INTERNATIONAL STANDARD 1704

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION • МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ • ORGANISATION INTERNATIONALE DE NORMALISATION

Shipbuilding — Anchor chains

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FOREWORD

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Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

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It has been approved by the Member Bodies of the following countries :

Australia	Ireland	South Africa, Rep. of
Austria	Israel	Spain
Czechoslovakia	Japan	Sweden
Egypt, Arab Rep. of	Netherlands	Thailand
Finland	Poland	Turkey
Germany	Portugal	United Kingdom
India	Romania	U.S.S.R.

The Member Bodies of the following countries expressed disapproval of the document on technical grounds :

Belgium
France
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Norway

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Shipbuilding — Anchor chains

ERRATUM

Page 11 : Replace the values in the last column of the table (*m*) with the following values :

m
109
113
116
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213

Shipbuilding — Anchor chains

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the shape, proportions, tolerances and material of the component parts of anchor chains for ships.

2 SHAPE AND DIMENSIONS

2.1 Shape

The stud links, shackles, shackle bolts and studless links shall be of the shapes and proportions shown in section 5. All links and shackles shall be of uniform shape.

2.2 Dimensions

The dimensions of stud links, shackles, shackle bolts and studless links shall be in accordance with the specified proportions.

The nominal diameters of the links shall be measured at the crown of the links.

All dimensions, based on the nominal diameters d of the common links, shall be measured after the chain and shackles have been subjected to the statutory proof loads.

2.2.1 *Enlarged links*

The proportions of the enlarged links are the same as those of the common links.

2.2.2 *Common links and enlarged links*

The inside radii of common links and enlarged links shall be sufficient to allow each link to bed properly and work freely.

2.2.3 *End links and studless links*

The inside radii of end links and studless links shall be equal to half the inside width and the sides shall be parallel.

3 TOLERANCES

3.1 Nominal diameter d of the common link

The allowable manufacturing tolerances on the nominal diameter d of the common links are :

- minus 1 mm up to $d = 40$ mm;
- minus 2 mm above $d = 40$ mm, up to $d = 83$ mm;
- minus 3 mm above $d = 83$ mm.

The cross-sectional area of the link shall be at least the theoretical area of the nominal diameter.

3.2 Length of five links

The allowable manufacturing tolerance on a length of five links is $^{+2,5}_{0}$ %

3.3 All other dimensions

The allowable manufacturing tolerance is ± 2,5 %, taking into account the fact that all components of the anchor chain shall be a good fit with each other.

4 MATERIAL

The quality of the material used for the manufacture of links and shackles shall not be inferior in any respect to that of the material used for the manufacture of the other component parts forming the anchor chain.

The design, material and tests of the complete anchor chains are subject to the legal requirements of the countries concerned, as well as inspection by the competent authorities.

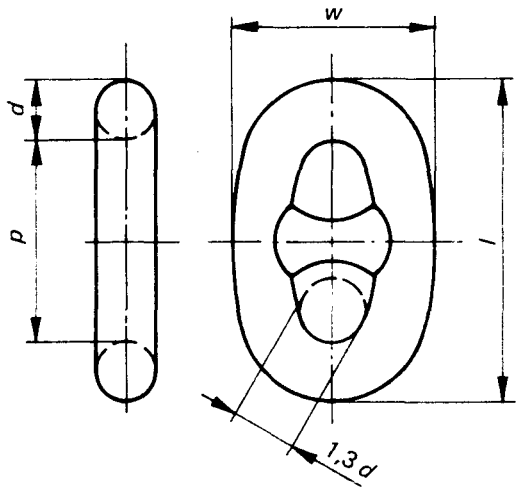
5 DIMENSIONS OF LINKS AND SHACKLES

The values given in the following tables apply to links and shackles manufactured partly or wholly from round steel bars.

The range of nominal diameters d is made up of the values specified by the Classification Societies associated in the International Association of Classification Societies (IACS).

The values of d in brackets have been added in order to meet the requirements of the Classification Societies which are members of the IACS.

5.1 Common link



d = nominal diameter of common link
l = $6\,d$
p = $4\,d$
$w \approx 3{,}6\,d$

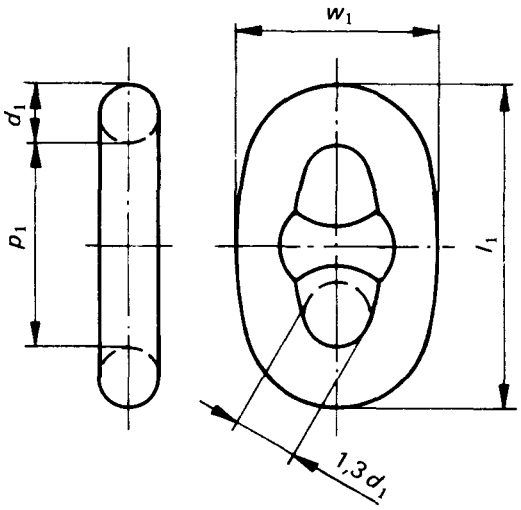
Dimensions in millimetres

d	l	p	w
17,5	105	70	63
19	114	76	68
20,5	123	82	74
22	132	88	79
24	144	96	86
26	156	104	94
28	168	112	101
30	180	120	108
32	192	128	115
34	204	136	122
36	216	144	130
38	228	152	137
40	240	160	144
42	252	168	151
44	264	176	158
46	276	184	166
48	288	192	173
50	300	200	180
52	312	208	187
54	324	216	194
56	336	224	202
58	348	232	209
60	360	240	216
62	372	248	223
64	384	256	230
66	396	264	238
68	408	272	245
70	420	280	252
73	438	292	263

Dimensions in millimetres

d	l	p	w
76	456	304	274
78	468	312	281
81	486	324	292
83	498	332	299
(84)	504	336	302
85	510	340	306
87	522	348	313
(90)	540	360	324
92	552	368	331
(95)	570	380	342
97	582	388	349
(100)	600	400	360
102	612	408	367
(105)	630	420	378
107	642	428	385
(111)	666	444	400
112	672	448	403
(114)	684	456	410
117	702	468	421
(120)	720	480	432
122	732	488	439
(124)	744	496	446
127	762	508	457
(130)	780	520	468
132	792	528	475
137	822	548	493
142	852	568	511
147	882	588	529
152	912	608	547

5.2 Enlarged link



d = nominal diameter of common link
d_1 = diameter of enlarged link ≈ 1,1 d
l_1 = 6 d_1
p_1 = 4 d_1
w_1 ≈ 3,6 d_1

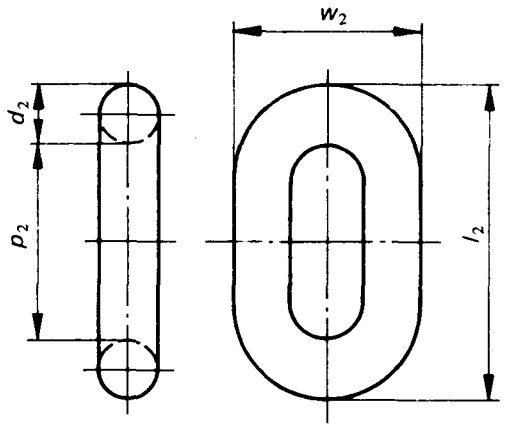
Dimensions in millimetres

d (common link)	d_1	l_1	p_1	w_1
17,5	19	114	76	68
19	20,5	123	82	74
20,5	22	132	88	79
22	24	144	96	86
24	26	156	104	94
26	28	168	112	101
28	30	180	120	108
30	34	204	136	122
32	36	216	144	130
34	38	228	152	137
36	40	240	160	144
38	42	252	168	151
40	44	264	176	158
42	46	276	184	166
44	48	288	192	173
46	50	300	200	180
48	54	324	216	194
50	56	336	224	202
52	58	348	232	209
54	60	360	240	216
56	62	372	248	223
58	64	384	256	230
60	66	396	264	238
62	68	408	272	245
64	70	420	280	252
66	73	438	292	263
68	76	456	304	274
70	78	468	312	281
73	81	486	324	292

Dimensions in millimetres

d (common link)	d_1	l_1	p_1	w_1
76	84	504	336	302
78	85	510	340	306
81	90	540	360	324
83	92	552	368	331
(84)	92	552	368	331
85	95	570	380	342
87	97	582	388	349
(90)	100	600	400	360
92	102	612	408	367
95	105	630	420	378
97	107	642	428	385
(100)	111	666	444	400
102	112	672	448	403
(105)	114	684	456	410
107	117	702	468	421
(111)	122	732	488	439
112	124	744	496	446
(114)	124	744	496	446
117	130	780	520	468
(120)	132	792	528	475
122	137	822	548	493
(124)	137	822	548	493
127	142	852	568	511
(130)	142	852	568	511
132	147	882	588	529
137	152	912	608	547
142	157	942	628	565
147	162	972	648	583
152	167	1 002	668	601

5.3 End link



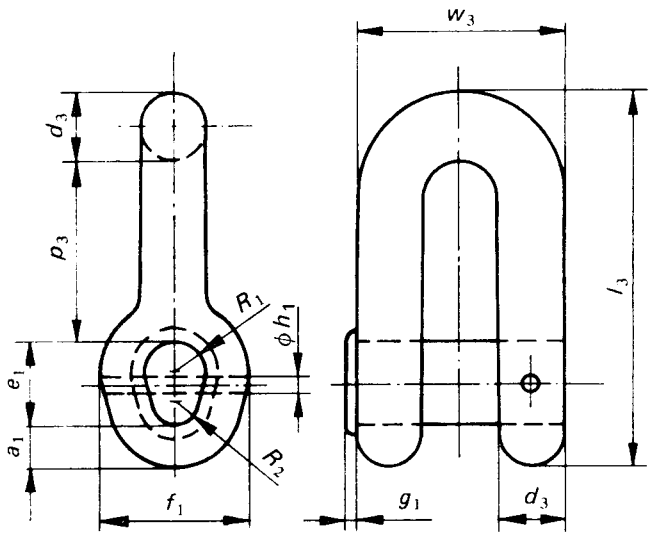
d = nominal diameter of common link
d_2 = diameter of end link ≈ 1,2 d
l_2 = $p_2 + 2\,d_2 \approx 6{,}75\,d$
p_2 ≈ 4,35 d
W_2 = 4 d

Dimensions in millimetres

Dimensions in millimetres

d (common link)	d_2	l_2	p_2	W_2	d (common link)	d_2	l_2	p_2	W_2
17,5	20,5	118	76	70	76	92	513	331	304
19	22	128	83	76	78	95	527	339	312
20,5	24	138	89	82	81	97	547	352	324
22	26	149	96	88	83	100	560	361	332
24	28	162	104	96	(84)	100	567	365	336
26	32	176	113	104	85	102	574	370	340
28	34	189	122	112	87	105	587	378	348
30	36	203	131	120	(90)	107	608	392	360
32	38	216	139	128	92	111	621	400	368
34	40	230	148	136	(95)	115	641	413	380
36	44	243	157	144	97	117	655	422	388
38	46	257	165	152	(100)	120	675	435	400
40	48	270	174	160	102	122	689	444	408
42	50	284	183	168	(105)	127	709	457	420
44	52	297	191	176	107	130	722	465	428
46	56	311	200	184	(111)	132	749	483	444
48	58	324	209	192	112	137	756	487	448
50	60	338	218	200	(114)	137	770	496	456
52	62	351	226	208	117	142	790	509	468
54	64	365	235	216	(120)	147	810	522	480
56	68	378	244	224	122	147	824	531	488
58	70	392	252	232	(124)	152	837	539	496
60	73	405	261	240	127	152	857	552	508
62	73	419	270	248	(130)	156	878	566	520
64	76	432	278	256	132	160	891	574	528
66	81	446	287	264	137	165	925	596	548
68	81	459	296	272	142	170	959	618	568
70	84	473	305	280	147	180	992	639	588
73	87	493	318	292	152	185	1 026	661	608

5.4 Joining shackle with shackle pin



d = nominal diameter of common link
d_3 = diameter of joining shackle ≈ 1,3 d
l_3 ≈ 7,1 d
p_3 = $l_3 - (d_3 + a_1 + e_1)$ ≈ 3,4 d
w_3 = 4 d
a_1 ≈ 0,8 d
e_1 ≈ 1,6 d
f_1 ≈ 2,8 d
g_1 ≈ 0,2 d
h_1 ≈ 0,4 d
R_1 ≈ 0,6 d
R_2 ≈ 0,5 d

Dimensions in millimetres

d (common link)	d_3	l_3	p_3	w_3	a_1	e_1	f_1	g_1	h_1	2 R_1	2 R_2
17,5	23	124	59	70	14	28	49	3,5		21	17,5
19	25	135	65	76	15	30	53	4		23	19
20,5	27	146	69,5	82	16,5	33	57	4		25	20,5
22	29	156	74,5	88	17,5	35	61	4,5		27	22
24	31	170	82	96	19	38	67	5	8	29	24
26	34	185	88	104	21	42	73	5		31	26
28	36	199	95,5	112	22,5	45	78	5,5		34	28
30	39	213	102	120	24	48	84	6		36	30
32	42	227	108,5	128	25,5	51	90	6,5		38	32
34	44	241	116	136	27	54	95	7		41	34
36	47	256	122	144	29	58	101	7		43	36
38	49	271	129	152	31	62	106	7,5		46	38
40	52	284	136	160	32	64	112	8	18	48	40
42	55	300	143	168	34	68	118	8,5		50	42
44	57	312	150	176	35	70	123	9		53	44
46	60	327	156	184	37	74	129	9		55	46
48	62	341	163,5	192	38,5	77	134	9,5		58	48
50	65	355	170	200	40	80	140	10		60	50
52	68	369	177	208	41	83	146	10,5		62	52
54	70	383	184	216	43	86	151	11		65	54
56	73	398	190	224	45	90	157	11		67	56
58	75	412	198	232	46	93	162	11,5		70	58
60	78	426	204	240	48	96	168	12		72	60
62	81	440	210	248	50	99	174	12,5	28	74	62
64	83	454	218	256	51	102	180	13		77	64
66	86	469	224	264	53	106	185	13		79	66
68	88	483	232	272	54	109	190	13,5		82	68
70	91	497	238	280	56	112	196	14		84	70
73	95	518	248	292	58	117	204	14,5		88	73

5.4 (*concluded*)

Dimensions in millimetres

d (common link)	d_3	l_3	p_3	w_3	a_1	e_1	f_1	g_1	h_1	$2R_1$	$2R_2$
76	99	540	258	304	61	122	213	15	28	91	76
78	101	554	266	312	62	125	218	15,5		94	78
81	105	575	275	324	65	130	227	16		97	81
83	108	589	282	332	66	133	232	16,5		100	83
(84)	109	596	286	336	67	134	236	17		101	84
85	111	604	289	340	68	136	238	17	36	102	85
87	113	618	296	348	70	139	244	17,5		104	87
(90)	117	639	306	360	72	144	252	18		108	90
92	120	653	312	368	74	147	258	18,5		110	92
(95)	124	675	323	380	76	152	266	19		114	95
97	126	689	330	388	78	155	272	19,5		116	97
(100)	130	710	340	400	80	160	280	20		120	100
102	133	724	346	408	82	163	286	20,5		122	102
(105)	137	746	357	420	84	168	294	21		126	105
107	139	760	364	428	86	171	300	21,5		128	107
(111)	144	788	377	444	89	178	311	22	46	133	111
112	146	795	379	448	90	180	314	22,5		134	112
(114)	148	809	388	456	91	182	319	23		137	114
117	152	831	398	468	94	187	328	23,5		140	117
(120)	156	852	408	480	96	192	336	24		144	120
122	159	866	414	488	98	195	342	24,5		146	122
(124)	161	880	422	496	99	198	347	25		149	124
127	165	902	432	508	102	203	356	25,5		152	127
(130)	169	923	442	520	104	208	364	26		156	130
132	172	937	448	528	106	211	370	26,5		158	132
137	178	973	466	548	110	219	384	27,5		164	137
142	185	1 008	482	568	114	227	398	28,5		170	142
147	191	1 044	500	588	118	235	412	29,5		176	147
152	198	1 079	516	608	122	243	426	30,5		182	152