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ISO

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION

ISO RECOMMENDATION
R 347

SHIPBUILDING DETAILS
ANCHOR CHAINS
END SHACKLES

1st EDITION

October 1963

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BRIEF HISTORY

The ISO Recommendation R 347, *Anchor Chains. End Shackles*, was drawn up by Technical Committee ISO/TC 8, *Shipbuilding Details*, the Secretariat of which is held by the Stichting Nederlands Normalisatie-instituut (NNI).

Work on this question by the Technical Committee began in 1960, taking into account the studies which had been made by the former International Federation of the National Standardizing Associations (ISA), and led, in 1961, to the adoption of a Draft ISO Recommendation.

In June 1962, this Draft ISO Recommendation (No. 509) 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:

Belgium	France	New Zealand
Burma	Germany	Poland
Chile	Greece	Spain
Czechoslovakia	Japan	Switzerland
Finland	Netherlands	Turkey
		United Kingdom

Two Member Bodies opposed the approval of the Draft:

Italy, U.S.S.R.

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

ISO Recommendation R 347 October 1963

SHIPBUILDING DETAILS

ANCHOR CHAINS

END SHACKLES

1. GENERAL REMARKS

1.1 Shape and dimensions

1.1.1 End shackles and end shackle bolts should be of the shapes and proportions shown in this ISO Recommendation, and their dimensions should be in accordance with the Table. All end shackles should be of uniform shape.

1.1.2 All dimensions specified in this ISO Recommendation apply *after* the end shackles have been subjected to the statutory proof loads.

1.2 Tolerance

The allowable manufacturing tolerance for the dimensions d_1, B, B_1, C, H and E is $\pm$ 2 per cent.

1.3 Material

The quality of the material used for the manufacture of the end shackle should not be inferior in any respect to that of the material used for the manufacture of the other parts assembled to form the anchor chain.

The design, material and tests of the complete anchor chains are subject to the legal requirements of the countries concerned and of the recognized approving authorities.

1.4 References

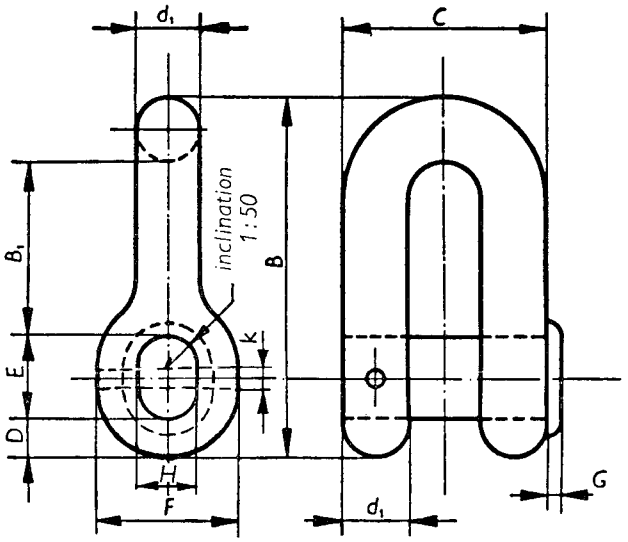
For other parts of the anchor chain, see:

ISO Recommendation R 39, *Anchor Chains — Lugless Joining Shackles, Kenter Type,*

ISO Recommendation R 40, *Anchor Chains — Studless Links*, and

ISO Recommendation R 170, *Anchor Chains, Stud Links (Common Links, Enlarged Links, End Links and Joining Shackles).*

2. DIMENSIONS



A = nominal dimension of end shackle = d

d = diameter of material of common link *
2 values: d' = millimetre value of d
d'' = inch value of d, transposed into rounded off millimetre value

d_1 = diameter of material of end shackle $= 1.4 \frac{d' + d''}{2}$

$B = 8.7 \frac{d' + d''}{2}$ $\quad B_1 = B - (d_1 + D + E)$ $\quad C = 5.2 \frac{d' + d''}{2}$

$D = 0.9 \frac{d' + d''}{2}$ $\quad E = 1.8 \frac{d' + d''}{2}$ $\quad F = 3.1 \frac{d' + d''}{2}$

$G = 0.2 \frac{d' + d''}{2}$ $\quad H = 1.4 \frac{d' + d''}{2}$ $\quad K = 0.4 \frac{d' + d''}{2}$

Example for A = 20.5 mm or $^{13}/_{16}$ in:

$d_1 = 1.4 \frac{20.5 + 20.6}{2} = 29$ mm **

$B = 8.7 \frac{20.5 + 20.6}{2} = 179$ mm **

$B_1 = 179 - (29 + 18.5 + 37) = 94.5$ mm

$C = 5.2 \frac{20.5 + 20.6}{2} = 107$ mm **

$D = 0.9 \frac{20.5 + 20.6}{2} = 18.5$ mm **

$E = 1.8 \frac{20.5 + 20.6}{2} = 37$ mm **

$F = 3.1 \frac{20.5 + 20.6}{2} = 64$ mm **

$G = 0.2 \frac{20.5 + 20.6}{2} = 4$ mm **

$H = 1.4 \frac{20.5 + 20.6}{2} = 29$ mm **

$K = 0.4 \frac{20.5 + 20.6}{2} = 8$ mm **

A		d (common link)		d_1	B	B_1	C	D	E	F	G	H	K
		d'	d''										
mm	in	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
11	$^{7}/_{16}$	11	11.1	15.5	96	50.5	58	10	20	34	2	15.5	4.5
12.5	$^{1}/_{2}$	12.5	12.7	17.5	110	58.5	66	11.5	22.5	39	2.5	17.5	5
14.5	$^{9}/_{16}$	14.5	14.3	20	125	66	75	13	26	45	3	20	6
16	$^{5}/_{8}$	16	15.9	22.5	139	73	83	14.5	29	49	3	22.5	6.5
17.5	$^{11}/_{16}$	17.5	17.5	24.5	152	80	91	16	31.5	54	3.5	24.5	7
19	$^{3}/_{4}$	19	19.1	26.5	166	88.5	99	17	34	59	4	26.5	7.5
20,5	$^{13}/_{16}$	20.5	20.6	29	179	94.5	107	18.5	37	64	4	29	8
22	$^{7}/_{8}$	22	22.2	31	192	101	115	20	40	69	4.5	31	9
24	$^{15}/_{16}$	24	23.8	33.5	208	110	124	21.5	43	74	5	33.5	9.5
25.5	1	25.5	25.4	36	221	116	132	23	46	79	5	36	10

* see ISO Recommendation R 170, section 2,
** Rounded off.

A		d (common link)		d_1	B	B_1	C	D	E	F	G	H	K
		d'	d''										
mm	in	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm
27	1 1/16	27	27.0	38	235	124	140	24	49	84	5.5	38	11
28.5	1 1/8	28.5	28.6	40	248	131	148	26	51	88	5.5	40	11.5
30	1 3/16	30	30.2	42	262	139	157	27	54	93	6	42	12
32	1 1/4	32	31.8	45	278	146	166	29	58	99	6.5	45	13
33	1 5/16	33	33.3	47	289	152	172	30	60	103	6.5	47	13
35	1 3/8	35	34.9	49	304	160	182	32	63	108	7	49	14
37	1 7/16	37	36.5	51	320	170	191	33	66	114	7.5	51	14.5
38	1 1/2	38	38.1	53	331	176	198	34	68	118	7.5	53	15
40	1 9/16	40	39.7	56	346	182	207	36	72	124	8	56	15.5
41	1 5/8	41	41.3	58	358	189	214	37	74	128	8	58	16.5
43	1 11/16	43	42.9	60	374	198	223	39	77	133	8.5	60	17
44	1 3/4	44	44.5	62	385	203	230	40	80	137	9	62	18
46	1 13/16	46	46.0	64	400	212	239	41	83	143	9	64	18.5
48	1 7/8	48	47.6	67	417	221	249	43	86	148	9.5	67	19
49	1 15/16	49	49.2	69	427	226	255	44	88	152	10	69	19.5
51	2	51	50.8	71	443	234	265	46	92	158	10	71	20.5
52	2 1/16	52	52.4	73	454	241	271	47	93	162	10.5	73	21
54	2 1/8	54	54.0	76	470	248	281	49	97	167	11	76	21.5
56	2 3/16	56	55.6	78	485	257	290	50	100	173	11	78	22.5
57	2 1/4	57	57.2	80	497	263	297	51	103	177	11.5	80	23
59	2 5/16	59	58.7	82	512	271	306	53	106	182	12	82	23.5
60	2 3/8	60	60.3	84	523	277	313	54	108	187	12	84	24
62	2 7/16	62	61.9	87	539	285	322	56	111	192	12.5	87	25
64	2 1/2	64	63.5	89	555	294	332	57	115	198	13	89	25.5
65	2 9/16	65	65.1	91	566	299	338	59	117	202	13	91	26
67	2 5/8	67	66.7	94	582	308	348	60	120	207	13.5	94	26.5
68	2 11/16	68	68.3	95	593	314	354	61	123	211	13.5	95	27.5
70	2 3/4	70	69.9	98	608	321	364	63	126	217	14	98	28
71	2 13/16	71	71.4	100	619	327	370	64	128	221	14	100	28.5
73	2 7/8	73	73.0	102	635	336	380	66	131	226	14.5	102	29
75	2 15/16	75	74.6	105	651	344	389	67	135	232	15	105	30
76	3	76	76.2	107	662	350	396	68	137	236	15	107	30
78	3 1/16	78	77.8	109	678	359	405	70	140	241	15.5	109	31
80	3 1/8	80	79.4	112	693	366	414	72	143	247	16	112	32
82	3 1/4	82	82.6	115	717	380	428	74	148	255	16.5	115	33
85	3 3/8	85	85.7	119	743	393	445	77	154	265	17	119	34
88	3 7/16	88	87.3	123	763	403	456	79	158	272	17.5	123	35
90	3 9/16	90	90.5	126	785	416	469	81	162	280	18	126	36
92	3 5/8	92	92.1	129	801	423	479	83	166	287	18.5	129	37
95	3 3/4	95	95.3	133	828	438	495	86	171	295	19	133	38
98	3 7/8	98	98.4	137	854	452	511	88	177	304	19.5	137	39
100	3 15/16	100	100	140	870	460	520	90	180	310	20	140	40

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