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English version

Seamless and welded steel tubes - Dimensions and masses per unit length

Tubes lisses en acier, soudés et sans soudure - Tableaux généraux des dimensions et des masses linéiques

Nahtlose und geschweißte Stahlrohre - Allgemeine Tabellen für Maße und längenbezogene Masse

This European Standard was approved by CEN on 16 October 2002.

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Foreword

This document (EN 10220:2002) has been prepared by Technical Committee ECISS/TC 29, "Steel tubes and fittings for steel tubes", the Secretariat of which is held by UNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2003, and conflicting national standards shall be withdrawn at the latest by June 2003.

When transforming the European Prestandard ENV 10220 into this European Standard EN 10220, ECISS/TC 29 regarded it as necessary to avoid any conflict with and to deviate as little as possible from ISO 4200:1991 because of the international trade in steel tubes and tubular products.

Table 1 of ENV 10220, which is identical with Table 2 of ISO 4200:1991, was therefore left unchanged for EN 10220.

Table 2 of EN 10220 contains dimensions for heavy wall tubes, that are not covered by ISO 4200:1991.

All parts of the European Standard series EN 10305 on steel tubes for precision applications contain tables with preferred dimensions, that are specific for the various parts of the standards series and the products and fields of application specified therein. Therefore, Table 3 from ENV 10220 with preferred dimensions for steel tubes for precision applications has become unnecessary, and has not been included in this standard.

This document supersedes ENV 10220:1993.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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1 Scope

This European Standard specifies, for seamless and welded circular steel tubes for general purposes (e. g. mechanical, pressure and structural applications), the following:

— preferred dimensions for outside diameter and wall thickness in millimetres and

— masses per unit length in kilogrammes per metre of plain end tube.

Technical Committees of ECISS and CEN should select these preferred dimensions for their product or functional standards, where appropriate.

The outside diameters are classified into three series reflecting the availability of accessories for piping systems (see Clause 4). This classification of outside diameters into different series and of preferred wall thicknesses indicates the range of steel tubes usually produced.

NOTE Information on dimensions for steel tubes for special applications can be found in other European Standards, e.g. prEN 10255, EN 10305 series, EN ISO 11960 and EN ISO 11961, information on dimensions for stainless steel tubes in EN ISO 1127.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

prEN 10266, *Steel tubes, fittings and structural hollow sections – Symbols and definition of terms for use in product standards.*

3 Terms and definitions

For the purpose of this European Standard the terms and definitions in prEN 10266 apply.

4 Classification of outside diameters

The outside diameters given in Tables 1 and 2 are classified into three series which may be described in the following way:

— series 1: outside diameters for which all the accessories needed for the construction of piping systems are standardized;

— series 2: outside diameters for which not all accessories are standardized;

— series 3: outside diameters for which very few standardized accessories exist.

NOTE 1 It is recommended to select, for tubes intended to be used as components of piping systems, outside diameters from series 1 in Table 1. Tubes with outside diameters in accordance with series 2 and 3 may not, or not easily, be available.

NOTE 2 Accessories for heavy wall tubes with dimensions in accordance with Table 2 may not be available regardless of the series in Table 1 to which the relevant outside diameter is allocated.

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5 Method of calculating masses per unit length

The masses per unit length given in Tables 1 and 2 have been calculated from outside diameter D and wall thickness T to at least five significant figures, using the formula given below. They have been rounded to three significant figures for values of less than 100 and to the nearest whole number for larger values.

$$M = (D - T)\ T \times 0{,}0246615^{1)}\ \text{kg/m}$$

where

M is the mass per unit length in kg/m,

D is the specified outside diameter in mm and

T is the specified wall thickness in mm.

The calculated values may also be applied to tubes with different density values, but have then to be multiplied by a factor of

— 1,015 for austenitic stainless steel[2)]

— 0,985 for ferritic and martensitic stainless steel[3)] .

NOTE EN 10088-1 provides distinguished density values for various groups of stainless steel grades which may be used for calculating purposes.

6 Dimensions and masses per unit length

Table 1 gives dimensions consisting of outside diameters D, from 3 series as described in Clause 4, and related wall thicknesses $T \leq 65$ mm and the calculated masses per unit length of plain end tube.

Table 2 gives dimensions consisting of outside diameters D and related wall thicknesses T from 70 mm to 100 mm and the calculated masses per unit length of plain end tube.

1) This factor is based on a density of 7,85 kg/dm³.

2) This factor is based on a density of 7,97 kg/dm³.

3) This factor is based on a density of 7,73 kg/dm³.

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Table 1 – Dimensions (wall thicknesses $T \leq 65$ mm) and masses per unit length

Outside diameter D mm series			Wall thickness T, mm																			
			0,5	0,6	0,8	1	1,2	1,4	1,6	1,8	2	2,3	2,6	2,9	3,2	3,6	4	4,5	5	5,4	5,6	6,3
1	2	3	Mass per unit length, kg/m																			
10,2			0,120	0,142	0,185	0,227	0,266	0,304	0,339	0,373	0,404	0,448	0,487									
	12		0,142	0,169	0,221	0,271	0,320	0,366	0,410	0,453	0,493	0,550	0,603	0,651	0,694							
	12,7		0,150	0,179	0,235	0,289	0,340	0,390	0,438	0,484	0,528	0,590	0,648	0,701	0,750							
13,5			0,160	0,191	0,251	0,308	0,364	0,418	0,470	0,519	0,567	0,636	0,699	0,758	0,813	0,879						
		14	0,166	0,198	0,260	0,321	0,379	0,435	0,489	0,542	0,592	0,664	0,731	0,794	0,852	0,923						
	16		0,191	0,228	0,300	0,370	0,438	0,504	0,568	0,630	0,691	0,777	0,859	0,937	1,01	1,10	1,18					
17,2			0,206	0,246	0,324	0,400	0,474	0,546	0,616	0,684	0,750	0,845	0,936	1,02	1,10	1,21	1,3	1,41				
		18	0,216	0,257	0,339	0,419	0,497	0,573	0,647	0,719	0,789	0,891	0,987	1,08	1,17	1,28	1,38	1,50				
	19		0,228	0,272	0,359	0,444	0,527	0,608	0,687	0,764	0,838	0,947	1,05	1,15	1,25	1,37	1,48	1,61	1,73			
	20		0,240	0,287	0,379	0,469	0,556	0,642	0,726	0,808	0,888	1,00	1,12	1,22	1,33	1,46	1,58	1,72	1,85			
21,3			0,256	0,306	0,404	0,501	0,595	0,687	0,777	0,866	0,952	1,08	1,20	1,32	1,43	1,57	1,71	1,86	2,01	2,12		
		22	0,265	0,317	0,418	0,518	0,616	0,711	0,805	0,897	0,996	1,12	1,24	1,37	1,48	1,63	1,78	1,94	2,10	2,21		
	25		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	1,90	2,07	2,28	2,47	2,61	2,68	2,91
		25,4	0,307	0,367	0,485	0,602	0,716	0,829	0,939	1,05	1,15	1,31	1,46	1,61	1,75	1,94	2,11	2,32	2,52	2,66	2,73	2,97
26,9			0,326	0,389	0,515	0,639	0,761	0,880	0,998	1,11	1,23	1,40	1,56	1,72	1,87	2,07	2,26	2,49	2,70	2,86	2,94	3,20
		30	0,364	0,435	0,576	0,715	0,852	0,987	1,12	1,25	1,38	1,57	1,76	1,94	2,11	2,34	2,56	2,83	3,08	3,28	3,27	3,68
	31,8		0,386	0,462	0,612	0,760	0,906	1,05	1,19	1,33	1,47	1,67	1,87	2,07	2,26	2,50	2,74	3,03	3,30	3,52	3,62	3,96
	32		0,388	0,465	0,616	0,765	0,911	1,06	1,20	1,34	1,48	1,68	1,89	2,08	2,27	2,52	2,76	3,05	3,33	3,54	3,65	3,99
33,7			0,409	0,490	0,649	0,806	0,962	1,12	1,27	1,42	1,56	1,78	1,99	2,20	2,41	2,67	2,93	3,24	3,54	3,77	3,88	4,26
		35	0,425	0,509	0,675	0,838	1,00	1,16	1,32	1,47	1,63	1,85	2,08	2,30	2,51	2,79	3,06	3,38	3,70	3,94	4,06	4,46
	38		0,462	0,553	0,734	0,912	1,09	1,26	1,44	1,61	1,78	2,02	2,27	2,51	2,75	3,05	3,35	3,72	4,07	4,34	4,47	4,93
	40		0,487	0,583	0,773	0,962	1,15	1,33	1,52	1,70	1,87	2,14	2,40	2,65	2,90	3,23	3,55	3,94	4,32	4,61	4,75	5,24
42,4			0,517	0,619	0,821	1,02	1,22	1,42	1,61	1,80	1,99	2,27	2,55	2,82	3,09	3,44	3,79	4,21	4,61	4,93	5,08	5,61
		44,5	0,543	0,650	0,862	1,07	1,28	1,49	1,69	1,90	2,10	2,39	2,69	2,98	3,26	3,63	4,00	4,44	4,87	5,21	5,37	5,94
48,3				0,706	0,937	1,17	1,39	1,62	1,84	2,06	2,28	2,61	2,93	3,25	3,56	3,97	4,37	4,86	5,34	5,71	5,90	6,53
	51			0,746	0,990	1,23	1,47	1,71	1,95	2,18	2,42	2,76	3,10	3,44	3,77	4,21	4,64	5,16	5,67	6,07	6,27	6,94
		54		0,790	1,05	1,31	1,56	1,82	2,07	2,32	2,56	2,93	3,30	3,65	4,01	4,47	4,93	5,49	6,04	5,47	6,68	7,41
	57			0,835	1,11	1,38	1,65	1,92	2,19	2,45	2,71	3,10	3,49	3,87	4,25	4,74	5,23	5,83	6,41	6,87	7,10	7,88
60,3				0,883	1,17	1,46	1,75	2,03	2,32	2,60	2,88	3,29	3,70	4,11	4,51	5,03	5,55	6,19	6,82	7,31	7,55	8,39
	63,5			0,931	1,24	1,54	1,84	2,14	2,44	2,74	3,03	3,47	3,90	4,33	4,76	5,32	5,87	6,55	7,21	7,74	8,00	8,89
	70				1,37	1,70	2,04	2,37	2,70	3,03	3,35	3,84	4,32	4,80	5,27	5,90	6,51	7,27	8,01	8,60	8,89	9,90
		73			1,42	1,78	2,12	2,47	2,82	3,16	3,50	4,01	4,51	5,01	5,51	6,16	6,81	7,60	8,38	9,00	9,31	10,4
76,1					1,49	1,85	2,22	2,58	2,94	3,30	3,65	4,19	4,71	5,24	5,75	6,44	7,11	7,95	8,77	9,42	9,74	10,8
		82,5			1,61	2,01	2,41	2,80	3,19	3,58	3,97	4,55	5,12	5,69	6,26	7,00	7,74	8,66	9,56	10,3	10,6	11,8
88,9					1,74	2,17	2,60	3,02	3,44	3,87	4,29	4,91	5,53	6,15	6,76	7,57	8,38	9,37	10,3	11,1	11,5	12,8
	101,6						2,97	3,46	3,95	4,43	4,91	5,63	6,35	7,06	7,77	8,70	9,63	10,8	11,9	12,8	13,3	14,8
		108					3,16	3,68	4,20	4,71	5,23	6,00	6,76	7,52	8,27	9,27	10,3	11,5	12,7	13,7	14,1	15,8
114,3							3,35	3,90	4,45	4,99	5,54	6,35	7,16	7,97	8,77	9,83	10,9	12,2	13,5	14,5	15,0	16,8
	127								4,95	5,56	6,17	7,07	7,98	8,88	9,77	11,0	12,1	13,6	15,0	16,2	16,8	18,8
	133								5,18	5,82	6,46	7,41	8,36	9,30	10,2	11,5	12,7	14,3	15,8	17,0	17,6	19,7
139,7									5,45	6,12	6,79	7,79	8,79	9,78	10,8	12,1	13,4	15,0	16,6	17,9	18,5	20,7
		141,3							5,51	6,19	6,87	7,88	8,89	9,90	10,9	12,2	13,5	15,2	16,8	18,1	18,7	21,0
		152,4							5,95	6,69	7,42	8,51	9,61	10,7	11,8	13,2	14,6	16,4	18,2	19,6	20,3	22,7
		159							6,21	6,98	7,74	8,89	10,0	11,2	12,3	13,8	15,3	17,1	19,0	20,5	21,2	23,7
168,3									6,58	7,39	8,20	9,42	10,6	11,8	13,0	14,6	16,2	18,2	20,1	21,7	22,5	25,2
		177,8								7,81	8,67	9,95	11,2	12,5	13,8	15,5	17,1	19,2	21,3	23,0	23,8	26,6
		193,7								8,52	9,46	10,9	12,3	13,6	15,0	16,9	18,7	21,0	23,3	25,1	26,0	29,1
219,1										9,65	10,7	12,3	13,9	15,5	17,0	19,1	21,2	23,8	26,4	28,5	29,5	33,1
		244,5									12,0	13,7	15,5	17,3	19,0	21,4	23,7	26,6	29,5	31,8	33,0	37,0
273											13,4	15,4	17,3	19,3	21,3	23,9	26,5	29,8	33,0	35,6	36,9	41,4
323,9													20,6	23,0	25,3	28,4	31,6	35,4	39,3	42,4	44,0	49,3
355,6													22,6	25,2	27,8	31,3	34,7	39,0	43,2	46,6	48,3	54,3
406,4													25,9	28,9	31,8	35,8	39,7	44,6	49,5	53,4	55,4	62,2
457															35,8	40,3	44,7	50,2	56,7	60,1	62,3	70,0
508															39,8	44,8	49,7	55,9	62,0	66,9	69,4	77,9
		559													43,9	49,3	54,7	61,5	68,3	73,7	76,4	85,9
610															47,9	53,8	59,8	67,2	74,6	80,5	83,5	93,8
		660															64,7	72,7	80,8	87,2	90,4	102
711																	69,7	78,4	87,1	94,0	97,4	109
	762																74,8	84,1	93,3	101	104	117
813																	79,8	89,7	99,6	108	112	125
		864															84,8	95,4	106	114	119	133
914																	89,8	101	112	121	125	141
1016																	99,8	112	125	135	140	157
1067																			131	141	147	165
1118																			137	148	154	173
	1168																		143	155	161	180
1219																			150	162	168	188
	1321																				182	204
1422																					196	220
	1524																					236
1626																						252
	1727																					
1829																						
	1930																					
2032																						
	2134																					
2235																						
	2337																					
	2438																					
2540																						

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Table 1 (continued)

Outside diameter D mm series			Wall thickness T, mm																						
			7,1	8	8,8	10	11	12,5	14,2	16	17,5	20	22,2	25	28	30	32	36	40	45	50	55	60	65
1	2	3	Mass per unit length, kg/m																						
10,2																									
	12																								
	12,7																								
13,5																									
		14																							
	16																								
17,2																									
		18																							
	19																								
	20																								
21,3																									
		22																							
	25																								
		25,4																							
26,9			3,47	3,73																					
		30	4,01	4,34																					
	31,8		4,32	4,70																					
	32		4,36	4,74																					
33,7			4,66	5,07	5,40																				
		35	4,89	5,33	5,69																				
	38		5,41	5,92	6,34	6,91																			
	40		5,76	6,31	6,77	7,40																			
42,4			6,18	6,79	7,29	7,99																			
		44,5	6,55	7,20	7,75	8,51	9,09	9,86																	
48,3			7,21	7,95	8,57	9,45	10,1	11,0																	
	51		7,69	8,48	9,16	10,1	10,9	11,9																	
		54	8,21	9,08	9,81	10,9	11,7	12,8	13,9																
	57		8,74	9,67	10,5	11,6	12,5	13,7	15,0																
60,3			9,32	10,3	11,2	12,4	13,4	14,7	16,1	17,5															
	63,5		9,88	10,9	11,9	13,2	14,2	15,7	17,3	18,7															
	70		11,0	12,2	13,3	14,8	16,0	17,7	19,5	21,3	22,7														
		73	11,5	12,8	13,9	15,5	16,8	18,7	20,6	22,5	24,0														
76,1			12,1	13,4	14,6	16,3	17,7	19,6	21,7	23,7	25,3	27,7													
		82,5	13,2	14,7	16,0	17,9	19,4	21,6	23,9	26,2	28,1	30,8	33,0												
88,9			14,3	16,0	17,4	19,5	21,1	23,6	26,2	28,8	30,8	34,0	36,5	39,4											
	101,6		16,5	18,5	20,1	22,6	24,6	27,5	30,6	33,8	36,3	40,2	43,5	47,2	50,8										
		108	17,7	19,7	21,5	24,2	26,3	29,4	32,8	36,3	39,1	43,4	47,0	51,2	55,2	57,7									
114,3			18,8	21,0	22,9	25,7	28,0	31,4	35,1	38,8	41,8	46,5	50,4	55,1	59,6	62,4	64,9								
	127		21,0	23,5	25,7	28,9	31,5	35,3	39,5	43,8	47,3	52,8	57,4	62,9	68,4	71,8	75,0	80,8							
	133		22,0	24,7	27,0	30,3	33,1	37,1	41,6	46,2	49,8	55,7	60,7	66,6	72,5	76,2	79,7	86,1	91,7						
139,7			23,2	26,0	28,4	32,0	34,9	39,2	43,9	48,8	52,7	59,0	64,3	70,7	77,1	81,2	85,0	92,1	98,4						
		141,3	23,5	26,3	28,8	32,4	35,3	39,7	44,5	49,4	53,4	59,8	65,2	71,7	78,2	82,3	86,3	93,5	99,9						
		152,4	25,4	28,5	31,2	35,1	38,4	43,1	48,4	53,8	58,2	65,3	71,3	78,5	85,9	90,6	95,0	103	111	119					
		159	26,6	29,8	32,6	36,7	40,1	45,2	50,7	56,4	61,1	68,6	74,9	82,6	90,5	95,4	100	109	117	127					
168,3			28,2	31,6	34,6	39,0	42,7	48,0	54,0	60,1	65,1	73,1	80,0	88,3	96,9	102	108	117	127	137	146				
		177,8	29,9	33,5	36,7	41,4	45,2	51,0	57,3	63,8	69,2	77,8	85,2	94,2	103	109	115	126	136	147	158	167			
		193,7	32,7	36,6	40,1	45,3	49,6	55,9	62,9	70,1	76,0	85,7	93,9	104	114	121	128	140	152	165	177	188	198		
219,1			37,1	41,6	45,6	51,6	56,5	63,7	71,8	80,1	87,0	98,2	108	120	132	140	148	163	177	193	209	223	235	247	
		244,5	41,6	46,7	51,2	57,8	63,3	71,5	80,6	90,2	98,0	111	122	135	149	159	168	185	202	221	240	257	273	288	
273			46,6	52,3	57,3	64,9	71,1	80,3	90,6	101	110	125	137	153	169	180	190	210	230	253	275	296	315	333	
323,9			55,5	62,3	68,4	77,4	84,9	96,0	108	121	132	150	165	184	204	217	230	256	280	310	338	365	390	415	
355,6			61,0	68,6	75,3	85,2	93,5	106	120	134	146	166	183	204	226	241	255	284	311	345	377	408	437	466	
406,4			69,9	78,6	86,3	97,8	107	121	137	154	168	191	210	235	261	278	295	329	361	401	439	477	513	547	
457			78,8	88,6	97,3	110	121	137	155	174	190	216	238	266	296	316	335	374	411	457	502	545	587	628	
508			87,7	98,6	108	123	135	153	173	194	212	241	266	298	331	354	376	419	462	514	565	614	663	710	
		559	96,6	109	119	135	149	168	191	214	234	266	294	329	367	391	416	464	512	570	628	684	738	792	
610			106	119	130	148	162	184	209	234	256	291	322	361	402	429	456	510	562	627	691	753	814	874	
		660	114	129	141	160	176	200	226	254	277	316	349	392	436	466	496	554	612	683	752	821	888	954	
711			123	139	152	173	190	215	244	274	299	341	377	423	472	504	536	599	662	739	815	890	963	1036	
	762		132	149	163	185	204	231	262	294	321	366	405	454	507	542	576	645	712	796	878	959	1039	1117	
813			141	159	175	198	218	247	280	314	343	391	433	486	542	579	616	690	763	852	941	1028	1114	1199	
		864	150	169	186	211	231	262	298	335	365	416	461	517	577	617	657	735	813	909	1004	1097	1190	1281	
914			159	179	196	223	245	278	315	354	387	441	488	548	612	654	696	780	862	964	1065	1165	1264	1361	
1016			177	199	219	248	273	309	351	395	431	491	544	611	682	729	777	870	963	1078	1191	1303	1415	1524	
1067			186	209	230	261	286	325	369	415	453	516	572	642	717	767	817	915	1013	1134	1254	1373	1490	1606	
1118			195	219	241	273	300	341	387	435	475	542	600	674	753	805	857	961	1063	1191	1317	1442	1556	1688	
	1168		203	229	252	286	314	356	404	455	497	566	627	705	787	842	896	1005	1113	1246	1379	1510	1639	1768	
1219			212	239	263	298	328	372	422	475	519	591	655	736	822	880	937	1050	1163	1303	1441	1579	1715	1850	
	1321		230	259	285	323	355	403	458	515	563	642	711	799	893	955	1017	1141	1264	1416	1567	1717	1866	2013	
1422			248	279	307	348	383	435	493	555	606	692	766	861	963	1030	1097	1231	1363	1528	1692	1854	2015	2175	
	1524		266	299	329	373	410	466	529	595	650	742	822	924	1033	1105	1177	1321	1464	1641	1818	1993	2166	2339	
1626			283	319	351	399	438	497	564	635	694	792	878	987	1103	1181	1258	1412	1565	1755	1943	2131	2317	2502	
	1727		301	339	373	423	466	529	600	675	738	842	933	1049	1173	1256	1338	1501	1664	1867	2068	2268	2467	2664	
1829			319	359	395	449	493	560	636	715	782	892	989	1112	1244	1331	1418	1592	1765	1980	2194	2406	2618	2828	
	1930			379	417	474	521	591	671	755	825	942	1044	1175	1313	1406	1498	1682	1864	2092	2318	2543	2767	2990	
2032				399	439	499	548	623	707	795	869	992	1100	1237	1384	1481	1578	1772	1965	2205	2444	2682	2918	3153	
	2134				461	524	576	654	742	836	913	1043	1156	1300	1454	1557	1659	1863	2066	2318	2570	2820	3069	3317	
2235					483	549	604	685	778	876	957	1093	1211	1363	1524	1631	1739	1952	2165	2430	2694	2957	3218	3479	
	2337					574	631	717	813	916	1001	1143	1267	1425	1594	1707	1819	2043	2266	2544	2820	3095	3369	3642	
	2438					599	658	748	849	956	1045	1193	1323	1488	1664	1782	1899	2133	2366	2656	2945	3232	3519	3804	
2540						624	686	779	885	996	1089	1243	1378	1551	1735	1857	1979	2223	2466	2769	3070	3371	3670	3967	

Table 2 – Dimensions (wall thicknesses 70 mm ≤ *T* ≤ 100 mm) and masses per unit length

Outside Diameter	Wall thickness *T*, mm			
	70	80	90	100
D mm	Mass per unit length kg/m			
219,1	257			
244,5	301	325		
273	350	381		
323,9	438	481	519	552
355,6	493	544	590	630
406,4	581	644	702	765
457	668	744	815	880
508	756	844	928	1006
559	844	945	1041	1132
610	932	1046	1154	1258
660	1019	1144	1265	1381
711	1107	1245	1378	1507

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