762 0.512	0.817 0.549
16	$^{5}/_{8}$	kg/m lb/ft	0.192 0.129	0.229 0.154	0.301 0.202	0.371 0.249	0.439 0.295	0.505 0.339	0.569 0.382	0.632 0.425	0.692 0.465	0.778 0.523	0.860 0.578	0.938 0.630	1.01 0.679
17.2	* $^{11}/_{16}$	kg/m lb/ft	0.207 0.139	0.247 0.166	0.326 0.219	0.402 0.270	0.477 0.321	0.549 0.369	0.620 0.417	0.688 0.462	0.754 0.507	0.850 0.571	0.942 0.633	1.03 0.692	1.11 0.746
19	$^{3}/_{4}$	kg/m lb/ft	0.230 0.155	0.275 0.185	0.362 0.243	0.448 0.301	0.531 0.357	0.613 0.412	0.692 0.465	0.770 0.517	0.845 0.568	0.955 0.642	1.06 0.712	1.16 0.779	1.26 0.847
20	$^{25}/_{32}$	kg/m lb/ft	0.241 0.162	0.288 0.194	0.380 0.255	0.470 0.316	0.558 0.375	0.644 0.433	0.728 0.489	0.810 0.544	0.890 0.598	1.01 0.679	1.12 0.753	1.22 0.820	1.33 0.894
21.3	$^{27}/_{32}$	kg/m lb/ft	0.259 0.174	0.310 0.208	0.409 0.275	0.506 0.340	0.601 0.404	0.694 0.466	0.785 0.527	0.874 0.587	0.962 0.646	1.09 0.732	1.21 0.813	1.33 0.894	1.44 0.968
25	—	kg/m	0.302	0.361	0.477	0.592	0.704	0.815	0.923	1.03	1.13	1.29	1.44	1.58	1.72
25.4	**1**	kg/m lb/ft	0.309 0.208	0.370 0.249	0.489 0.329	0.606 0.407	0.721 0.484	0.834 0.560	0.946 0.636	1.05 0.706	1.16 0.779	1.32 0.887	1.47 0.988	1.62 1.09	1.76 1.18
26.9	**1** $^{1}/_{16}$	kg/m lb/ft	0.328 0.220	0.393 0.264	0.520 0.349	0.644 0.433	0.767 0.515	0.888 0.597	1.01 0.679	1.12 0.753	1.24 0.833	1.41 0.947	1.57 1.05	1.73 1.16	1.89 1.27
30	**1** $^{3}/_{16}$	kg/m lb/ft	0.367 0.247	0.439 0.295	0.582 0.391	0.722 0.485	0.861 0.579	0.997 0.670	1.13 0.759	1.26 0.847	1.39 0.934	1.59 1.07	1.77 1.19	1.96 1.32	2.14 1.44
31.8	**1** $^{1}/_{4}$	kg/m lb/ft	0.388 0.261	0.465 0.312	0.616 0.414	0.764 0.513	0.911 0.612	1.06 0.712	1.20 0.806	1.34 0.900	1.48 0.994	1.68 1.13	1.88 1.26	2.08 1.40	2.27 1.53
33.7	** **1** $^{11}/_{32}$	kg/m lb/ft	0.412 0.277	0.493 0.331	0.654 0.439	0.812 0.546	0.969 0.651	1.12 0.753	1.28 0.860	1.43 0.961	1.57 1.05	1.79 1.20	2.01 1.35	2.22 1.49	2.42 1.63
38	**1** $^{1}/_{2}$	kg/m lb/ft	0.466 0.313	0.558 0.375	0.740 0.497	0.920 0.618	1.10 0.739	1.27 0.853	1.45 0.974	1.62 1.09	1.79 1.20	2.04 1.37	2.29 1.54	2.53 1.70	2.77 1.86
42.4	*** **1** $^{11}/_{16}$	kg/m lb/ft	0.520 0.349	0.623 0.419	0.827 0.556	1.03 0.692	1.23 0.827	1.43 0.961	1.62 1.09	1.82 1.22	2.01 1.35	2.29 1.54	2.57 1.73	2.84 1.91	3.11 2.09
44.5	**1** $^{3}/_{4}$	kg/m lb/ft	0.546 0.367	0.654 0.439	0.868 0.583	1.08 0.726	1.29 0.867	1.50 1.01	1.70 1.14	1.91 1.28	2.11 1.42	2.41 1.62	2.70 1.81	2.99 2.01	3.28 2.20
48.3	**1** $^{29}/_{32}$	kg/m lb/ft	0.595 0.400	0.712 0.478	0.945 0.635	1.18 0.793	1.41 0.947	1.63 1.10	1.86 1.25	2.08 1.40	2.30 1.55	2.63 1.77	2.95 1.98	3.27 2.20	3.59 2.41
51	**2**	kg/m lb/ft	0.626 0.421	0.750 0.504	0.996 0.669	1.24 0.833	1.48 0.994	1.72 1.16	1.96 1.32	2.20 1.48	2.43 1.63	2.78 1.87	3.12 2.10	3.46 2.32	3.79 2.55
54	**2** $^{1}/_{8}$	kg/m lb/ft	0.664 0.446	0.796 0.535	1.06 0.712	1.32 0.887	1.57 1.05	1.83 1.23	2.08 1.40	2.33 1.57	2.58 1.73	2.95 1.98	3.32 2.23	3.68 2.47	4.04 2.71
57	**2** $^{1}/_{4}$	kg/m lb/ft	0.703 0.472	0.842 0.566	1.12 0.753	1.39 0.934	1.67 1.12	1.94 1.30	2.20 1.48	2.47 1.66	2.74 1.84	3.13 2.10	3.52 2.37	3.90 2.62	4.28 2.88
60.3	**2** $^{3}/_{8}$	kg/m lb/ft	0.743 0.499	0.890 0.598	1.18 0.793	1.47 0.988	1.76 1.18	2.05 1.38	2.33 1.57	2.62 1.76	2.90 1.95	3.31 2.22	3.73 2.51	4.14 2.78	4.54 3.05
63.5	**2** $^{1}/_{2}$	kg/m lb/ft	0.783 0.526	0.938 0.630	1.25 0.840	1.55 1.04	1.86 1.25	2.16 1.45	2.46 1.65	2.76 1.85	3.06 2.06	3.50 2.35	3.93 2.64	4.36 2.93	4.79 3.22
70	**2** $^{3}/_{4}$	kg/m lb/ft	0.862 0.579	1.03 0.692	1.37 0.921	1.71 1.15	2.05 1.38	2.38 1.60	2.72 1.83	3.05 2.05	3.37 2.26	3.86 2.59	4.35 2.92	4.83 3.25	5.30 3.56
73	**2** $^{7}/_{8}$	kg/m lb/ft	0.901 0.605	1.08 0.726	1.44 0.968	1.79 1.20	2.14 1.44	2.49 1.67	2.84 1.91	3.18 2.14	3.53 2.37	4.04 2.71	4.55 3.06	5.05 3.39	5.55 3.73
76.1	**3**	kg/m lb/ft	0.940 0.632	1.13 0.759	1.50 1.01	1.87 1.26	2.23 1.50	2.60 1.75	2.96 1.99	3.32 2.23	3.68 2.47	4.22 2.84	4.75 3.19	5.28 3.55	5.80 3.90
82.5	**3** $^{1}/_{4}$	kg/m lb/ft	1.02 0.685	1.22 0.820	1.62 1.09	2.03 1.36	2.42 1.63	2.82 1.89	3.22 2.16	3.61 2.43	4.00 2.69	4.58 3.08	5.16 3.47	5.74 3.86	6.31 4.24
88.9	**3** $^{1}/_{2}$	kg/m lb/ft	1.10 0.739	1.32 0.887	1.75 1.18	2.18 1.46	2.61 1.75	3.04 2.04	3.47 2.33	3.89 2.61	4.32 2.90	4.95 3.33	5.57 3.74	6.20 4.17	6.81 4.58
101.6	**4**	kg/m lb/ft	1.26 0.847	1.51 1.01	2.00 1.34	2.50 1.68	2.99 2.01	3.49 2.35	3.98 2.67	4.46 3.00	4.95 3.33	5.67 3.81	6.39 4.29	7.11 4.78	7.82 5.25
108	**4** $^{1}/_{4}$	kg/m lb/ft	1.34 0.900	1.60 1.08	2.13 1.43	2.66 1.79	3.18 2.14	3.71 2.49	4.23 2.84	4.75 3.19	5.27 3.54	6.04 4.06	6.81 4.58	7.57 5.09	8.33 5.60
114.3	**4** $^{1}/_{2}$	kg/m lb/ft	1.41 0.947	1.70 1.14	2.26 1.52	2.82 1.89	3.37 2.26	3.93 2.64	4.48 3.01	5.03 3.38	5.58 3.75	6.40 4.30	7.21 4.84	8.03 5.40	8.83 5.93

This table is also applicable to special steel tubes (for example stainless), in which case the masses per unit lengt

* Tolerance and masses based on 0.677 in.
** Tolerance and masses based on 1.327 in.
*** Tolerance and masses based on 1.669 in.

GENERAL TABLE OF DIMENSIONS AND MASSES PER UNIT LENGTH

Thickness														
3.2 **0.128**	**3.6** **0.144**	**4.0** **0.160**	**4.5** **0.176**	**—** **0.192**	**5.0** **—**	**5.4** **0.212**	**5.6** **7/32**	**5.9** **0.232**	**6.3** **1/4**	**7.1** **9/32**	**8.0** **5/16**	**8.8** **11/32**	**—** **3/8**	**10.0** **—**
Conventional mass per unit length														
0.694 0.466														
0.817 0.549	0.883 0.593													
1.01 0.679	1.10 0.739	1.18 0.793												
1.11 0.746	1.21 0.813	1.31 0.880	1.41 0.947											
1.26 0.847	1.38 0.927	1.49 1.00	1.61 1.08	1.14	1.73									
1.33 0.894	1.46 0.981	1.58 1.06	1.71 1.15	1.21	1.85									
1.44 0.968	1.59 1.07	1.72 1.16	1.87 1.26	1.34	2.01	2.12 1.42								
1.72	1.90	2.07	2.28		2.47	2.61	2.68	2.78	2.91					
1.76 1.18	1.95 1.31	2.12 1.42	2.31 1.55	1.66	2.52	2.66 1.79	2.73 1.83	2.83 1.90	2.97 2.00					
1.89 1.27	2.09 1.40	2.28 1.53	2.48 1.67	1.79	2.70	2.86 1.92	2.94 1.98	3.06 2.06	3.21 2.16	3.48 2.34				
2.14 1.44	2.37 1.59	2.59 1.74	2.83 1.90	2.04	3.08	3.28 2.20	3.37 2.26	3.52 2.37	3.70 2.49	4.03 2.71	4.34 2.92			
2.27 1.53	2.52 1.69	2.76 1.85	3.02 2.03	2.17	3.30	3.51 2.36	3.60 2.42	3.76 2.53	3.97 2.67	4.33 2.91	4.68 3.14			
2.42 1.63	2.69 1.81	2.95 1.98	3.23 2.17	2.33	3.54	3.76 2.53	3.87 2.60	4.04 2.71	4.27 2.87	4.67 3.14	5.05 3.39	5.39 3.62		
2.77 1.86	3.08 2.07	3.38 2.27	3.71 2.49	2.68	4.07	4.34 2.92	4.47 3.00	4.67 3.14	4.95 3.33	5.43 3.65	5.91 3.97	6.33 4.25	4.51	6.91
3.11 2.09	3.47 2.33	3.81 2.56	4.19 2.82	3.03	4.61	4.92 3.31	5.07 3.41	5.31 3.57	5.62 3.78	6.19 4.16	6.76 4.54	7.27 4.89	5.18	7.99
3.28 2.20	3.65 2.45	4.02 2.70	4.42 2.97	3.20	4.87	5.20 3.49	5.35 3.59	5.61 3.77	5.95 4.00	6.56 4.41	7.17 4.82	7.72 5.19	5.51	8.51
3.59 2.41	4.00 2.69	4.41 2.96	4.85 3.26	3.52	5.34	5.71 3.84	5.89 3.96	6.17 4.15	6.55 4.40	7.24 4.86	7.93 5.33	8.56 5.75	6.13	9.45
3.79 2.55	4.23 2.84	4.66 3.13	5.13 3.45	3.71	5.67	6.05 4.07	6.24 4.19	6.54 4.39	6.95 4.67	7.69 5.17	8.43 5.66	9.10 6.11	6.51	10.1
4.04 2.71	4.50 3.02	4.97 3.34	5.47 3.68	3.96	6.04	6.46 4.34	6.66 4.48	6.99 4.70	7.43 4.99	8.23 5.53	9.04 6.07	9.77 6.56	7.01	10.9
4.28 2.88	4.78 3.21	5.27 3.54	5.81 3.90	4.22	6.41	6.87 4.62	7.08 4.76	7.44 5.00	7.91 5.32	8.77 5.89	9.65 6.48	10.4 6.99	7.51	11.6
4.54 3.05	5.07 3.41	5.59 3.76	6.17 4.15	4.48	6.82	7.30 4.91	7.53 5.06	7.91 5.32	8.42 5.66	9.34 6.28	10.3 6.92	11.1 7.46	8.01	12.4
4.79 3.22	5.36 3.60	5.91 3.97	6.52 4.38	4.73	7.21	7.72 5.19	7.97 5.36	8.37 5.62	8.91 5.99	9.90 6.65	10.9 7.32	11.8 7.93	8.51	13.2
5.30 3.56	5.93 3.98	6.55 4.40	7.24 4.86	5.25	8.01	8.58 5.77	8.85 5.95	9.31 6.26	9.92 6.67	11.0 7.39	12.2 8.20	13.2 8.87	9.51	14.8
5.55 3.73	6.21 4.17	6.86 4.61	7.58 5.09	5.50	8.38	8.99 6.04	9.28 6.24	9.76 6.56	10.4 6.99	11.6 7.79	12.8 8.60	13.9 9.34	10.0	15.5
5.80 3.90	6.49 4.36	7.17 4.82	7.92 5.32	5.76	8.77	9.41 6.32	9.71 6.52	10.2 6.85	10.9 7.32	12.1 8.13	13.4 9.00	14.6 9.81	10.5	16.3
6.31 4.24	7.06 4.74	7.80 5.24	8.63 5.80	6.27	9.56	10.3 6.92	10.6 7.12	11.1 7.46	11.9 8.00	13.2 8.87	14.6 9.81	15.9 10.7	11.5	17.9
6.81 4.58	7.63 5.13	8.43 5.66	9.33 6.27	6.78	10.3	11.1 7.46	11.5 7.73	12.1 8.13	12.9 8.67	14.4 9.68	15.9 10.7	17.3 11.6	12.5	19.5
7.82 5.25	8.76 5.89	9.70 6.52	10.7 7.19	7.81	11.9	12.8 8.60	13.2 8.87	13.9 9.34	14.9 10.0	16.6 11.2	18.4 12.4	20.1 13.5	14.5	22.6
8.33 5.60	9.33 6.27	10.3 6.92	11.4 7.66	8.32	12.7	13.6 9.14	14.1 9.47	14.8 9.94	15.8 10.6	17.7 11.9	19.6 13.2	21.4 14.4	15.5	24.2
8.83 5.93	9.90 6.65	11.0 7.39	12.1 8.13	8.84	13.5	14.5 9.74	15.0 10.1	15.8 10.6	16.8 11.3	18.8 12.6	20.9 14.0	22.8 15.3	16.5	25.7

t length should be multiplied by appropriate coefficients.

10.0 —	11.0 7/16	12.5 1/2	14.2 9/16	16.0 5/8	17.5 11/16	— 3/4	20.0 —	— 13/16	22.2 7/8	— 15/16	25.0 1
6.91											
7.99	8.54 5.74										
8.51	9.11 6.12	9.90 6.65									
9.45	10.2 6.85	11.1 7.46									
10.1	10.9 7.32	11.9 8.00	12.9 8.67								
10.9	11.7 7.86	12.9 8.67	14.0 9.41								
11.6	12.5 8.40	13.8 9.27	15.0 10.1	16.2 10.9							
12.4	13.4 9.00	14.8 9.94	16.2 10.9	17.4 11.7							
13.2	14.3 9.61	15.8 10.6	17.3 11.6	18.7 12.6							
14.8	16.0 10.8	17.8 12.0	19.6 13.2	21.2 14.2	22.6 15.2						
15.5	16.9 11.4	18.8 12.6	20.6 13.8	22.4 15.1	23.9 16.1	17.0	26.1				
16.3	17.7 11.9	19.7 13.2	21.7 14.6	23.7 15.9	25.3 17.0	18.0	27.7				
17.9	19.5 13.1	21.7 14.6	24.0 16.1	26.2 17.6	28.0 18.8	20.0	30.8	21.2	33.0 22.2	23.2	
19.5	21.2 14.2	23.7 15.9	26.2 17.6	28.7 19.3	30.8 20.7	22.0	34.0	23.3	36.5 24.5	25.7	39.6 26.6
22.6	24.7 16.6	27.6 18.5	30.7 20.6	33.7 22.6	36.2 24.3	26.0	40.2	27.7	43.5 29.2	30.7	47.5 31.9
24.2	26.4 17.7	29.6 19.9	32.9 22.1	36.2 24.3	39.0 26.2	28.0	43.4	29.8	47.0 31.6	33.2	51.4 34.5
25.7	28.1 18.9	31.6 21.2	35.1 23.6	38.6 25.9	41.7 28.0	30.0	46.5	32.0	50.4 33.9	35.7	55.3 37.2

Outside diameter			mm	0.5	0.6	0.8	1.0	1.2	1.4	1.6	1.8	2.0	2.3	2.6
			in	0.020	0.024	0.032	0.040	0.048	0.056	0.064	0.072	0.080	0.092	0.104
mm	in													
127	5	kg/m			1.88	2.51	3.13	3.75	4.37	4.98	5.60	6.21	7.13	8.04
		lb/ft			1.26	1.69	2.10	2.52	2.94	3.35	3.76	4.17	4.79	5.40
133	5 1/4	kg/m			1.98	2.63	3.28	3.93	4.58	5.23	5.88	6.52	7.48	8.43
		lb/ft			1.33	1.77	2.20	2.64	3.08	3.51	3.95	4.38	5.03	5.66
139.7	5 1/2	kg/m			2.07	2.76	3.45	4.13	4.81	5.49	6.17	6.84	7.85	8.86
		lb/ft			1.39	1.85	2.32	2.78	3.23	3.69	4.15	4.60	5.27	5.95
141.3	5 9/16	kg/m			2.10	2.79	3.49	4.18	4.87	5.55	6.24	6.92	7.94	8.96
		lb/ft			1.41	1.87	2.35	2.81	3.27	3.73	4.19	4.65	5.34	6.02
152.4	6	kg/m				3.01	3.76	4.51	5.25	5.99	6.73	7.47	8.58	9.68
		lb/ft				2.02	2.53	3.03	3.53	4.02	4.52	5.02	5.77	6.50
159	6 1/4	kg/m				3.14	3.92	4.70	5.48	6.25	7.02	7.80	8.95	10.1
		lb/ft				2.11	2.63	3.16	3.68	4.20	4.72	5.24	6.01	6.79
165.1	6 1/2	kg/m				3.27	4.08	4.89	5.69	6.50	7.30	8.10	9.30	10.5
		lb/ft				2.20	2.74	3.29	3.82	4.37	4.91	5.44	6.25	7.06
168.3	6 5/8	kg/m				3.33	4.16	4.98	5.81	6.63	7.45	8.26	9.48	10.7
		lb/ft				2.24	2.80	3.35	3.90	4.46	5.01	5.55	6.37	7.19
177.8	7	kg/m				3.52	4.39	5.27	6.14	7.00	7.87	8.74	10.0	11.3
		lb/ft				2.37	2.95	3.54	4.13	4.70	5.29	5.87	6.72	7.59
193.7	7 5/8	kg/m				3.83	4.79	5.74	6.69	7.64	8.58	9.53	10.9	12.3
		lb/ft				2.57	3.22	3.86	4.50	5.13	5.84	6.40	7.32	8.27
219.1	8 5/8	kg/m				4.34	5.42	6.50	7.57	8.65	9.72	10.8	12.4	14.0
		lb/ft				2.92	3.64	4.37	5.09	5.81	6.53	7.26	8.33	9.41
244.5	9 5/8	kg/m				4.84	6.05	7.25	8.46	9.66	10.9	12.0	13.8	15.6
		lb/ft				3.25	4.07	4.87	5.68	6.49	7.32	8.06	9.27	10.5
267	10 1/2	kg/m					6.61	7.92	9.23	10.5	11.9	13.2	15.1	17.1
		lb/ft					4.44	5.32	6.20	7.06	8.00	8.87	10.1	11.5
273	10 3/4	kg/m					6.76	8.10	9.45	10.8	12.1	13.5	15.5	17.5
		lb/ft					4.54	5.44	6.35	7.26	8.13	9.07	10.4	11.8
298.5	11 3/4	kg/m						8.86	10.3	11.8	13.3	14.7	16.9	19.1
		lb/ft						5.95	6.92	7.93	8.94	9.88	11.4	12.8
323.9	12 3/4	kg/m							11.2	12.8	14.4	16.0	18.4	20.8
		lb/ft							7.53	8.60	9.68	10.8	12.4	14.0
355.6	14	kg/m							12.3	14.1	15.8	17.6	20.2	22.8
		lb/ft							8.27	9.47	10.6	11.8	13.6	15.3
368	14 1/2	kg/m							12.8	14.6	16.4	18.2	20.9	23.6
		lb/ft							8.60	9.81	11.0	12.2	14.0	15.9
406.4	16	kg/m									18.1	20.1	23.1	26.1
		lb/ft									12.2	13.5	15.5	17.5
419	16 1/2	kg/m									18.7	20.7	23.8	26.9
		lb/ft									12.6	13.9	16.0	18.1
457.2	18	kg/m									20.4	22.6	26.0	29.4
		lb/ft									13.7	15.2	17.5	19.8
508	20	kg/m										25.1	28.9	32.6
		lb/ft										16.9	19.4	21.9
558.8	22	kg/m											31.8	35.9
		lb/ft											21.4	24.1
609.6	24	kg/m												39.2
		lb/ft												26.3
660.4	26	kg/m												42.5
		lb/ft												28.6
711.2	28	kg/m												
		lb/ft												
762	30	kg/m												
		lb/ft												
812.8	32	kg/m												
		lb/ft												
863.6	34	kg/m												
		lb/ft												
914.4	36	kg/m												
		lb/ft												
1016	40	kg/m												
		lb/ft												

This table is also applicable to s