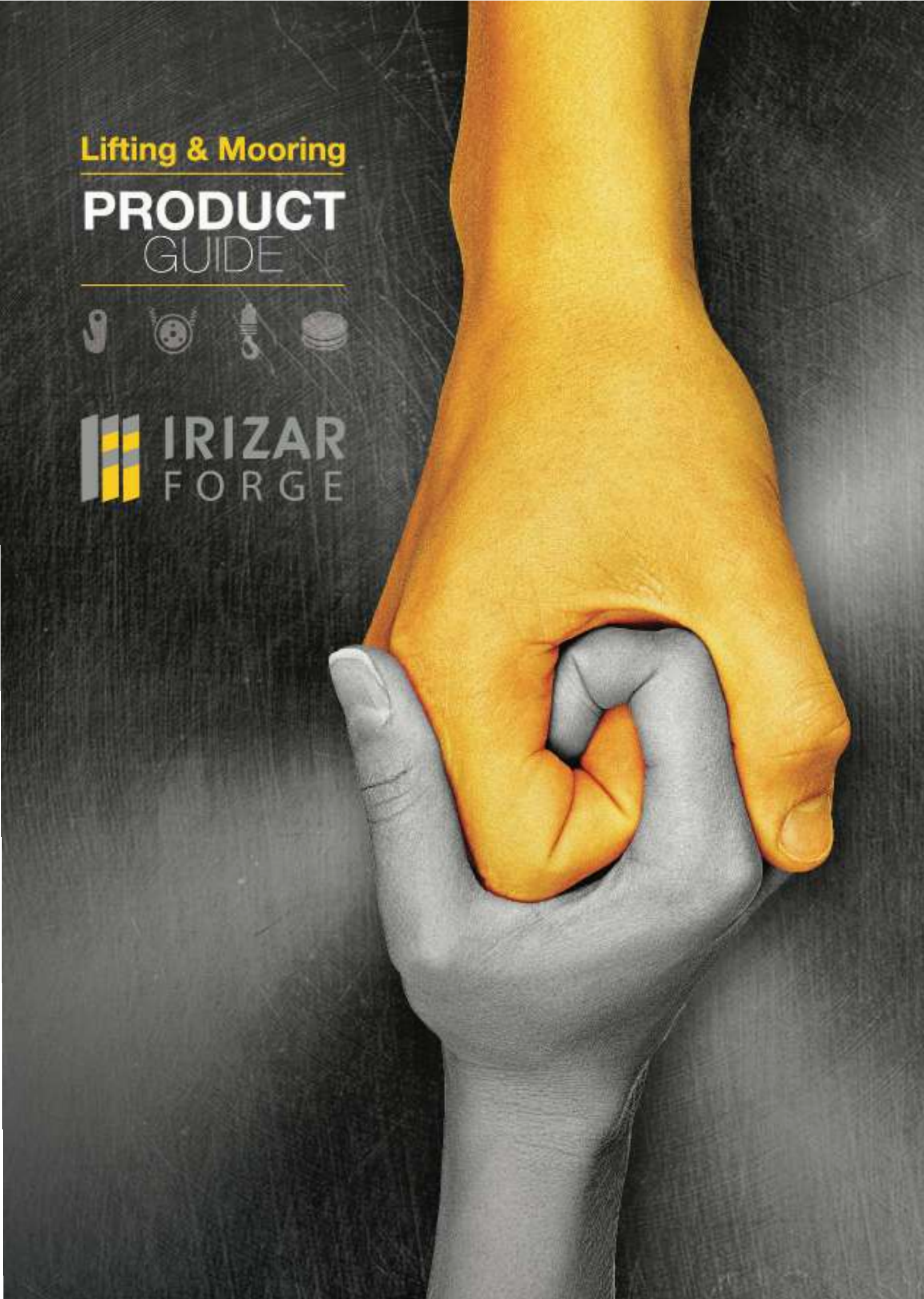
Lifting & Mooring

PRODUCT GUIDE

IRIZAR FORGE

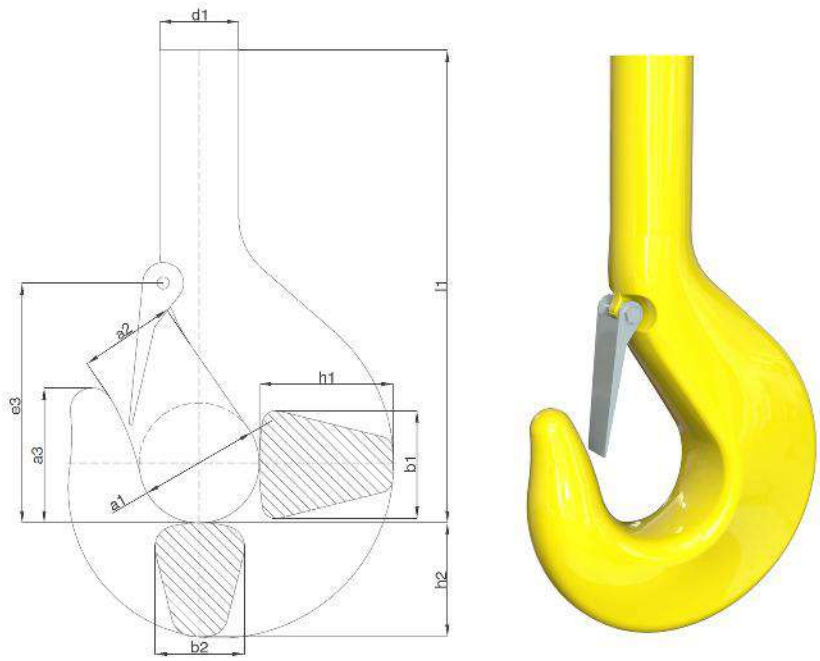


1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.1 SINGLE FORGED HOOKS BASED ON RECOGNIZED EUROPEAN DESIGNS

1.1.1.1 Single forged hooks based on DIN15401 design

1.1.1.1.1 Unmachined



- WLL: from 5t to 2.000t.
- Hook FORGED and HEAT TREATED. Machining recommended to perform by manufacturer.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, S, T, V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended after machining.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

SINGLE FORGED HOOKS BASED ON DIN15401 DESIGN I UNMACHINED

	OVERALL DIMENSIONS (mm)										Weight
No	a1	a2	a3	b1	b2	d1	e3	h1	h2	l1	Kg
2,5	63	50	72	53	45	42	132	67	58	253	6,3
4	71	56	80	63	53	48	148	80	67	285	8,8
5	80	63	90	71	60	53	165	90	75	318	12,3
6	90	71	101	80	67	60	185	100	85	380	17,1
8	100	80	113	90	75	67	210	112	95	418	24
10	112	90	127	100	85	75	221	125	106	460	40
12	125	100	143	112	95	85	252	140	118	525	55
16	140	112	160	125	106	95	280	160	132	595	77
20	160	125	180	140	118	106	330	180	150	665	112
25	180	140	202	160	132	118	360	200	170	735	160
32	200	160	225	180	150	132	400	224	190	810	220
40	224	180	252	200	170	150	447	250	212	905	310
50	250	200	285	224	190	170	485	280	236	990	430
63	280	224	320	250	212	190	550	315	265	1120	600
80	315	250	358	280	236	212	598	355	300	1270	860
100	355	280	402	315	265	236	688	400	335	1415	1220
125	400	315	450	355	300	265	750	450	375	1590	1740
160	450	355	505	400	335	300	825	500	425	1790	2480
200	500	400	565	450	375	335	900	560	475	2048	3420
250	560	450	635	500	425	375	980	630	530	2305	4800
320	630	500	715	560	475	425	1080	710	580	2605	6770
400	710	560	755	630	530	475	1195	800	630	2950	9405

Tolerances: -0/+7% forging tolerance.

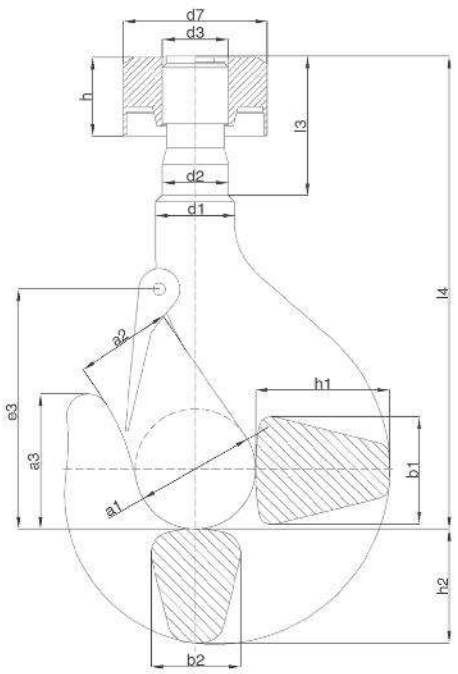
Modifications: Shank length (L). Further dimensions upon request.

1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.1 SINGLE FORGED HOOKS BASED ON RECOGNIZED EUROPEAN DESIGNS

1.1.1.1 Single forged hooks based on DIN15401 design

1.1.1.1.2 Machined fitted with nut



- WLL: from 5t to 2.000t.
- Hook and Nut FORGED, HEAT TREATED and thread fully MACHINED as per DIN15403 design.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, S, T, V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

SINGLE FORGED HOOKS BASED ON DIN15401 DESIGN I MACHINED FITTED WITH NUT

OVERALL DIMENSIONS (mm)														DIN 15413 Nut		Weight
No	a1	a2	a3	b1	b2	d1	e3	h1	h2	d2 h11	d3	l3	l4	d7	h	kg
2,5	63	50	72	53	45	42	132	67	58	36	M36	83	250	70	44	7,4
4	71	56	80	63	53	48	148	80	67	42	M42	93	281,5	80	49	10,3
5	80	63	90	71	60	53	165	90	75	45	M45	103	314,5	95	56	14,4
6	90	71	101	80	67	60	185	100	85	50	Rd50x6	112	375	115	60	20,7
8	100	80	113	90	75	67	210	112	95	56	Rd56x6	122	413	125	67	28,8
10	112	90	127	100	85	75	221	125	106	64	Rd64x8	135	446	145	76	40,9
12	125	100	143	112	95	85	252	140	118	72	Rd72x8	157	504,5	165	87	65,4
16	140	112	160	125	106	95	280	160	132	80	Rd80x10	170	576	175	91	90
20	160	125	180	140	118	106	330	180	150	90	Rd90x10	187	645	185	102	130
25	180	140	202	160	132	118	360	200	170	100	Rd100x12	207	716	205	113	184
32	200	160	225	180	150	132	400	224	190	110	Rd110x12	232	788	240	131	254
40	224	180	252	200	170	150	447	250	212	125	Rd125x14	257	885	270	144	361
50	250	200	285	224	190	170	485	280	236	140	Rd140x16	280	969	320	153	502
63	280	224	320	250	212	190	550	315	265	160	Rd160x18	322	1100	360	181	700
80	315	250	358	280	236	212	598	355	300	180	Rd180x20	357	1245	400	198	1007
100	355	280	402	315	365	236	688	400	335	200	Rd200x22	402	1388	445	228	1417
125	400	315	450	355	300	265	750	450	375	225	Rd225x24	465	1565	490	246	2026
160	450	355	505	400	335	300	825	500	425	250	Rd250x28	510	1761	530	274	2846
200	500	400	565	450	375	335	900	560	475	280	Rd280x32	613	2012	590	343	3862
250	560	450	635	500	425	375	980	630	530	320	Rd320x36	690	2272	680	383	5411
320	630	500	715	560	475	425	1080	710	580	370	Rd360x36	780	2565	760	433	7620
400	710	560	755	630	530	475	1195	800	630	415	Rd400x36	875	2878	865	482	10441

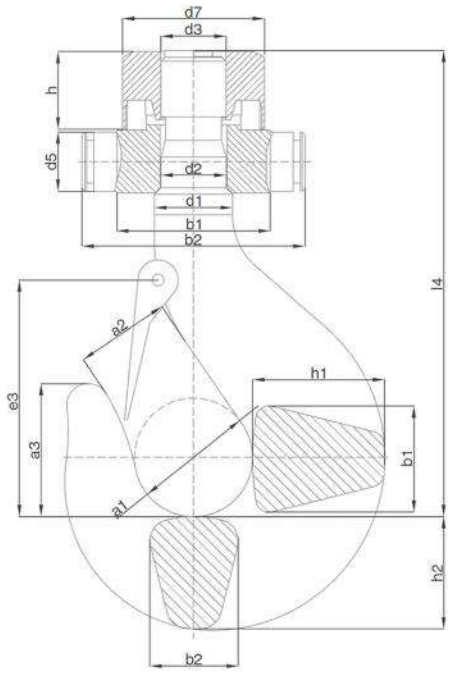
Tolerances: -0/+7% forging tolerance. Machined tolerances as per DIN15403 design.
Modifications: Shank length (L). Further dimensions upon request.

1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.1 SINGLE FORGED HOOKS BASED ON RECOGNIZED EUROPEAN DESIGNS

1.1.1.1 Single forged hooks based on DIN15401 design

1.1.1.1.3 Machined fitted with nut, crosshead and bearing



- WLL: from 5t to 2.000t.
- Hook, Nut and Crosshead FORGED, HEAT TREATED and thread fully MACHINED as per DIN15403 design.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, S, T, V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

SINGLE FORGED HOOKS BASED ON DIN15401 DESIGN I MACHINED FITTED WITH NUT, CROSSHEAD and BEARING

	OVERALL DIMENSIONS (mm)												DIN 15412 Crosshead			DIN 15413 Nut		Weight
No	a1	a2	a3	b1	b2	d1	e3	h1	h2	d2 h11	d3	l4	b1	b2	d5 h9	d7	h	kg
2,5	63	50	72	53	45	42	132	67	58	36	M36	250	80	125	30	70	44	9,2
4	71	56	80	63	53	48	148	80	67	42	M42	281,5	90	140	35	80	49	13
5	80	63	90	71	60	53	165	90	75	45	M45	314,5	100	155	40	95	56	18,6
6	90	71	101	80	67	60	185	100	85	50	Rd50x6	375	125	185	45	115	60	27,4
8	100	80	113	90	75	67	210	112	95	56	Rd56x6	413	140	210	50	125	67	38
10	112	90	127	100	85	75	221	125	106	64	Rd64x8	446	160	230	55	145	76	54,6
12	125	100	143	112	95	85	252	140	118	72	Rd72x8	504,5	180	265	60	165	87	85,5
16	140	112	160	125	106	95	280	160	132	80	Rd80x10	576	190	275	70	175	91	114,5
20	160	125	180	140	118	106	330	180	150	90	Rd90x10	645	200	295	80	185	102	158,5
25	180	140	202	160	132	118	360	200	170	100	Rd100x12	716	220	318	90	205	113	222,6
32	200	160	225	180	150	132	400	224	190	110	Rd110x12	788	260	378	100	240	131	315
40	224	180	252	200	170	150	447	250	212	125	Rd125x14	885	285	415	110	270	144	443
50	250	200	285	224	190	170	485	280	236	140	Rd140x16	969	335	465	125	320	153	630
63	280	224	320	250	212	190	550	315	265	160	Rd160x18	1100	380	522	140	360	181	885
80	315	250	358	280	236	212	598	355	300	180	Rd180x20	1245	420	565	160	400	198	1254
100	355	280	402	315	365	236	688	400	335	200	Rd200x22	1388	470	645	180	445	228	1768
125	400	315	450	355	300	265	750	450	375	225	Rd225x24	1565	510	685	200	490	246	2491
160	450	355	505	400	335	300	825	500	425	250	Rd250x28	1761	550	750	220	530	274	3483
200	500	400	565	450	375	335	900	560	475	280	Rd280x32	2012	610	810	240	590	343	4791
250	560	450	635	500	425	375	980	630	530	320	Rd320x36	2272	700	920	260	680	383	6793
320	630	500	715	560	475	425	1080	710	580	370	Rd360x36	2565	790	1030	280	760	433	9443
400	710	560	755	630	530	475	1195	800	630	415	Rd400x36	2878	895	1145	300	865	482	13220

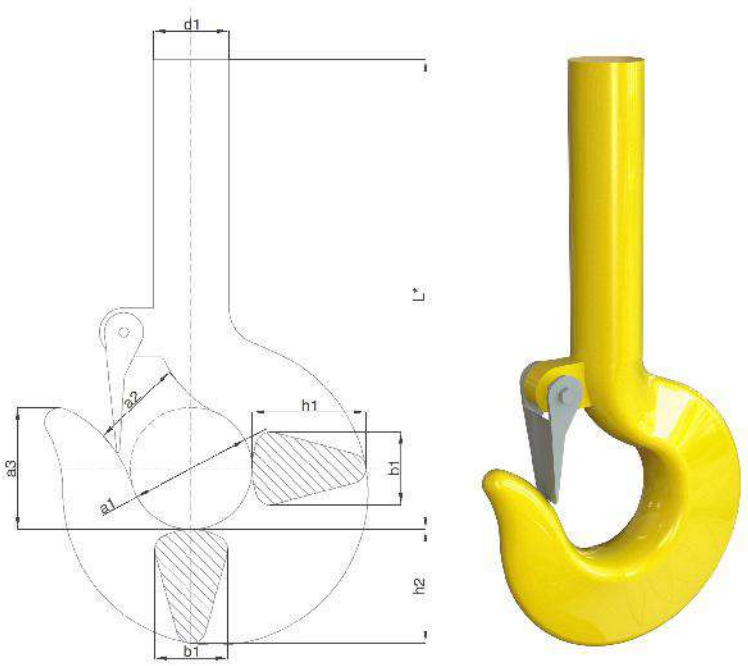
Tolerances: -0/+7% forging tolerance. Machining tolerances as per DIN15403.
Modifications: Shank length (L). Further dimensions upon request.

1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.1 SINGLE FORGED HOOKS BASED ON RECOGNIZED EUROPEAN DESIGNS

1.1.1.2 Single forged hooks based on BS2903:1980 design

1.1.1.2.1 Unmachined



- WLL: from 5t to 250t.
- Hook FORGED and HEAT TREATED. Machining recommended to perform by manufacturer.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, S, T, V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended after machining.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request

SINGLE FORGED HOOKS BASED ON BS2903:1980 DESIGN I UNMACHINED

	OVERALL DIMENSIONS (mm)								Weight
No	a1	a2	a3	b1	d1	h1	h2	L*	Kg
B5	65	49	65	39	38	60	60	253	5
B6,3	73	55	73	44	44	68	68	285	6,5
B8	83	62	84	50	50	77	77	318	10
B10	92	69	92	55	55	86	86	380	14
B12,5	103	77	104	62	60	96	96	418	19
B16	117	88	117	70	65	109	109	452	27
B20	131	98	132	79	75	122	122	510	38
B25	146	110	146	88	85	136	136	582	53
B32	159	119	160	95	90	148	148	653	69
B40	173	130	173	104	105	161	161	724	91
B50	191	143	191	115	115	178	178	796	121
B63	205	154	205	123	125	191	191	796	154

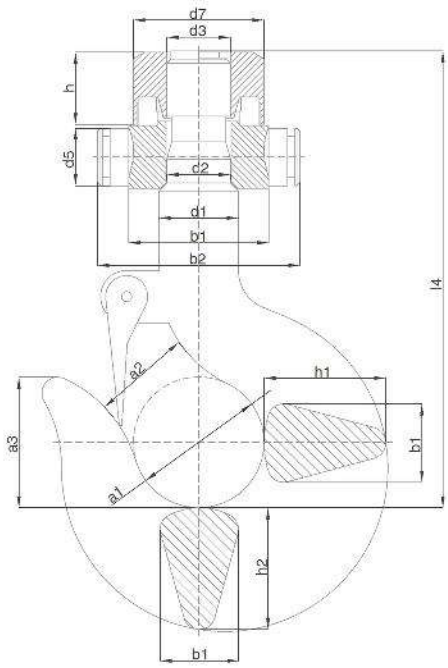
Tolerances: -0/+7% forging tolerance.
Modifications: Shank length (L). Further dimensions upon request.

1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.1 SINGLE FORGED HOOKS BASED ON RECOGNIZED EUROPEAN DESIGNS

1.1.1.2 Single forged hooks based on BS2903:1980 design

1.1.1.2.2 Machined fitted with nut, crosshead and bearing



- WLL: from 5t to 250t.
- Hook, Nut and Crosshead FORGED, HEAT TREATED and thread fully MACHINED as per DIN15403 design.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, S, T, V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

SINGLE FORGED HOOKS BASED ON DIN15401 DESIGN I MACHINED FITTED WITH NUT, CROSSHEAD and BEARING

OVERALL DIMENSIONS (mm)											DIN 15412 Crosshead			DIN 15413 Nut		Weight
No	a1	a2	a3	b1	d1	h1	h2	d2 h11	d3	l4	b1	b2	d5 h9	d7	h	kg
B5	65	49	65	39	38	60	60	30	M30	221	65	100	25	60	38	6
B6,3	73	55	73	44	44	68	68	36	M36	250	80	125	30	70	44	8,5
B8	83	62	84	50	50	77	77	42	M42	281,5	90	140	35	80	49	12,5
B10	92	69	92	55	55	86	86	45	M45	314,5	100	155	40	95	56	17,5
B12,5	103	77	104	62	60	96	96	50	Rd50x6	375	125	185	45	115	60	25
B16	117	88	117	70	65	109	109	50	Rd50x6	375	125	185	45	115	60	33
B20	131	98	132	79	75	122	122	64	Rd64x8	446	160	230	55	145	76	50
B25	146	110	146	88	85	136	136	72	Rd72x8	504,5	180	265	60	165	87	71
B32	159	119	160	95	90	148	148	72	Rd72x8	504,5	180	265	60	165	87	87
B40	173	130	173	104	105	161	161	80	Rd80x10	576	190	275	70	175	91	113
B50	191	143	191	115	115	178	178	90	Rd90x10	645	200	295	80	185	102	147
B63	205	154	205	123	125	191	191	100	Rd100x12	716	220	318	90	205	113	189

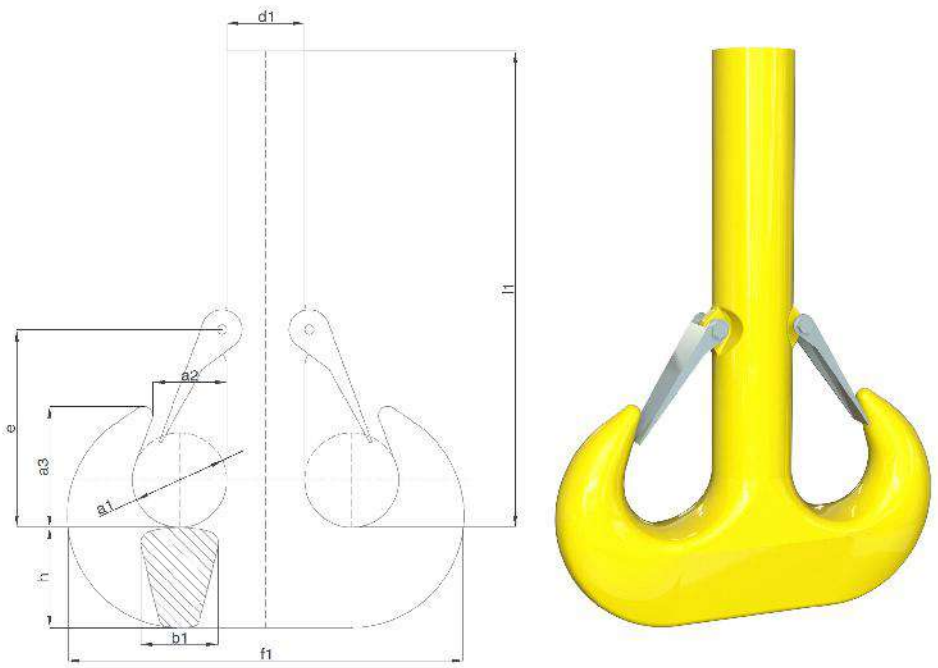
Tolerances: -0/+7% forging tolerance. Machining tolerances as per DIN15403 design.
Modifications: Shank length (L). Further dimensions upon request.

1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.2 RAMSHORN FORGED HOOKS BASED ON RECOGNIZED EUROPEAN STANDARDS

1.1.2.1 Ramshorn forged hooks based on DIN15402 design

1.1.2.1.1 Unmachined



- WLL: from 5t to 2.000t.
- Hook FORGED and HEAT TREATED. Machining recommended to perform by manufacturer.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, S, T, V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended after machining.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

RAMSHORN FORGED HOOKS BASED ON DIN15402 DESIGN I UNMACHINED

OVERALL DIMENSIONS (mm)										Weight
No	a1	a2	a3	b1	d1	e	f1	h	l1	Kg
2,5	50	40	65	40	42	112	208	50	250	6,9
4	56	45	73	48	48	124	238	60	280	9,7
5	63	50	82	53	53	143	266	67	312	13,4
6	71	56	92	60	60	160	301	75	375	16,8
8	80	63	103	67	67	182	337	85	415	25,3
10	90	71	116	75	75	192	377	95	450	36,3
12	100	80	130	85	85	210	421	106	510	50,5
16	112	90	146	95	95	237	471	118	580	71,1
20	125	100	163	106	106	265	531	132	650	99,5
25	140	112	182	118	118	315	598	150	715	138
32	160	125	205	132	132	335	672	170	790	197
40	180	140	230	150	150	375	754	190	885	286
50	200	160	260	170	170	420	842	212	965	394
63	224	180	292	190	190	460	944	236	1090	547
80	250	200	325	212	212	515	1062	265	1235	759
100	280	224	364	236	236	575	1186	300	1375	1060
125	315	250	408	265	265	645	1330	335	1550	1491
160	355	280	458	300	300	725	1505	375	1745	2115
200	400	315	515	335	335	800	1685	425	1998	3015
250	450	355	580	375	375	875	1885	475	2250	4268
320	500	400	650	425	425	950	2125	530	2550	6018
400	560	450	730	475	475	1045	2375	600	2895	8576

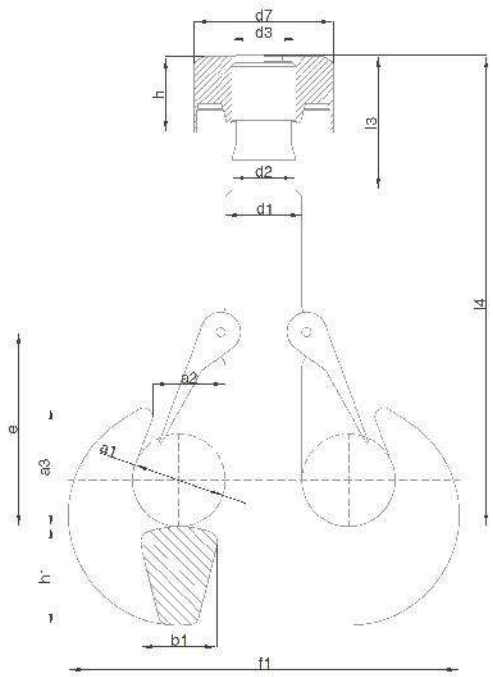
Tolerances: -0/+7% forging tolerance.
Modifications: Shank length (L). Further dimensions upon request.
Hook section: RSN up to No 10 and greater sizes RFN. For the largest hooks, other sections b1xH can be design.

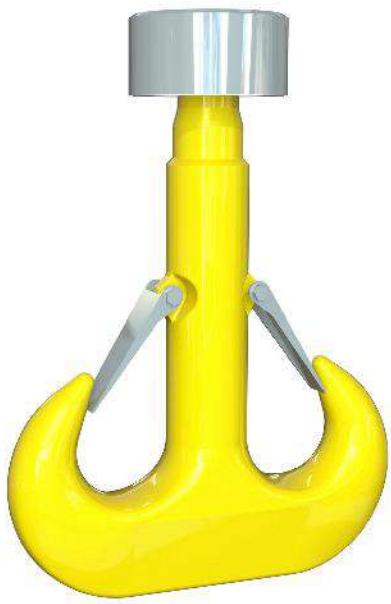
1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.2 RAMSHORN FORGED HOOKS BASED ON RECOGNIZED EUROPEAN STANDARDS

1.1.2.1 Ramshorn forged hooks based on DIN15402 design

1.1.2.1.2 Machined fitted with nut





- WLL: from 5t to 2.000t.
- Hook and Nut FORGED, HEAT TREATED and thread fully MACHINED as per DIN15403 design.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, S, T, V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

RAMSHORN FORGED HOOKS BASED ON DIN15402 | MACHINED FITTED WITH NUT

OVERALL DIMENSIONS (mm)													DIN 15413 Nut		Weight
No	a1	a2	a3	b1	d1	e	f1	h1	d2 h11	d3	l3	l4	d7	h	kg
2,5	50	40	65	40	42	112	208	50	36	M36	83	243,5	70	44	7,5
4	56	45	73	48	48	124	238	60	42	M42	93	274	80	49	10,6
5	63	50	82	53	53	143	266	67	45	M45	103	306	95	56	14,6
6	71	56	92	60	60	160	301	75	50	Rd50x6	112	365,5	115	60	20,4
8	80	63	103	67	67	182	337	85	56	Rd56x6	122	403	125	67	30,3
10	90	71	116	75	75	192	377	95	64	Rd64x8	135	435	145	76	43,3
12	100	80	130	85	85	210	421	106	72	Rd72x8	157	492	165	87	61
16	112	90	146	95	95	237	471	118	80	Rd80x10	170	562	175	91	84
20	125	100	163	106	106	265	531	132	90	Rd90x10	187	628	185	102	117
25	140	112	182	118	118	315	598	150	100	Rd100x12	207	696	205	113	161
32	160	125	205	132	132	335	672	170	110	Rd110x12	232	768	240	131	230
40	180	140	230	150	150	375	754	190	125	Rd125x14	257	863	270	144	336
50	200	160	260	170	170	420	842	212	140	Rd140x16	280	944	320	153	464
63	224	180	292	190	190	460	944	236	160	Rd160x18	322	1072	360	181	644
80	250	200	325	212	212	515	1062	265	180	Rd180x20	357	1212	400	198	901
100	280	224	364	236	236	575	1186	300	200	Rd200x22	402	1351	445	228	1249
125	315	250	408	265	265	645	1330	335	225	Rd225x24	465	1522	490	246	1765
160	355	280	458	300	300	725	1505	375	250	Rd250x28	510	1714	530	274	2463
200	400	315	515	335	335	800	1685	425	280	Rd280x32	613	1962	590	343	3437
250	450	355	580	375	375	875	1885	475	320	Rd320x36	690	2217	680	383	4852
320	500	400	650	425	425	950	2125	530	370	Rd360x36	780	2505	760	433	6817
400	560	450	730	475	475	1045	2375	600	415	Rd400x36	875	2820	865	482	9552

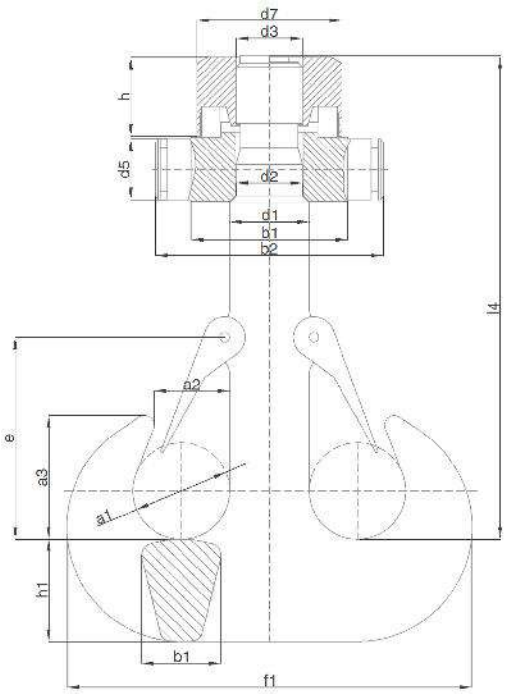
Tolerances: -0/+7% forging tolerance. Machining tolerances as per DIN15403
Modifications: Shank length (L). Further dimensions upon request.
Hook section: RSN up to No 10 and greater sizes RFN. For the largest hooks, other sections b1xH can be design.

1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.2 RAMSHORN FORGED HOOKS BASED ON RECOGNIZED EUROPEAN STANDARDS

1.1.2.1 Ramshorn forged hooks based on DIN15402 design

1.1.2.1.3 Machined fitted with nut, crosshead and bearing



- WLL: from 5t to 2.000t.
- Hook, Nut and Crosshead FORGED, HEAT TREATED and thread fully MACHINED as per DIN15403 design.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, S, T, V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

RAMSHORN FORGED HOOKS BASED ON BS3017:1980 I MACHINED FITTED WITH NUT, CROSSHEAD and BEARING

OVERALL DIMENSIONS (mm)												DIN 15412 Crosshead			DIN 15413 Nut		Weight
No	a1	a2	a3	b1	d1	e	f1	h1	d2 h11	d3	l4	b1	b2	d5 h9	d7	h	kg
2,5	50	40	65	40	42	112	208	50	36	M36	243,5	80	125	30	70	44	9,5
4	56	45	73	48	48	124	238	60	42	M42	274	90	140	35	80	49	13,5
5	63	50	82	53	53	143	266	67	45	M45	306	100	155	40	95	56	20,6
6	71	56	92	60	60	160	301	75	50	Rd50x6	365,5	125	185	45	115	60	27
8	80	63	103	67	67	182	337	85	56	Rd56x6	403	140	210	50	125	67	39,5
10	90	71	116	75	75	192	377	95	64	Rd64x8	435	160	230	55	145	76	57
12	100	80	130	85	85	210	421	106	72	Rd72x8	492	180	265	60	165	87	81
16	112	90	146	95	95	237	471	118	80	Rd80x10	562	190	275	70	175	91	108
20	125	100	163	106	106	265	531	132	90	Rd90x10	628	200	295	80	185	102	145,5
25	140	112	182	118	118	315	598	150	100	Rd100x12	696	220	318	90	205	113	199,5
32	160	125	205	132	132	335	672	170	110	Rd110x12	768	260	378	100	240	131	291
40	180	140	230	150	150	375	754	190	125	Rd125x14	863	285	415	110	270	144	418
50	200	160	260	170	170	420	842	212	140	Rd140x16	944	335	465	125	320	153	592
63	224	180	292	190	190	460	944	236	160	Rd160x18	1072	380	522	140	360	181	830
80	250	200	325	212	212	515	1062	265	180	Rd180x20	1212	420	565	160	400	198	1148
100	280	224	364	236	236	575	1186	300	200	Rd200x22	1351	470	645	180	445	228	1600
125	315	250	408	265	265	645	1330	335	225	Rd225x24	1522	510	685	200	490	246	2230
160	355	280	458	300	300	725	1505	375	250	Rd250x28	1714	550	750	220	530	274	3100
200	400	315	515	335	335	800	1685	425	280	Rd280x32	1962	610	810	240	590	343	4366
250	450	355	580	375	375	875	1885	475	320	Rd320x36	2217	700	920	260	680	383	6234
320	500	400	650	425	425	950	2125	530	370	Rd360x36	2505	790	1030	280	760	433	8791
400	560	450	730	475	475	1045	2375	600	415	Rd400x36	2820	895	1145	300	865	482	12220

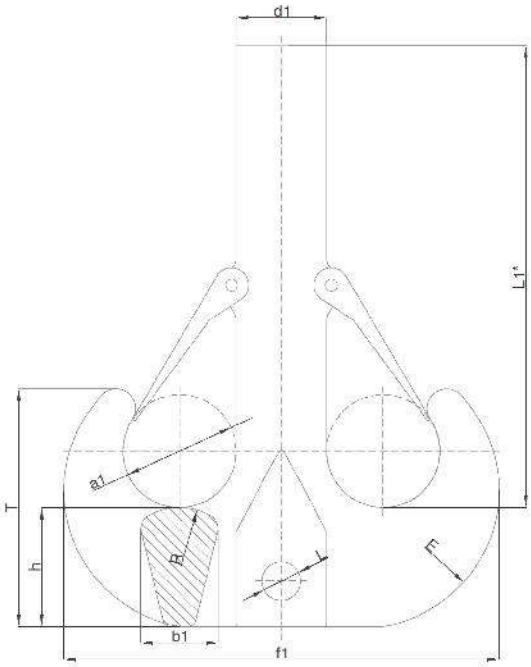
Tolerances: -0/+7% forging tolerance. Machining tolerances as per DIN15403
Modifications: Shank length (L). Further dimensions upon request.
Hook section: RSN up to Num.10 and greater sizes RFN. For the largest hooks, other sections b1xH can be design.

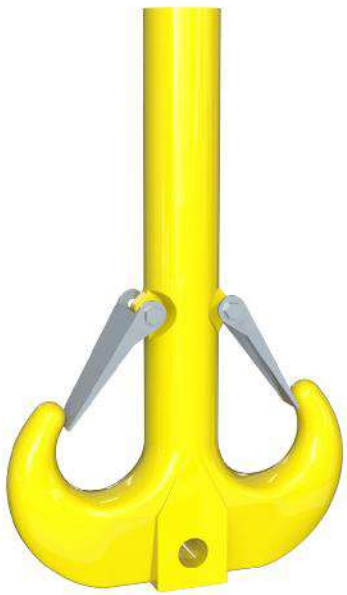
1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.2 RAMSHORN FORGED HOOKS BASED ON RECOGNIZED EUROPEAN STANDARDS

1.1.2.2 Ramshorn forged hooks based on BS3017:1980 design

1.1.2.2.1 Unmachined





- WLL: from 5t to 1.000t (bottom hole excluded).
- Hook FORGED and HEAT TREATED. Machining recommended to perform by manufacturer.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, S, T, V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended after machining.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

RAMSHORN FORGED HOOKS BASED ON BS3017:1980 I UNMACHINED

	OVERALL DIMENSIONS (mm)										Weight
No	a1	E	d1	h	L	b1	L1*	R	T	f1	Kg
B10	95	114	76	100	33	65	510	2	200	366	40
B15	108	129	83	108	40	70	580	2	219	412	50
B20	120	143	102	117	46	76	650	63	238	458	63
B25	133	157	114	132	46	86	715	71	267	510	79
B30	145	173	121	144	56	94	715	78	291	556	97
B35	153	184	127	156	56	101	790	84	313	584	118
B40	162	194	133	162	59	105	790	87	329	616	143
B45	170	203	140	175	59	114	885	94	351	654	175
B50	178	210	146	181	65	118	885	98	365	684	214
B60	191	229	152	200	65	130	965	108	400	732	262
B70	202	241	159	210	75	136	965	113	425	792	315
B80	211	260	165	225	75	147	1090	122	452	812	375
B100	229	289	178	251	84	163	1090	135	498	882	452
B120	242	311	191	273	90	177	1235	147	540	946	545
B140	255	327	203	289	97	188	1235	156	575	1004	655
B160	267	346	216	308	106	200	1235	166	610	1054	780
B180	279	365	229	327	113	213	1375	177	641	1118	935
B200	287	384	241	346	116	225	1375	187	679	1268	1109
B250	317	432	279	405	136	263	1550	219	762	1308	1335
B300	343	457	305	422	141	274	1745	228	804	1396	1610
B350	356	483	318	451	152	293	1745	244	845	1474	1915
B400	381	518	343	479	161	311	1998	259	899	1570	2300

Tolerances: -0/+7% forging tolerance.
Modifications: Shank length (L). Further dimensions upon request.
Hook section: b1xH: other sections can be design.

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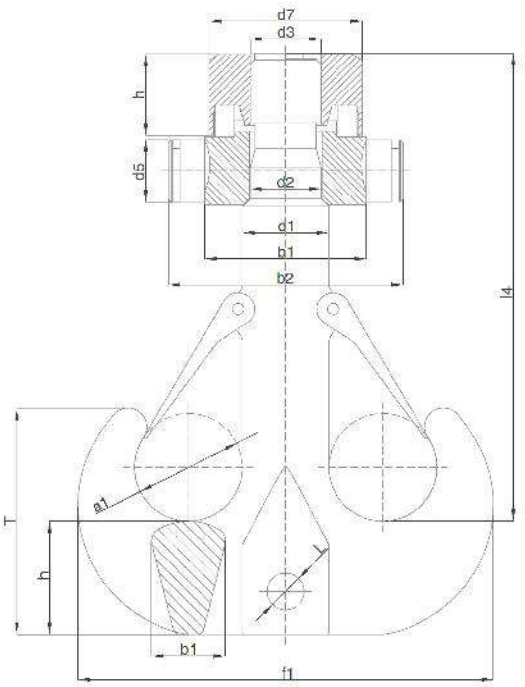
1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.2 RAMSHORN FORGED HOOKS BASED ON RECOGNIZED EUROPEAN STANDARDS

1.1.2.2 Ramshorn forged hooks based on BS3017:1980 design

1.1.2.2.2 Machined fitted with nut, crosshead and bearing



- WLL: from 5t to 1.000t (bottom hole excluded).
- Hook and Nut and Crosshead FORGED, HEAT TREATED and thread fully MACHINED as per DIN15403 design.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, S, T, V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

RAMSHORN FORGED HOOKS BASED ON BS3017:1980 I MACHINED FITTED WITH NUT, CROSSHEAD and BEARING

OVERALL DIMENSIONS (mm)											DIN 15412 Crosshead			DIN 15413 Nut		Weight
No	a1	d1	h	L	b1	T	f1	d2 h11	d3	l4	b1	b2	d5 h9	d7	h	kg
B10	95	76	100	33	65	200	366	64	Rd64x8	435	160	230	55	145	76	46
B15	108	83	108	40	70	219	412	64	Rd64x8	435	160	230	55	145	76	58
B20	120	102	117	46	76	238	458	80	Rd80x10	562	190	275	70	175	91	73
B25	133	114	132	46	86	267	510	90	Rd90x10	628	200	295	80	185	102	91
B30	145	121	144	56	94	291	556	100	Rd100x12	696	220	318	90	205	113	112
B35	153	127	156	56	101	313	584	100	Rd100x12	696	220	318	90	205	113	135
B40	162	133	162	59	105	329	616	110	Rd110x12	768	260	378	100	240	131	165
B45	170	140	175	59	114	351	654	110	Rd110x12	768	260	378	100	240	131	203
B50	178	146	181	65	118	365	684	110	Rd110x12	768	260	378	100	240	131	246
B60	191	152	200	65	130	400	732	125	Rd125x14	863	285	415	110	270	144	301
B70	202	159	210	75	136	425	792	125	Rd125x14	863	285	415	110	270	144	362
B80	211	165	225	75	147	452	812	125	Rd125x14	863	285	415	110	270	144	435
B100	229	178	251	84	163	498	882	140	Rd140x16	944	335	465	125	320	153	524
B120	242	191	273	90	177	540	946	160	Rd160x18	1072	380	522	140	360	181	626
B140	255	203	289	97	188	575	1004	160	Rd160x18	1072	380	522	140	360	181	753
B160	267	216	308	106	200	610	1054	180	Rd180x20	1212	420	565	160	400	198	897
B180	279	229	327	113	213	641	1118	180	Rd180x20	1212	420	565	160	400	198	1085
B200	287	241	346	116	225	679	1268	200	Rd200x22	1351	470	645	180	445	228	1275
B250	317	279	405	136	263	762	1308	225	Rd225x24	1522	510	685	200	490	246	1550
B300	343	305	422	141	274	804	1396	250	Rd250x28	1714	550	750	220	530	274	1850
B350	356	318	451	152	293	845	1474	250	Rd250x28	1714	550	750	220	530	274	2221
B400	381	343	479	161	311	899	1570	280	Rd280x32	1962	610	810	240	590	343	2668

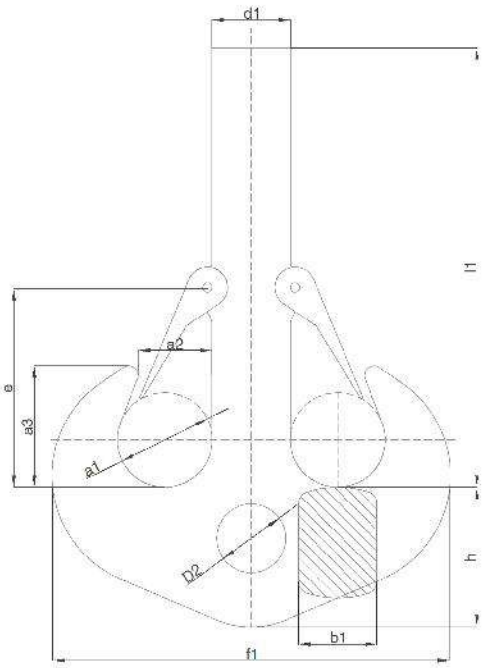
Tolerances: -0/+7% forging tolerance. Machining tolerances as per DIN15403.
Modifications: Shank length (L). Further dimensions upon request.
Hook section: b1xH: other sections can be design.

1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.2 RAMSHORN FORGED HOOKS BASED ON RECOGNIZED EUROPEAN STANDARDS

1.1.2.3 Ramshorn forged hooks based on DIN15402-B design

1.1.2.3.1 Unmachined



- WLL: from 10t to 2.000t (bottom hole included).
- Hook FORGED and HEAT TREATED. Machining recommended to perform by manufacturer.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, S, T, V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended after machining.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

RAMSHORN FORGED HOOKS BASED ON DIN15402-B DESIGN I UNMACHINED

	OVERALL DIMENSIONS (mm)										Weight
No	a1	a2	a3	b1	d1	D2 H15	e	f1	h	l1	Kg
10	90	71	116	75	75	74	192	377	130	450	41
12	100	80	130	85	85	78	210	421	150	510	57
16	112	90	146	95	95	86	237	471	170	580	82
20	125	100	163	106	106	96	265	531	190	650	115
25	140	112	182	118	118	106	315	598	212	715	160
32	160	125	205	132	132	116	335	672	236	790	229
40	180	140	230	150	150	131	375	754	265	885	330
50	200	160	260	170	170	146	420	842	300	965	458
63	224	180	292	190	190	168	460	944	335	1090	638
80	250	200	325	212	212	188	515	1062	375	1235	892
100	280	224	364	236	236	208	575	1186	425	1375	1248
125	315	250	408	265	265	235	645	1330	475	1550	1757
160	355	280	458	300	300	260	725	1505	530	1745	2500
200	400	315	515	335	335	282	800	1685	600	1960	3560
250	450	355	580	375	375	312	875	1885	670	2210	5033
320	500	400	650	425	425	340	950	2125	750	2490	7095
400	560	450	730	475	475	378	1045	2375	840	2805	10010

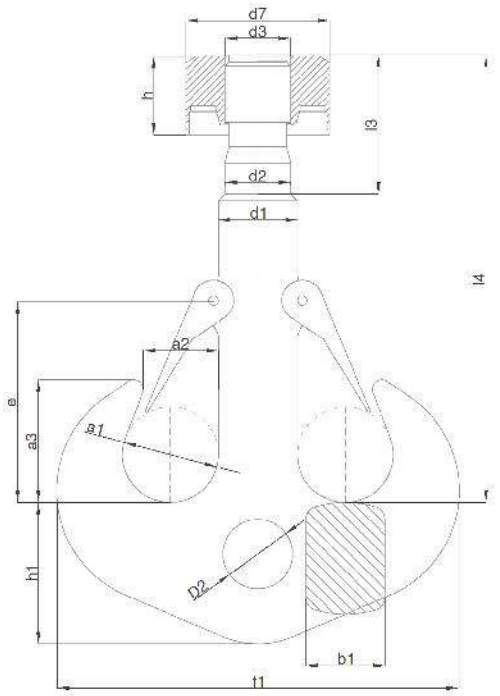
Tolerances: -0/+7% forging tolerance.
Modifications: Shank length (l). Further dimensions upon request.
Hook section: b1xH: other sections can be design.

1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.2 RAMSHORN FORGED HOOKS BASED ON RECOGNIZED EUROPEAN STANDARDS

1.1.2.3 Ramshorn forged hooks based on DIN15402-B design

1.1.2.3.2 Machined fitted with nut



- WLL: from 10t to 2.000t (bottom hole included).
- Hook and Nut FORGED, HEAT TREATED and thread fully MACHINED as per DIN15403 design.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, S, T, V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

RAMSHORN FORGED HOOKS BASED ON DIN15402-B DESIGN I MACHINED FITTED WITH NUT

OVERALL DIMENSIONS (mm)														DIN 15413 Nut		Weight
No	a1	a2	a3	b1	d1	e	f1	D2 H15	h1	d2 h11	d3	l3	l4	d7	h	kg
10	90	71	116	75	75	192	377	74	130	64	Rd64x8	135	435	145	76	47
12	100	80	130	85	85	210	421	78	150	72	Rd72x8	157	492	165	87	65,5
16	112	90	146	95	95	237	471	86	170	80	Rd80x10	170	562	175	91	92
20	125	100	163	106	106	265	531	96	190	90	Rd90x10	187	628	185	102	128
25	140	112	182	118	118	315	598	106	212	100	Rd100x12	207	696	205	113	177
32	160	125	205	132	132	335	672	116	236	110	Rd110x12	232	768	240	131	254
40	180	140	230	150	150	375	754	131	265	125	Rd125x14	257	863	270	144	368
50	200	160	260	170	170	420	842	146	300	140	Rd140x16	280	944	320	153	513
63	224	180	292	190	190	460	944	168	335	160	Rd160x18	322	1072	360	181	718
80	250	200	325	212	212	515	1062	188	375	180	Rd180x20	357	1212	400	198	1002
100	280	224	364	236	236	575	1186	208	425	200	Rd200x22	402	1351	445	228	1398
125	315	250	408	265	265	645	1330	235	475	225	Rd225x24	465	1522	490	246	1967
160	355	280	458	300	300	725	1505	260	530	250	Rd250x28	510	1714	530	274	2770
200	400	315	515	335	335	800	1685	282	600	280	Rd280x32	613	1962	590	343	3930
250	450	355	580	375	375	875	1885	312	670	320	Rd320x36	690	2217	680	383	5655
320	500	400	650	425	425	950	2125	340	750	370	Rd360x36	780	2505	760	433	8030
400	560	450	730	475	475	1045	2375	378	840	415	Rd400x36	875	2820	865	482	11472

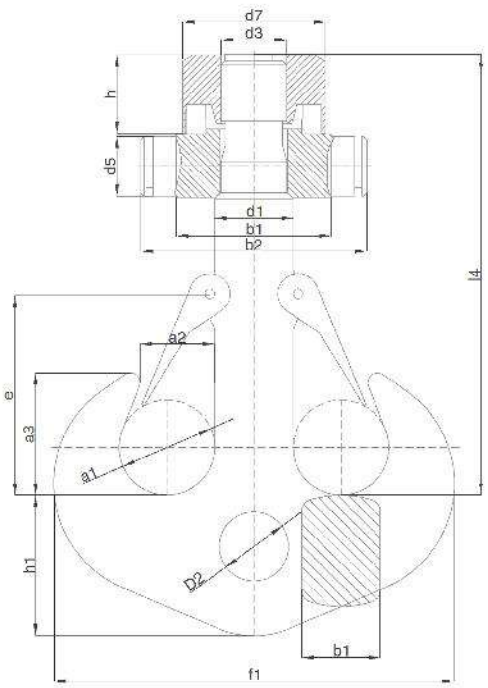
Tolerances: -0/+7% forging tolerance. Machining tolerances as per DIN15403.
Modifications: Shank length (L). Further dimensions upon request.
Hook section: b1xH: other sections can be design.

1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.2 RAMSHORN FORGED HOOKS BASED ON RECOGNIZED EUROPEAN STANDARDS

1.1.2.3 Ramshorn forged hooks based on DIN15402-B design

1.1.2.3.3 Machined fitted with nut, crosshead and bearing



- WLL: from 10t to 2.000t (bottom hole included).
- Hook, Nut and crosshead FORGED, HEAT TREATED and thread fully MACHINED as per DIN15403 design.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, S, T, V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

RAMSHORN FORGED HOOKS BASED ON DIN15402-B DESIGN I MACHINED FITTED WITH NUT, CROSSHEAD and BEARING

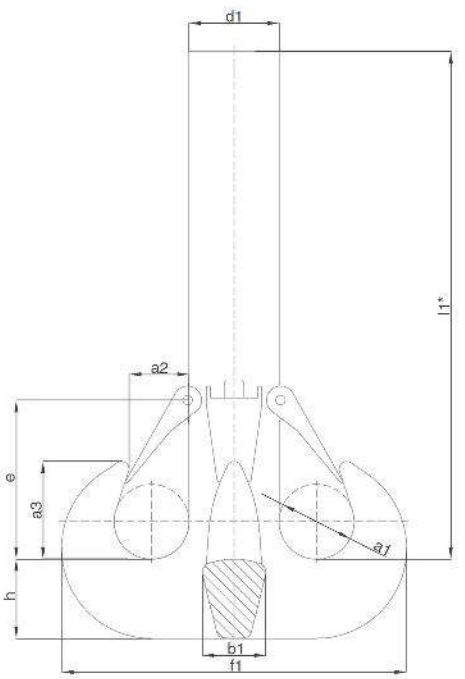
OVERALL DIMENSIONS (mm)												DIN 15412 Crosshead			DIN 15413 Nut		Weight
No	a1	a2	a3	b1	d1	e	f1	D2 H16	h1	d3	l4	b1	b2	d5 h9	d7	h	kg
10	90	71	116	75	75	192	377	74	130	Rd64x8	435	160	230	55	145	76	61,7
12	100	80	130	85	85	210	421	78	150	Rd72x8	492	180	265	60	165	87	87,5
16	112	90	146	95	95	237	471	86	170	Rd80x10	562	190	275	70	175	91	118,9
20	125	100	163	106	106	265	531	96	190	Rd90x10	628	200	295	80	185	102	161
25	140	112	182	118	118	315	598	106	212	Rd100x12	696	220	318	90	205	113	221,5
32	160	125	205	132	132	335	672	116	236	Rd110x12	768	260	378	100	240	131	323
40	180	140	230	150	150	375	754	131	265	Rd125x14	863	285	415	110	270	144	462
50	200	160	260	170	170	420	842	146	300	Rd140x16	944	335	465	125	320	153	656
63	224	180	292	190	190	460	944	168	335	Rd160x18	1072	380	522	140	360	181	921
80	250	200	325	212	212	515	1062	188	375	Rd180x20	1212	420	565	160	400	198	1281
100	280	224	364	236	236	575	1186	208	425	Rd200x22	1351	470	645	180	445	228	1788
125	315	250	408	265	265	645	1330	235	475	Rd225x24	1522	510	685	200	490	246	2496
160	355	280	458	300	300	725	1505	260	530	Rd250x28	1714	550	750	220	530	274	3485
200	400	315	515	335	335	800	1685	282	600	Rd280x32	1962	610	810	240	590	343	4911
250	450	355	580	375	375	875	1885	312	670	Rd320x36	2217	700	920	260	680	383	7037
320	500	400	650	425	425	950	2125	340	750	Rd360x36	2505	790	1030	280	760	433	9995
400	560	450	730	475	475	1045	2375	378	840	Rd400x36	2820	895	1145	300	865	482	14178

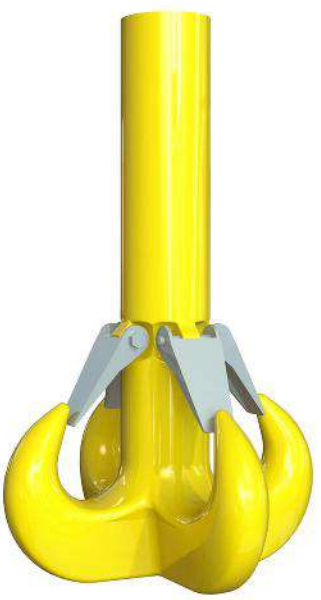
Tolerances: -0/+7% forging tolerance. Machining tolerances as per DIN15403.
Modifications: Shank length (L). Further dimensions upon request.
Hook section: b1xH: other sections can be design.

1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.3 QUAD FORGED HOOKS BASED ON DIN15402-C DESIGN

1.1.3.1 Unmachined





- WLL: from 160t to 4.000t with equal load on 4 prongs/horns.
- Hook FORGED and HEAT TREATED. Machining recommended to perform by manufacturer.
- Material: super alloys.
- Mechanical properties: V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended after machining.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

QUAD FORGED HOOKS BASED ON DIN15402-C I UNMACHINED

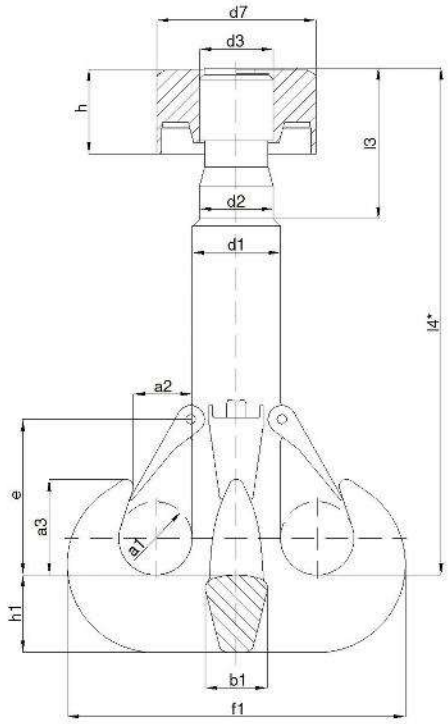
	OVERALL DIMENSIONS (mm)										Weight
No	WLL	a1	a2	a3	b1	d1	e	f1	h	l1*	kg
16	160t	112	90	146	95	132	237	508	118	790	154
20	200t	125	100	163	106	150	265	575	132	885	221
25	250t	140	112	182	118	170	315	650	150	965	312
32	320t	160	125	205	132	190	335	730	170	1090	440
40	400t	180	140	230	150	212	375	816	190	1235	624
50	500t	200	160	260	170	236	420	908	212	1375	868
63	640t	224	180	292	190	265	460	1019	236	1550	1231
80	800t	250	200	325	212	300	515	1150	265	1745	1751
100	1000t	280	224	364	236	335	575	1285	300	1998	2477
125	1260t	315	250	408	265	375	645	1440	335	2250	3490
160	1600t	355	280	458	300	425	725	1630	375	2550	5122
200	2000t	400	315	515	335	475	800	1825	425	2895	7158
250	2600t	450	355	580	375	550	875	2100	475	3270	10060
320	3200t	500	400	650	425	625	950	2390	530	3695	14140
400	4000t	560	450	730	475	725	1045	2775	600	4180	20450

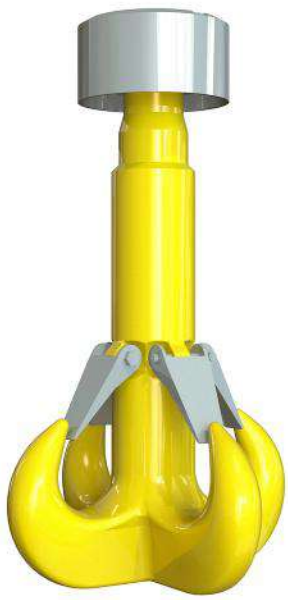
WLL based on V material grade.
Tolerances: -0/+7% forging tolerance.
Modifications: Shank length (L). Further dimensions upon request.
Hook section: b1xH: other sections can be design.

1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.3 QUAD FORGED HOOKS BASED ON DIN15402-C DESIGN

1.1.3.2 Machined fitted with nut





- WLL: from 160t to 4.000t with equal load on 4 prongs/horns.
- Hook and Nut FORGED, HEAT TREATED and thread fully MACHINED as per DIN15403 design.
- Material: super alloys.
- Mechanical properties: V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

QUAD FORGED HOOKS BASED ON DIN15402-C I MACHINED FITTED WITH NUT

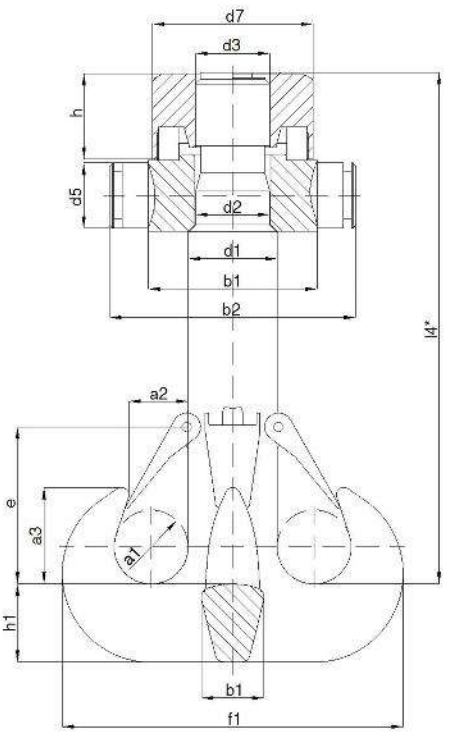
	OVERALL DIMENSIONS (mm)													DIN 15413 Nut		Weight
No	WLL	a1	a2	a3	b1	d1	e	f1	h1	d2 h11	d3	l3	l4*	d7	h	kg
16	160t	112	90	146	95	132	237	508	118	110	Rd110x12	232	768	240	131	168
20	200t	125	100	163	106	150	265	575	132	125	Rd125x14	257	863	270	144	241
25	250t	140	112	182	118	170	315	650	150	140	Rd140x16	280	944	320	153	342
32	320t	160	125	205	132	190	335	730	170	160	Rd160x18	322	1072	360	181	490
40	400t	180	140	230	150	212	375	816	190	180	Rd180x20	357	1212	400	198	743
50	500t	200	160	260	170	236	420	908	212	200	Rd200x22	402	1351	445	228	958
63	640t	224	180	292	190	265	460	1019	236	225	Rd225x24	465	1522	490	246	1348
80	800t	250	200	325	212	300	515	1150	265	250	Rd250x28	510	1714	530	274	1879
100	1000t	280	224	364	236	335	575	1285	300	280	Rd280x32	613	1962	590	343	2648
125	1260t	315	250	408	265	375	645	1440	335	320	Rd320x36	690	2217	680	383	3725
160	1600t	355	280	458	300	425	725	1630	375	370	Rd360x36	780	2505	760	433	5228
200	2000t	400	315	515	335	475	800	1825	425	415	Rd400x36	875	2820	865	482	7420
250	2600t	450	355	580	375	550	875	2100	475	480	Rd480x36	985	3175	975	540	10465
320	3200t	500	400	650	425	625	950	2390	530	550	Rd550x36	1110	3570	1090	600	14790
400	4000t	560	450	730	475	725	1045	2775	600	640	Rd640x36	1250	4020	1220	670	21240

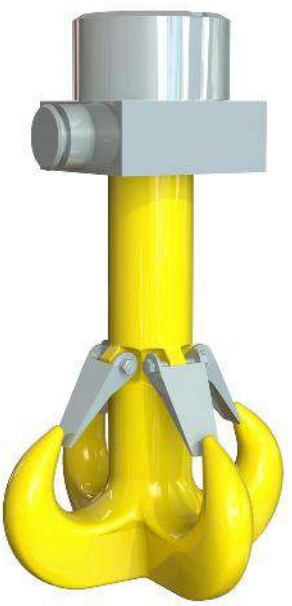
WLL based on V material grade.
Tolerances: -0/+7% forging tolerance. Machining tolerances as per DIN15403.
Modifications: Shank length (L). Further dimensions upon request.
Hook section: b1xH: other sections can be design.

1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.3 QUAD FORGED HOOKS BASED ON DIN15402-C DESIGN

1.1.3.2 Machined fitted with nut, crosshead and bearing





- WLL: from 160t to 4.000t with equal load on 4 prongs/horns.
- Hook, nut and crosshead FORGED, HEAT TREATED and thread fully MACHINED as per DIN15403 design.
- Material: super alloys.
- Mechanical properties: V, W.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

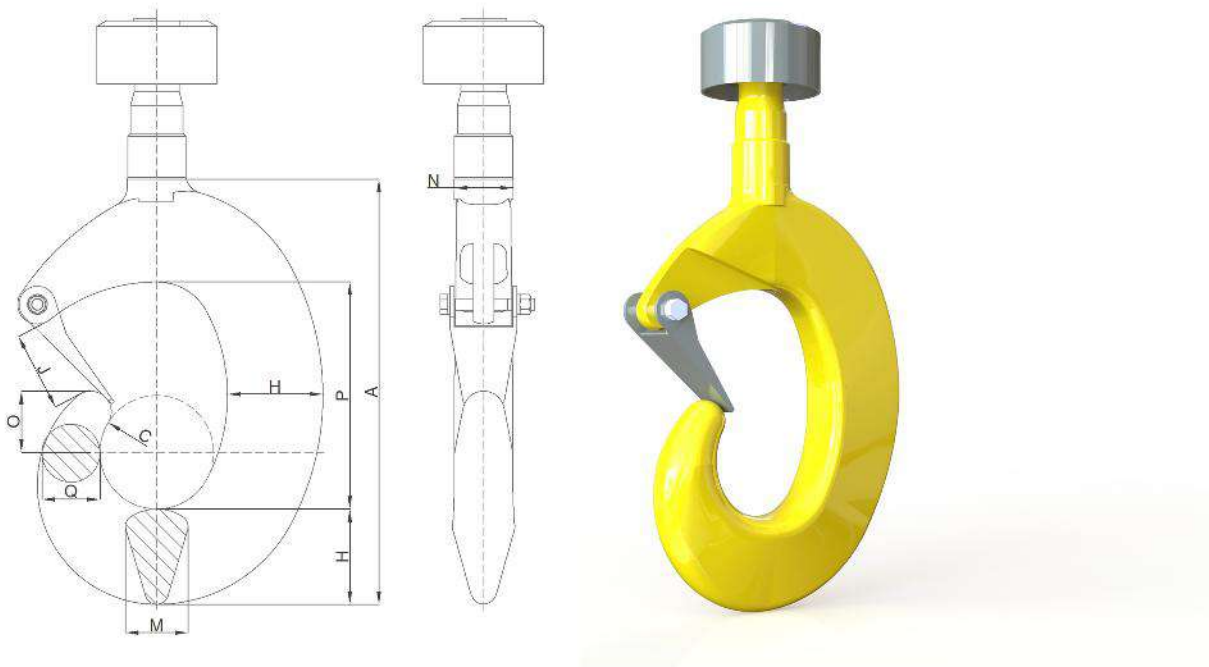
QUAD FORGED HOOKS BASED ON DIN15402-C I MACHINED FITTED WITH NUT, CROSSHEAD and BEARING

OVERALL DIMENSIONS (mm)													DIN 15412 Crosshead			DIN 15413 Nut		Weight
No	WLL	a1	a2	a3	b1	d1	e	f1	h1	d2 h11	d3	l4*	b1	b2	d5 h9	d7	h	kg
16	160t	112	90	146	95	132	237	508	118	110	Rd110x12	768	260	378	100	240	131	231
20	200t	125	100	163	106	150	265	575	132	125	Rd125x14	863	285	415	110	270	144	325
25	250t	140	112	182	118	170	315	650	150	140	Rd140x16	944	335	465	125	320	153	472
32	320t	160	125	205	132	190	335	730	170	160	Rd160x18	1072	380	522	140	360	181	679
40	400t	180	140	230	150	212	375	816	190	180	Rd180x20	1212	420	565	160	400	198	1106
50	500t	200	160	260	170	236	420	908	212	200	Rd200x22	1351	470	645	180	445	228	1321
63	640t	224	180	292	190	265	460	1019	236	225	Rd225x24	1522	510	685	200	490	246	1838
80	800t	250	200	325	212	300	515	1150	265	250	Rd250x28	1714	550	750	220	530	274	2523
100	1000t	280	224	364	236	335	575	1285	300	280	Rd280x32	1962	610	810	240	590	343	3598
125	1260t	315	250	408	265	375	645	1440	335	320	Rd320x36	2217	700	920	260	680	383	5115
160	1600t	355	280	458	300	425	725	1630	375	370	Rd360x36	2505	790	1030	280	760	433	7220
200	2000t	400	315	515	335	475	800	1825	425	415	Rd400x36	2820	895	1145	300	865	482	10195
250	2600t	450	355	580	375	550	875	2100	475	480	Rd480x36	3175	1005	1265	320	975	540	14475
320	3200t	500	400	650	425	625	950	2390	530	550	Rd550x36	3570	1110	1390	345	1090	600	20410
400	4000t	560	450	730	475	725	1045	2775	600	640	Rd640x36	4020	1225	1520	370	1220	670	29100

WLL based on V material grade.
Tolerances: -0/+7% forging tolerance. Machining tolerances as per DIN15403.
Modifications: Shank length (L). Further dimensions upon request.
Hook section: b1xH: other sections can be design.

1.1 SHANK HOOKS BASED ON EN13001-3-5:2016

1.1.4 SINGLE FORGED CARGO HOOKS BASED ON BS2903:1980 DESIGN.



- WLL: from 10t to 50t. Larger ones upon request.
- Hook FORGED and HEAT TREATED.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, V.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

SINGLE FORGED CARGO HOOKS BASED ON BS2903:1980 DESIGN

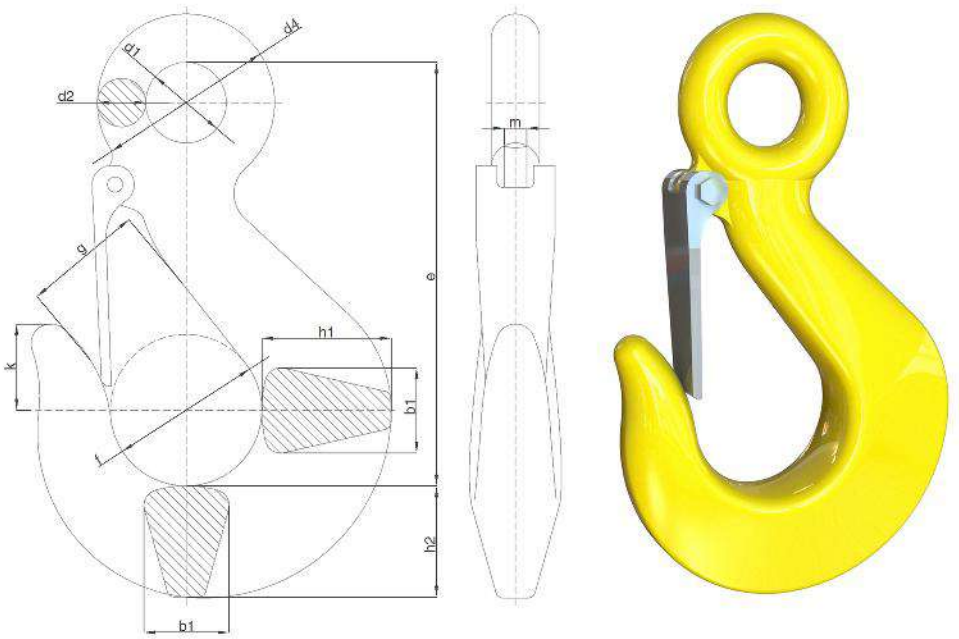
		OVERALL DIMENSIONS (mm)									Weight
No	WLL (t)	C	A	P	H	J	M	O	Q	N	Kg
5	10	70	258	140	59	50	38	38	35	41	5,5
6,3	13	78	287	156	66	55	43	42	39	46	8
8	16	88	324	176	74	62	48	48	44	51	11
10	20	98	361	196	82	70	54	53	49	56	15
12,5	25	110	405	220	92	78	60	59	55	61	22
16	32	124	456	248	104	88	68	67	62	66	32
20	40	139	512	278	117	99	76	75	70	76	45
25	50	156	574	312	131	111	86	84	78	81	63

WLL: for V material grade.
Tolerances: -0/+7% forging tolerance.
Modifications: Upon request.

1.2 EYE HOOKS

1.2.1 EYE FORGED SINGLE HOOKS BASED ON RECOGNIZED EUROPEAN DESIGNS & IRIZAR DESIGNS

1.2.1.1 Eye forged single CHAIN hook based on DIN7540 design



- WLL: from 3t to 400t (for super alloy materials).
- Hook FORGED and HEAT TREATED.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, V.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

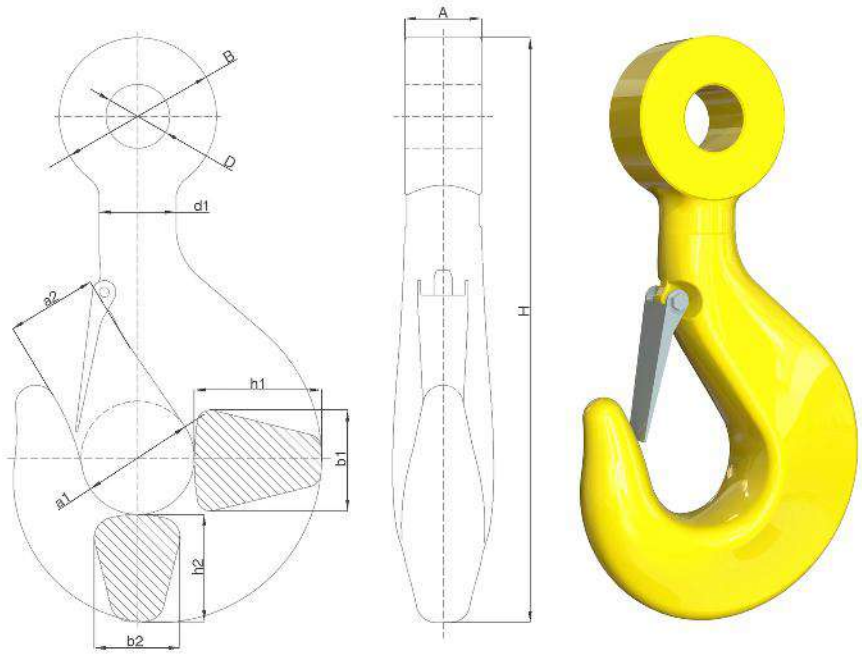
EYE FORGED SINGLE CHAIN HOOK BASED ON DIN7540 DESIGN													
	OVERALL DIMENSIONS (mm)												Weight
No	WLL (t)	b1	d1	d2	e	f	g	h1	h2	k	m	d4	Kg
25	5	28	26	16	138	50	39	42,5	36,5	28,5	11	58	1,4
27	8	35	32	20	174	62	49	53,5	46	36	12	72	2,6
28	10	40	36	22,5	190	70	54	60	52	36	14	81	3,9
29	12,5	44,5	40	25	219	79	62	67,5	58	45	16	90	5,7
30	16	49,5	46	28	246	88	69	75	65	50	17	102	8
31	20	56	52	31,5	277	99	78	84,5	73	57	18	115	11,5
32	25	63	60	35,5	313	112	88	96	82,5	64	18	131	16
33	32	70	66	40	349	125	98	106	92	72	19	146	22
34	40	78	72	44,5	388	140	109	118	103	80	20	161	31,5
35	50	89	84	50,5	442	158	124	135	116	90	23	185	46
36	63	99	90	56	494	176	138	151	130	101	25	202	63
37	80	110	102	63	610	198	155	168	145	113	30	228	80
38	100	125	116	74	650	225	175	195	172	133	38	264	125
39	150	160	130	86	765	250	200	225	199	160	38	302	250
40	200	180	150	102	850	275	225	260	237	195	45	354	365
41	250	200	170	120	928	310	255	290	269	210	45	410	515
42	300	220	190	140	1052	350	290	330	309,5	240	45	470	730
43	400	240	210	170	1195	400	320	380	345	270	45	550	1055

WLL: for V material grade.
Tolerances: -0/+7% forging tolerance.
Modifications: Modifications upon request.

1.2 EYE HOOKS

1.2.1 EYE FORGED SINGLE HOOKS BASED ON RECOGNIZED EUROPEAN DESIGNS & IRIZAR DESIGNS

1.2.1.2 Eye forged single FIX hook based on IRIZAR DESIGN



- WLL: from 80t to 2.000t. Larger ones upon request.
- Hook FORGED and HEAT TREATED.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, V.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

EYE FORGED SINGLE FIX HOOK BASED ON IRIZAR DESIGN

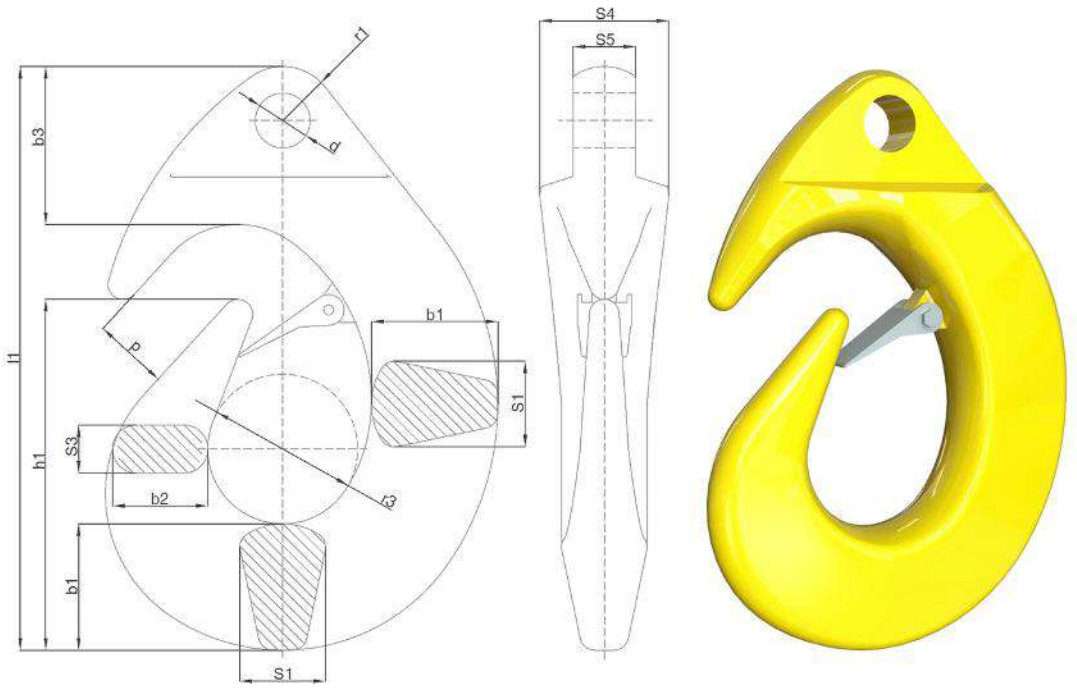
			OVERALL DIMENSIONS (mm)											Weight
No	WLL (t)	MBL (t)	a1	a2	b1	b2	h1	h2	d1	A	D	B	H	kg
16	80	320	140	112	125	106	160	132	95	110	87	180	746	96
20	100	400	160	125	140	118	180	150	106	118	100	210	812	137
25	120	480	180	140	160	132	200	170	118	134	100	210	927	190
32	150	600	200	160	180	150	224	190	132	140	114	240	1052	272
40	200	800	224	180	200	170	250	212	150	150	137	290	1201	397
50	250	1000	250	200	224	190	280	236	170	170	147	310	1314	544
63	300	1200	280	224	250	212	315	265	190	190	158	330	1448	730
80	400	1600	315	250	280	236	355	300	212	205	184	380	1685	1079
100	500	2000	355	280	315	265	400	335	236	230	194	400	1871	1487
125	600	2400	400	315	355	300	450	375	265	255	215	450	2075	2090
160	800	3200	450	355	400	335	500	425	300	280	240	500	2294	2902
200	1000	4000	500	400	450	375	560	475	335	320	280	580	2450	4079
250	1250	5000	560	450	500	425	630	530	375	355	315	650	2810	5707
320	1550	6200	630	500	560	475	710	580	425	355	335	680	3060	7697
400	1800	7200	710	560	630	530	800	630	475	410	395	750	3430	10840

WLL: for V material grade.
Tolerances: -0/+7% forging tolerance.
Modifications: H, D and A. Others upon request.

1.2 EYE HOOKS

1.2.1 EYE FORGED SINGLE HOOKS BASED ON RECOGNIZED EUROPEAN DESIGNS & IRIZAR DESIGNS

1.2.1.3 Eye forged single CARGO hook based on DIN82017 design



- WLL: from 10t to 100t. Larger ones upon request.
- Hook FORGED and HEAT TREATED.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, V.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

EYE FORGED SINGLE CARGO HOOK BASED ON DIN82017 DESIGN

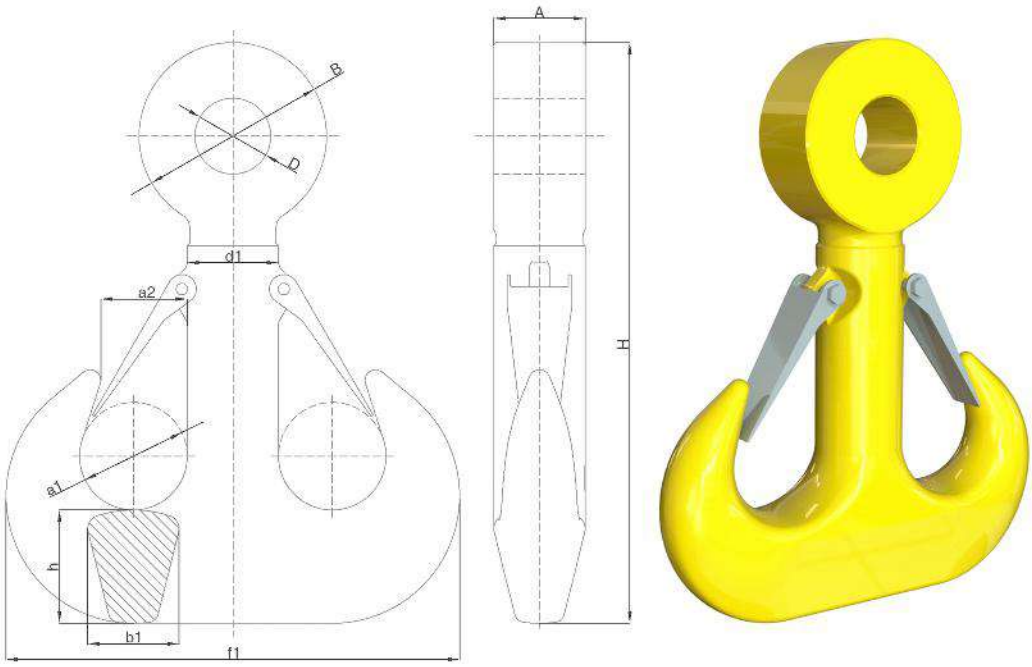
	OVERALL DIMENSIONS (mm)														Weight
No	WLL (t)	b1	b2	b3	d	h1	l1	p	r1	r3	S1	S3	S4	S5 A	S5 B	Kg
1	2	42	33	50	17,5	117	192	25	18	25	28	16	40	19	16	3
2	4	54	42	69	24	150	251	32	25	32	36	20	58	27	22	7
3	6	68	53	82	30	188	310	40	30	40	46	26	72	35	28	11
5	10	84	66	103	39	234	387	50	38	50	56	32	92	44	35	20
6	12	94	73	114	42	262	432	56	43	56	64	36	102	50	40	27
8	16	106	83	129	48	295	487	63	48	63	72	40	115	56	45	38
10	20	118	92	150	52	328	548	70	55	70	80	45	125	61	50	59
12	24	135	105	172	56	375	627	80	60	80	91	51	138	68	55	78
16	32	152	114	190	66	422	702	90	65	90	103	58	155	75	60	118
20	40	170	133	202	74	470	772	100	70	100	115	64	172	84	65	166
25	50	190	153	220	78	522	852	110	75	110	128	72	192	94	70	250
32	65	203	167	246	86	562	928	120	85	120	137	77	204	102	80	390
40	80	225	189	272	96	618	1020	130	95	130	152	85	225	117	90	610

WLL: for V material grade.
Tolerances: -0/+7% forging tolerance.
Modifications: H, D and A. Others upon request.

1.2 EYE HOOKS

1.2.2 EYE FORGED RAMSHORN HOOKS BASED ON RECOGNIZED EUROPEAN DESIGNS & IRIZAR DESIGNS

1.2.2.1 Eye forged Ramshorn FIX hook based on IRIZAR design



- WLL: from 80t to 2.000t. Larger ones upon request.
- Hook FORGED and HEAT TREATED.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, V.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

EYE FORGED RAMSHORN FIX HOOK BASED ON IRIZAR DESIGN

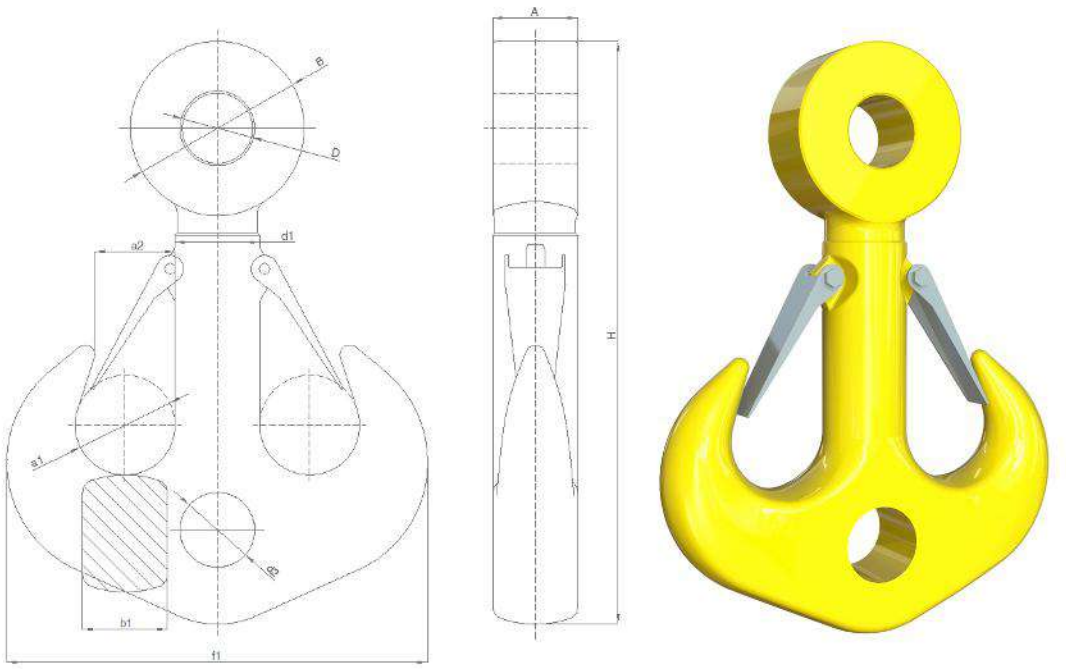
			OVERALL DIMENSIONS (mm)										Weight
No	WLL (t)	MBL (t)	a1	a2	b1	h	d1	f1	A	D	B	H	kg
16	80	320	112	90	95	118	95	471	110	87	180	625	77
20	100	400	125	100	106	132	106	531	118	100	210	713	113
25	120	480	140	112	118	150	118	598	134	100	210	799	153
32	150	600	160	125	132	170	132	672	140	114	240	872	213
40	200	800	180	140	150	190	150	754	150	137	290	1004	321
50	250	1000	200	160	170	212	170	842	170	147	310	1112	442
63	300	1200	224	180	190	236	190	944	190	158	330	1210	586
80	400	1600	250	200	212	265	212	1062	205	184	380	1408	870
100	500	2000	280	224	236	300	236	1186	230	194	400	1536	1174
125	600	2400	315	250	265	335	265	1330	255	215	450	1708	1646
160	800	3200	355	280	300	375	300	1505	280	240	500	1879	2289
200	1000	4000	400	315	335	425	335	1685	320	280	580	2125	3196
250	1250	5000	450	355	375	475	375	1885	355	315	650	2240	4490
320	1550	6200	500	400	425	530	425	2125	355	335	680	2390	6105
400	1800	7200	560	450	475	600	475	2375	410	395	750	2545	8725

WLL: for V material grade.
Tolerances: -0/+7% forging tolerance.
Modifications: H, D and A. Others upon request.

1.2 EYE HOOKS

1.2.2 EYE FORGED RAMSHORN HOOKS BASED ON RECOGNIZED EUROPEAN DESIGNS & IRIZAR DESIGNS

1.2.2.2 Eye forged Ramshorn B hook based on IRIZAR design



- WLL: from 80t to 2.000t (bottom hole included). Larger ones upon request.
- Hook FORGED and HEAT TREATED.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, V.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

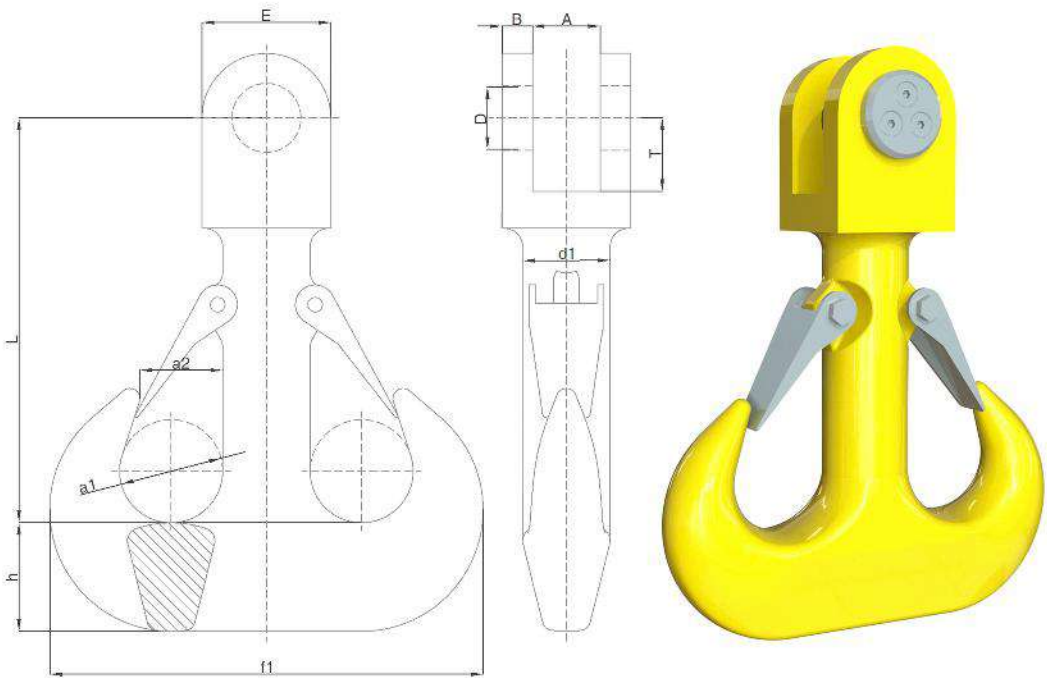
EYE FORGED RAMSHORN B HOOK BASED ON IRIZAR DESIGN													
			OVERALL DIMENSIONS (mm)										Weight
No	WLL (t)	MBL (t)	a1	a2	b1	d1	d2H15	f1	A	D	B	H	kg
16	80	320	112	90	95	95	86	471	110	87	180	678	84
20	100	400	125	100	106	106	96	531	118	100	210	771	125
25	120	480	140	112	118	118	106	598	134	100	210	862	169
32	150	600	160	125	132	132	116	672	140	114	240	938	236
40	200	800	180	140	150	150	131	754	150	137	290	1080	353
50	250	1000	200	160	170	170	146	842	170	147	310	1201	489
63	300	1200	224	180	190	190	168	944	190	158	330	1308	670
80	400	1600	250	200	212	212	188	1062	205	184	380	1518	1027
100	500	2000	280	224	236	236	208	1186	230	194	400	1660	1393
125	600	2400	315	250	265	265	235	1330	255	215	450	1848	1925
160	800	3200	355	280	300	300	260	1505	280	240	500	2034	2690
200	1000	4000	400	315	335	335	282	1685	320	280	580	2300	3830
250	1250	5000	450	355	375	375	312	1885	355	315	650	2553	5325
320	1550	6200	500	400	425	425	330	2125	355	335	680	2755	7510
400	1800	7200	560	450	475	475	370	2375	410	395	750	2980	10665

WLL: for V material grade.
Tolerances: -0/+7% forging tolerance.
Modifications: H, D and A. Others upon request.

1.2 EYE HOOKS

1.2.2 EYE FORGED RAMSHORN HOOKS BASED ON RECOGNIZED EUROPEAN DESIGNS & IRIZAR DESIGNS

1.2.2.3 Eye forged Ramshorn FORK hook based on DIN82019 design



- WLL: from 80t to 2.000t. Larger ones upon request.
- Hook FORGED and HEAT TREATED.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, V.
- Safety Factor: min. 4:1 with the highest material grade.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

EYE FORGED RAMSHORN FORK HOOK BASED ON DIN82019 DESIGN														
	OVERALL DIMENSIONS (mm)													Weight
No	WLL (t)	MBL	a1	a2	h	d1	f1	A	B	D	L	E	T	kg
16	80	320	112	90	118	95	471	120	70	80	490	155	120	85
20	100	400	125	100	132	106	531	135	80	85	550	170	125	126
25	120	480	140	112	150	118	598	150	89	95	624	200	142	172
32	150	600	160	125	170	132	672	170	102	110	720	230	165	240
40	200	800	180	140	190	150	754	180	120	125	815	260	185	360
50	250	1000	200	160	212	170	842	205	125	140	900	260	210	495
63	300	1200	224	180	236	190	944	205	130	150	1005	305	225	656
80	400	1600	250	200	265	212	1062	230	165	175	1130	350	260	975
100	500	2000	280	224	300	236	1186	255	180	185	1260	370	275	1315
125	600	2400	315	250	335	265	1330	285	195	205	1390	405	300	1845
160	800	3200	355	280	375	300	1505	310	210	215	1525	435	320	2565
200	1000	4000	400	315	425	335	1685	350	230	240	1660	480	360	3580
250	1250	5000	450	355	475	375	1885	370	278	270	1815	590	405	5030
320	1550	6200	500	400	530	425	2125	370	280	290	1980	610	435	6838
400	1800	7200	560	450	600	475	2375	430	300	330	2375	660	495	9775

WLL: for V material grade.
Tolerances: -0/+7% forging tolerance.
Modifications: r5, b2 and b4. Others upon request.

1.3 CUSTOM HOOKS

FORGED HEAVY DUTY HOOKS

IRIZAR FORGE team can accommodate any forged hook to the specific lifting operation the market is ready to operate **up to 4.000t**, from safety, design, material strength and certification point of view.

- WLL: up to 4.000t.
- Hook FORGED and HEAT TREATED, fully machined and fitted & assembled.
- Material: carbon, alloys and super alloys. Stainless steels available upon request.
- Mechanical properties: P, T, V.
- Safety Factor: min. 4:1 with the highest material grade.
- General Tolerances: -0/+7% forged parts and Machining tolerances as per DIN15403.
- Load Test: requested / recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

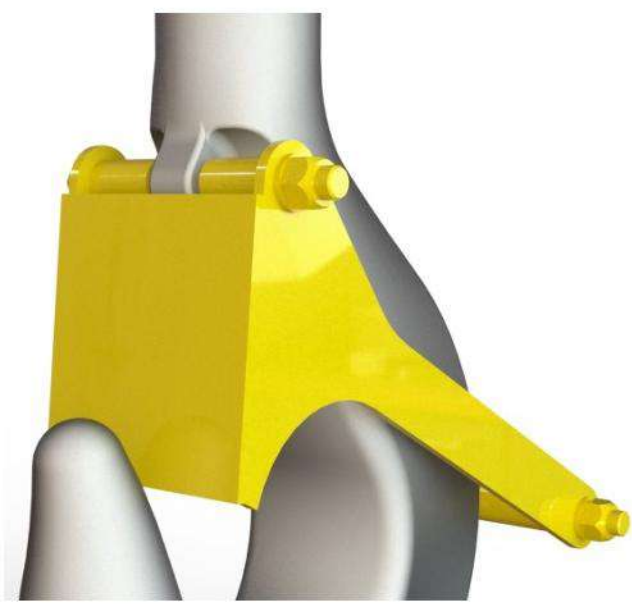
1.4 VARIETY OF SAFETY LATCHES FOR CRANE HOOKS

1.4.1 STANDARD LATCH

- Material: carbon & stainless steels.
- Suitable for: Single & Ramshorn hooks.
- Test: FAT upon request.

1.4.2 GRAVITY LATCH

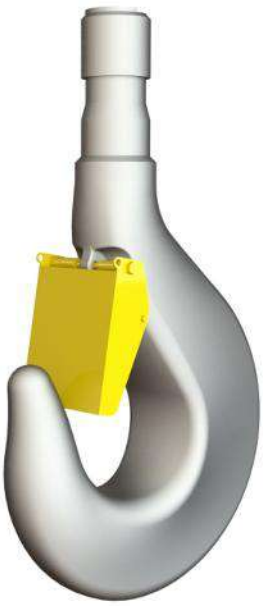
- Material: carbon & stainless steels.
- Suitable for: Single hooks only.
- Test: FAT upon request.

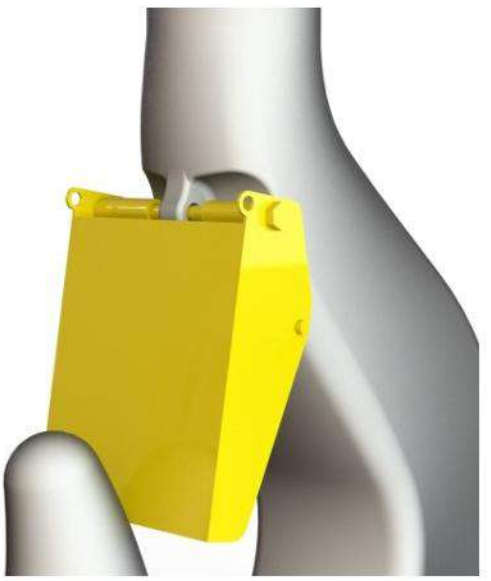


1.4 VARIETY OF SAFETY LATCHES FOR CRANE HOOKS

1.4.3 LOCKING LATCH

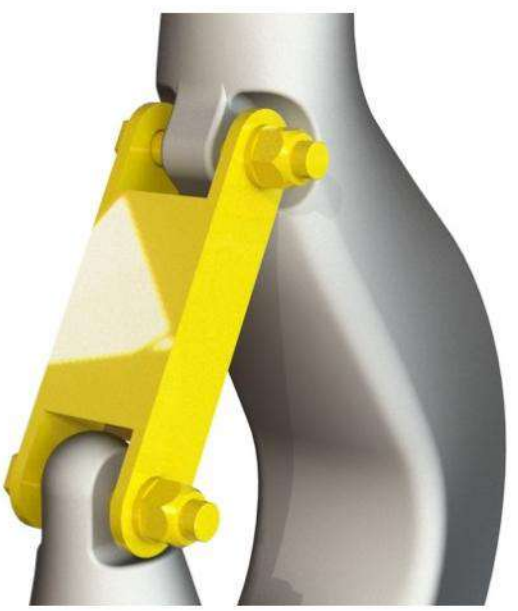
- Material: carbon & stainless steels.
- Suitable for: Single & Ramshorn hooks.
- Test: FAT upon request.





1.4.4 FIX LATCH

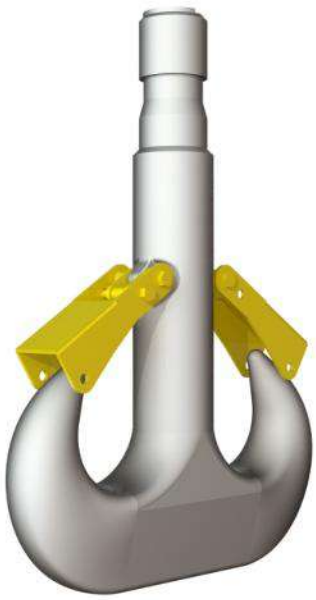
- Material: carbon & stainless steels.
- Suitable for: Single & Ramshorn hooks.
- Test: FAT upon request.

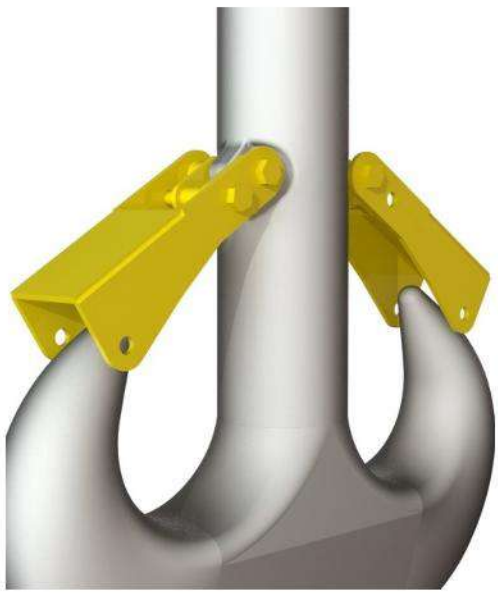


1.4 VARIETY OF SAFETY LATCHES FOR CRANE HOOKS

1.4.5 SUBSEA LATCH

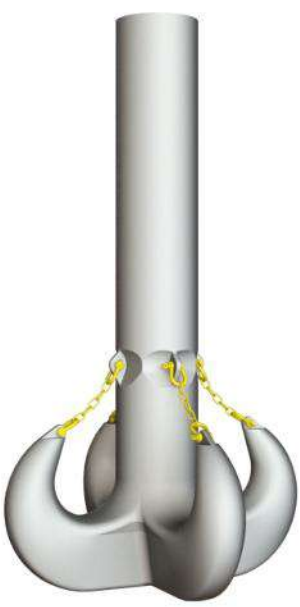
- Material: carbon & stainless steels.
- Suitable for: Single & Ramshorn hooks.
- Test: FAT upon request.

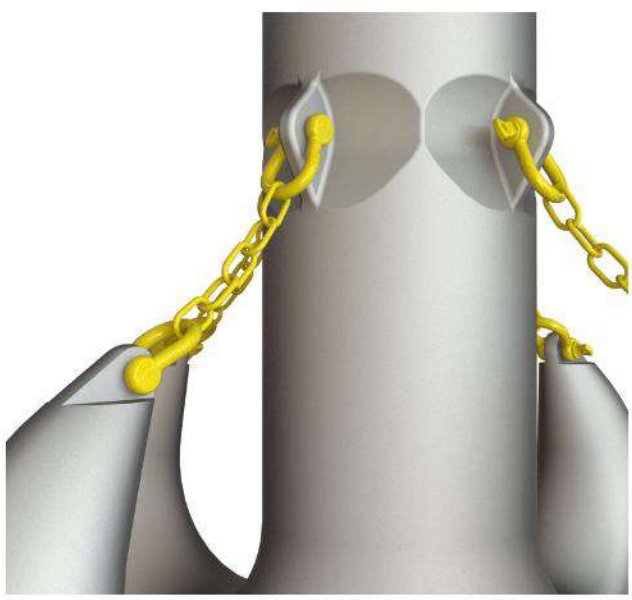




1.4.6 CHAIN LATCH

- Material: carbon & stainless steels.
- Suitable for: Quad & Ramshorn hooks.
- Test: FAT upon request.





CRANE BLOCKS

2.0 INTRO

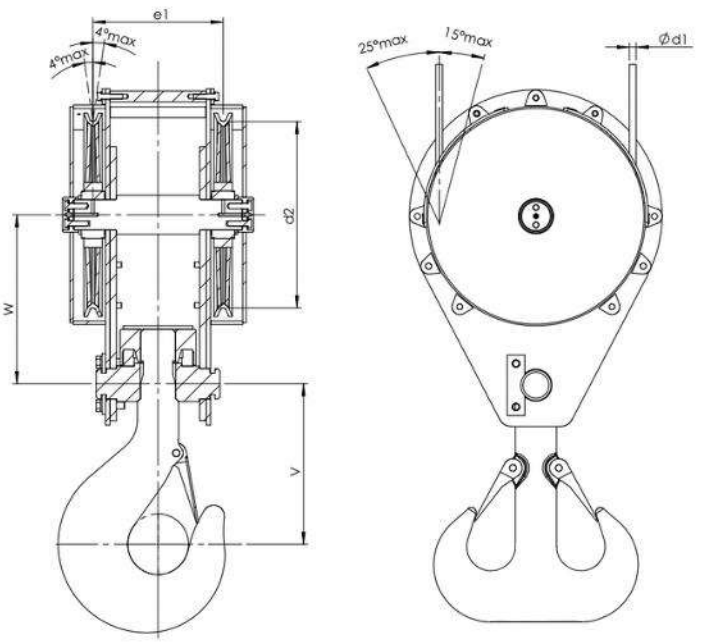
Crane block or Hook block is considered the complete component of the hoist and it's linked to the crane by the rope pulleys/ sheaves though the rope.

Its design depends on the crane purpose an concept design whereas rope pulleys or sheaves and hook assembly design will be the key factor to achieve customer requirements and expectations. Using the previous pages for the right hook selection, sheaves must keep a proportional relation and must be symetric to the gravity center of the Crane Block.

Last decades sheaves diameter has been decreased thanks to wire ropes advanced technology using more flexible wire ropes, reducing rope diameter and increasing strengthness thanks to very advanced materials, having decreased the historical factor (rope diameter (d1) x factor=sheave diameter (D). Please see Chapter 7, ROPE ACCESSORIES/SHEAVES.

The number of sheaves in the Hook Block will depend on the total WLL of the Hook Block and individual sheave WLL: falls is called to the twisted rope, whereas 1 sheave has always 2 falls, 2 sheaves have 4 falls...

The fall must have a certain angle for safety reasons: regularly the maximum angle is regulated by International Standards, being the most popular ones as shown below:



Modern Hook Block designs they need to respond to latest customer demands as:

* Easy to dissassemble to exchange hook type and replace inner components and accessories as bearings and sheaves.
* Easy to grease it during maintenance, in order to keep all turning parts lubricated.

Proof Test Load (PTL) is being performed at IRIZAR benches in order to cover a full guarantee to the crane operator.

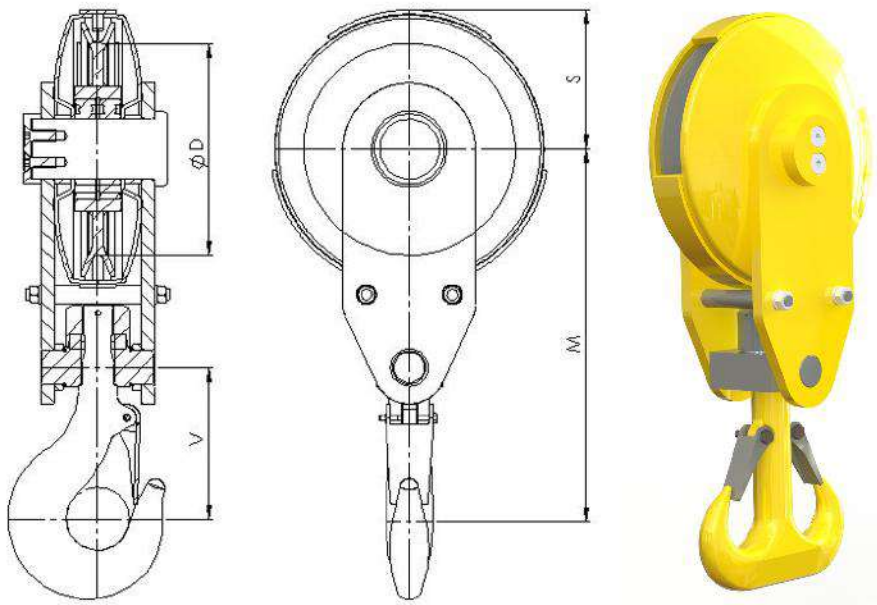
Complete Maintenance Manual is being delivered to the customer full of recommendations and good practices from the original manufacturer for a safe and long lifetime component.

Enjoy CRANE BLOCK RANGE in the following pages.

2.1 OVERHEAD/GANTRY CRANE BLOCKS

2.1.1 LIGHT DUTY BLOCKS

2.1.1.1 One Sheave Block

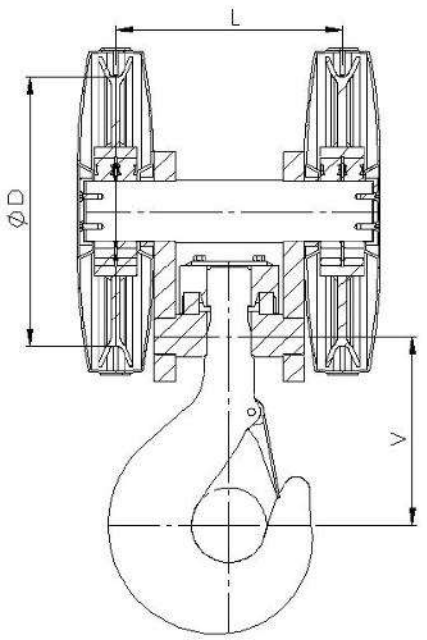


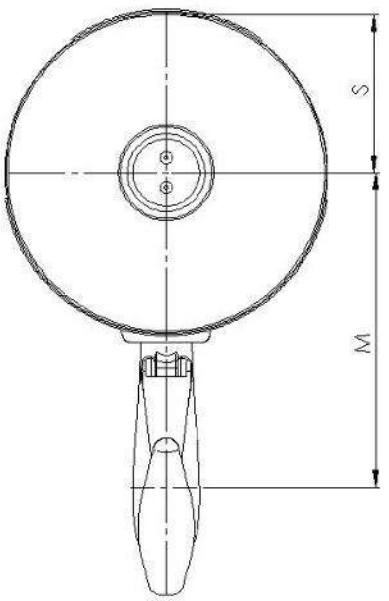
- WLL: from 2t to 32t.
- Hook: Single or Ramshorn. FORGED and HEAT TREATED fully MACHINED with nut & crosshead. Max size: 8 acc to DIN15400. Material grades: carbon (P) or alloy (T).
- Sheave: 1 (2 falls). Cold Laminated or Technical Plastic. Max size 450mm (inner diameter).
- Bearing: axial for hook assembly + roller/ball for sheaves.
- Coating Protection: fully painted inside & outside.
- Certificate: EN10204-2.1. Load Test & FAT upon request.

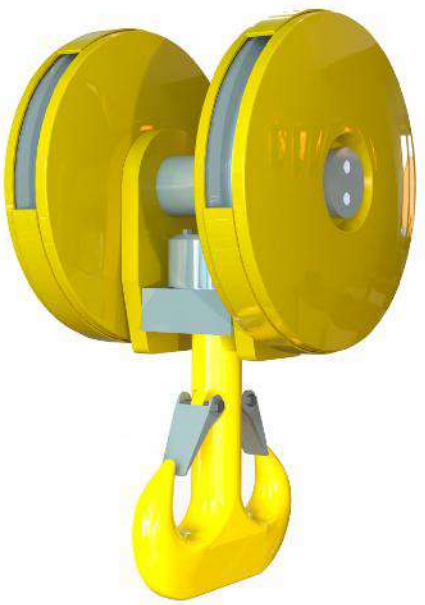
2.1 OVERHEAD/GANTRY CRANE BLOCKS

2.1.1 LIGHT DUTY BLOCKS

2.1.1.2 Two Sheaves Block







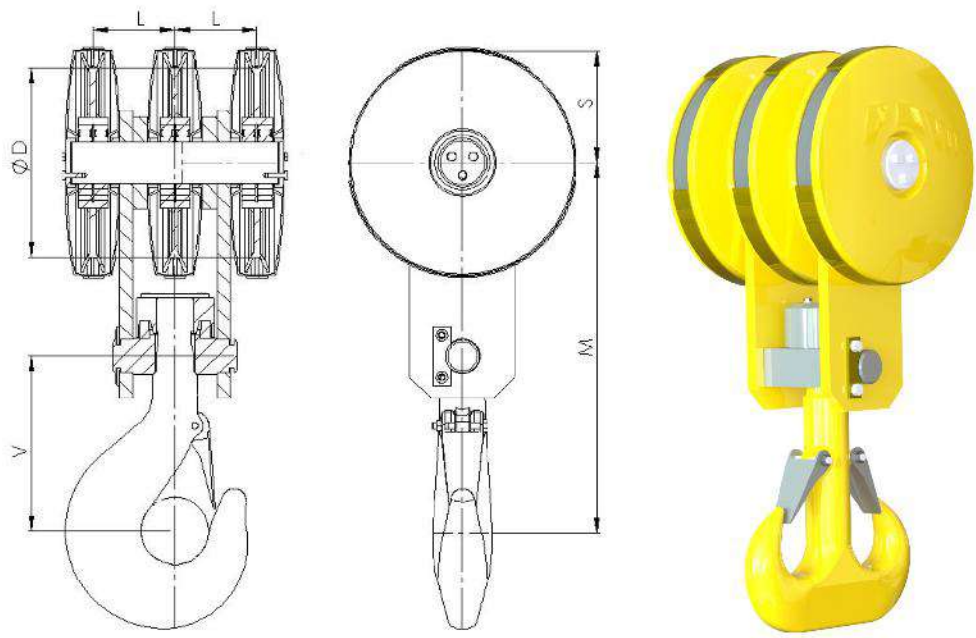
- WLL: from 4t to 64t.
- Hook: Single or Ramshorn. FORGED and HEAT TREATED fully MACHINED with nut & crosshead. Max size: 16 acc to DIN15400. Material grades: carbon (P) or alloy (T).
- Sheave: 2 (4 falls). Cold Laminated or Technical Plastic. Max size 450mm (inner diameter).
- Bearing: axial for hook assembly + roller/ball for sheaves.
- Coating Protection: fully painted inside & outside.
- Certificate: EN10204-2.1. Load Test & FAT upon request.

LIGHT DUTY BLOCKS I TWO SHEAVES BLOCK									
OVERALL DIMENSIONS (mm)							WLL(t) 1Bm/M3		Weight
Hook No	Wire rope (mm)	SHEAVE ØD	L	V	M	S	P	T	Kg
1,6	7	160	162	140	240	105	4	6,3	18
2,5	10	200	194	155	265	131	6,3	10	30
4	15	280	222	175	320	180	10	16	60
5	15	280	242	195	335	180	12,5	20	66
6	16	355	302	240	415	223	16	25	131
8	16	355	327	265	435	223	20	32	142
10	22	450	349	280	490	274	25	40	226
12	22	450	379	315	525	274	32	50	257
16	22	450	389	370	590	274	40	63	286

2.1 OVERHEAD/GANTRY CRANE BLOCKS

2.1.1 LIGHT DUTY BLOCKS

2.1.1.3 Three Sheaves Block



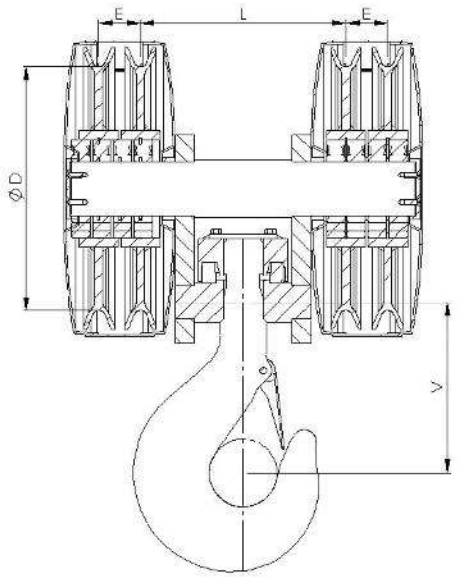
- WLL: from 20t to 80t.
- Hook: Single or Ramshorn. FORGED and HEAT TREATED fully MACHINED with nut & crosshead. Max size: 20 acc to DIN15400. Material grades: carbon (P) or alloy (T).
- Sheave: 3 (6 falls). Cold Laminated or Technical Plastic. Max size 450mm (inner diameter).
- Bearing: axial for hook assembly + roller/ball for sheaves.
- Coating Protection: fully painted inside & outside.
- Certificate: EN10204-2.1. Load Test & FAT upon request.

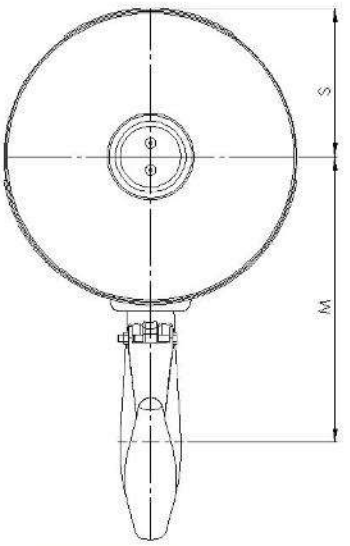
LIGHT DUTY BLOCKS I THREE SHEAVES BLOCK									
OVERALL DIMENSIONS (mm)							WLL(t) 1Bm/M3		Weight
Hook No	Wire rope (mm)	SHEAVE ØD	L	V	M	S	P	T	Kg
8	16	355	159	265	650	223	20	32	170
20	22	450	194,5	415	875	274	50	80	436

2.1 OVERHEAD/GANTRY CRANE BLOCKS

2.1.1 LIGHT DUTY BLOCKS

2.1.1.4 Four Sheaves Block





- WLL: from 6t to 100t.
- Hook: Single or Ramshorn. FORGED and HEAT TREATED fully MACHINED with nut & crosshead. Max size: 25 acc to DIN15400. Material grades: carbon (P) or alloy (T).
- Sheave: 4 (8 falls). Cold Laminated or Technical Plastic. Max size 450mm (inner diameter).
- Bearing: axial for hook assembly + roller/ball for sheaves.
- Coating Protection: fully painted inside & outside.
- Certificate: EN10204-2.1. Load Test & FAT upon request.

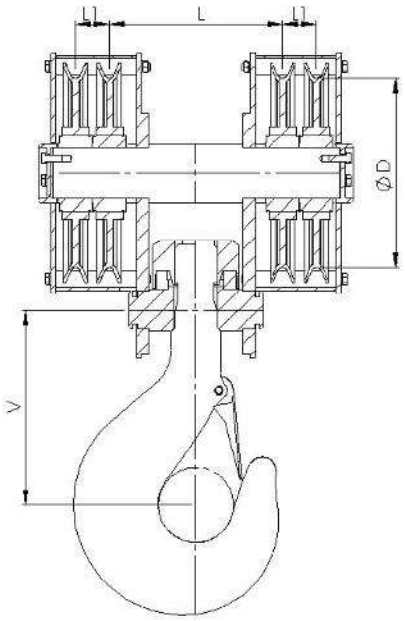
LIGHT DUTY BLOCKS I FOUR SHEAVES BLOCK

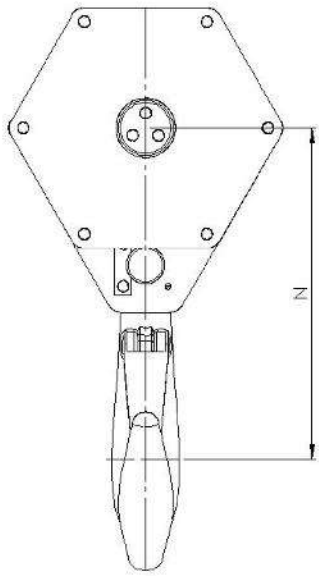
OVERALL DIMENSIONS (mm)								WLL(t) 1Bm/M3		Weight
Hook No	Wire rope (mm)	SHEAVE ØD	L	V	M	S	E	P	T	Kg
2,5	10	200	194	155	265	131	45	6,3	10	45
5	15	280	242	195	335	180	50	12,5	20	95
8	16	355	327	265	435	223	65	20	32	197
12	22	450	379	315	525	274	75	32	50	336
25	22	450	410	460	770	274	75	63	100	410

2.1 OVERHEAD/GANTRY CRANE BLOCKS

2.1.2 MEDIUM DUTY BLOCKS

2.1.2.1 Four Sheaves Block





- WLL: from 12t to 200t. Further sizes upon request.
- Hook: Single or Ramshorn. FORGED and HEAT TREATED fully MACHINED with nut & crosshead. Max size: 63 acc to DIN15400. Material grades: carbon (P) or alloy (T). Further hook sizes and higher alloys upon request.
- Sheave: 4 (8 falls). Cold Laminated, Welded or Solid. Further sheaves upon request.
- Bearing: axial for hook assembly + roller/ball for sheaves.
- Coating Protection: fully painted inside & outside.
- Certificate: EN10204-2.1. Load Test & FAT upon request.

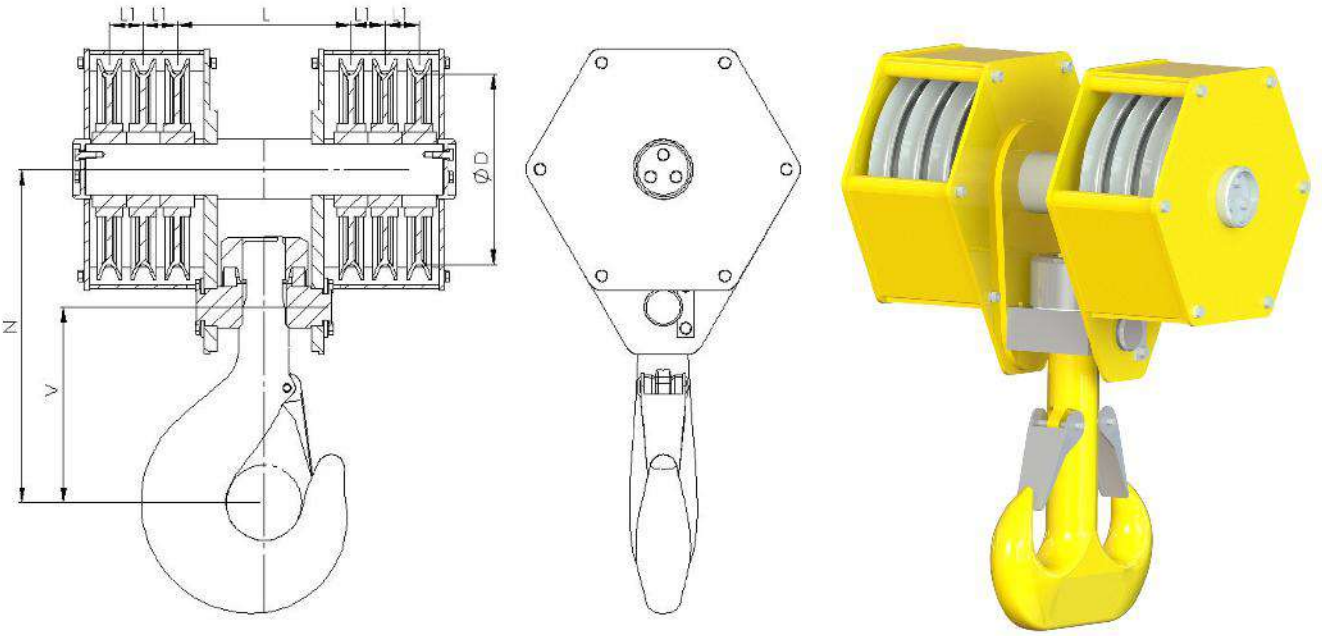
MEDIUM DUTY BLOCKS I FOUR SHEAVES BLOCK

OVERALL DIMENSIONS (mm)							WLL(t) 1Bm/M3	Weight
Hook No	Wire rope (mm)	D	L	L1	V	N	P	Kg
5	12	290	200	53	195	395	12,5	180
6	12	290	220	53	240	460	16	200
8	16	400	240	53	265	565	20	240
10	20	400	270	60	280	580	25	270
16	20	400	320	65	370	680	40	420
20	20	440	350	75	415	845	50	563
25	22	450	410	80	460	785	63	570
32	24	640	445	90	500	1005	80	1055
40	28	710	490	105	565	1130	100	1410
50	30	810	545	105	620	1240	125	1878
63	34	910	605	110	700	1380	160	2180

2.1 OVERHEAD/GANTRY CRANE BLOCKS

2.1.2 MEDIUM DUTY BLOCKS

2.1.2.2 Six Sheaves Block



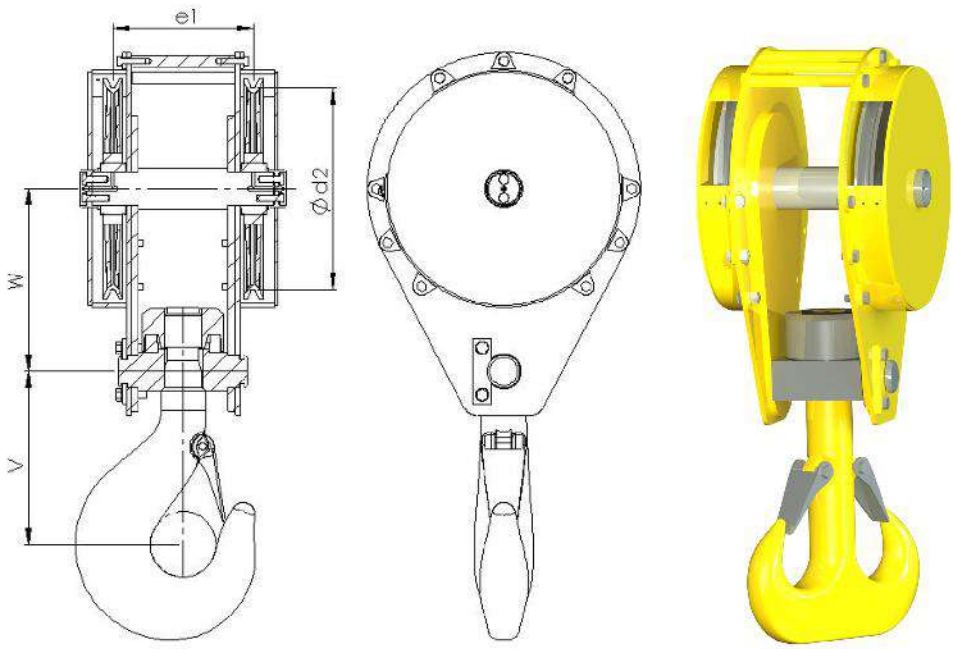
- WLL: from 50t to 300t. Further sizes upon request.
- Hook: Single or Ramshorn. FORGED and HEAT TREATED fully MACHINED with nut & crosshead.
  Max size: 63 acc to DIN15400. Material grades: carbon (P) or alloy (T). Further hook sizes and higher alloy steels upon request.
- Sheave: 6 (12 falls). Cold Laminated, Welded or Solid. Further sheaves upon request.
- Bearing: axial for hook assembly + roller/ball for sheaves.
- Coating Protection: fully painted inside & outside.
- Certificate: EN10204-2.1. Load Test & FAT upon request.

MEDIUM DUTY BLOCKS I SIX SHEAVES BLOCK								
OVERALL DIMENSIONS (mm)							WLL(t) 1Bm/M3	Weight
Hook No	Wire rope (mm)	D	L	L1	V	N	P	Kg
20	20	390	360	76	415	725	50	800
25	22	450	410	80	460	785	63	864
32	22	570	460	105	500	970	80	1158
40	24	650	495	105	565	1090	100	1518
50	26	720	550	110	620	1195	125	1958
63	28	820	610	120	700	1330	160	2645

2.1 OVERHEAD/GANTRY CRANE BLOCKS

2.1.3 HEAVY DUTY BLOCKS

2.1.3.1 Two Sheaves Block



- WLL: from 16t to 100t. Further sizes upon request.
- Hook: Single or Ramshorn. FORGED and HEAT TREATED fully MACHINED with nut & crosshead.
  Max size: 40 acc to DIN15400. Material grades: carbon (P) or alloy (T). Further hook sizes and higher alloy steels upon request.
- Sheave: 2 (4 falls). Cold Laminated, Welded or Solid. Further sheaves upon request.
- Bearing: axial for hook assembly + roller/ball for sheaves.
- Coating Protection: fully painted inside & outside.
- Certificate: EN10204-2.1. Load Test & FAT upon request.

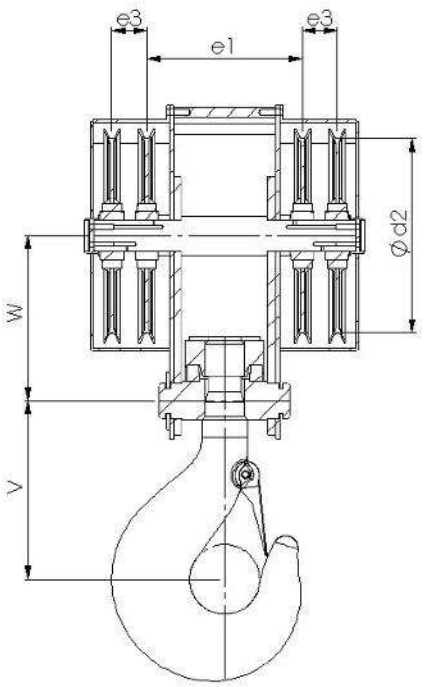
HEAVY DUTY BLOCKS I TWO SHEAVES BLOCK

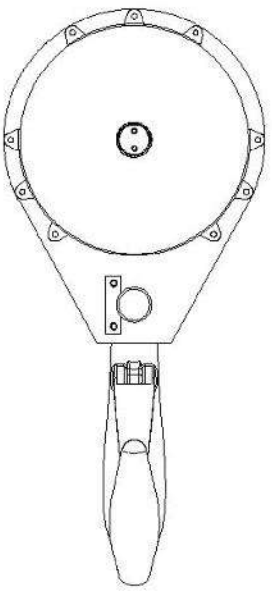
OVERALL DIMENSIONS (mm)						WLL (t) 1Bm/M3	Weight
HOOK No	Wire Rope (mm)	d_2	e_1	V	W	P	Kg
6	14	355	230	240	300	16	165
8	16	400	255	265	330	20	200
10	18	450	280	280	360	25	255
12	20	500	320	315	400	32	346
16	22	560	330	370	440	40	432
20	26	630	365	415	490	50	602
25	28	710	385	460	550	63	764
32	32	800	460	500	600	80	1109
40	36	900	495	565	670	100	1518

2.1 OVERHEAD/GANTRY CRANE BLOCKS

2.1.3 HEAVY DUTY BLOCKS

2.1.3.2 Four Sheaves Block



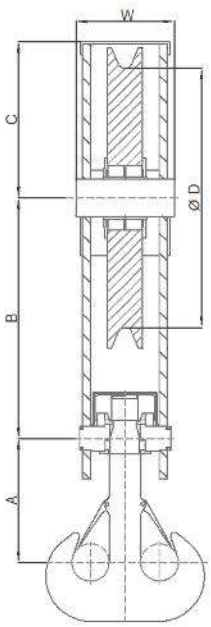


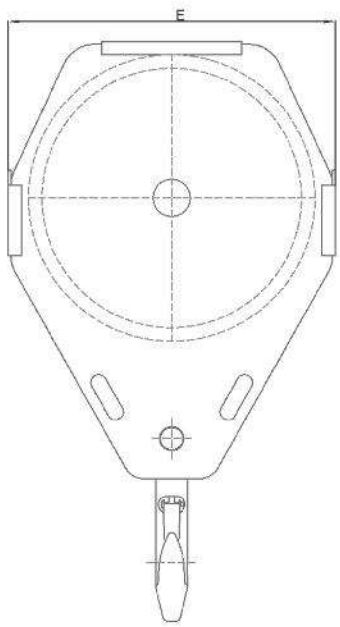
- WLL: from 60t to 500t. Further sizes upon request.
- Hook: Single or Ramshorn. FORGED and HEAT TREATED fully MACHINED with nut & crosshead. Max size: 125 acc to DIN15400. Material grades: carbon (P) or alloy (T). Further hook sizes and higher alloy steels upon request.
- Sheave: 4 (8 falls). Cold Laminated, Welded or Solid. Further sheaves upon request.
- Bearing: axial for hook assembly + roller/ball for sheaves.
- Coating Protection: fully painted inside & outside.
- Certificate: EN10204-2.1. Load Test & FAT upon request.

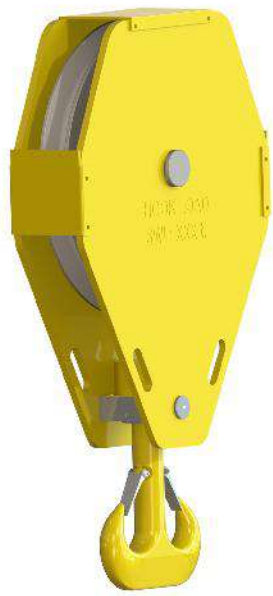
HEAVY DUTY BLOCKS I FOUR SHEAVES BLOCK								
OVERALL DIMENSIONS (mm)							WLL(t) 1Bm/M3	Weight
Hook No	Wire Rope (mm)	d2	L	L1	V	W	P	Kg
25	20	560	400	100	460	450	63	798
32	22	630	465	105	500	500	80	1145
40	26	710	520	130	565	560	100	1605
50	28	800	585	145	620	615	125	2143
63	32	900	655	155	700	675	160	2950
80	36	1000	705	165	800	735	200	3830
100	40	1120	775	170	885	815	250	5140
125	44	1250	845	195	1000	885	320	6698

2.2 OFFSHORE CRANE BLOCKS

2.2.1 SINGLE SHEAVE OFFSHORE BLOCK







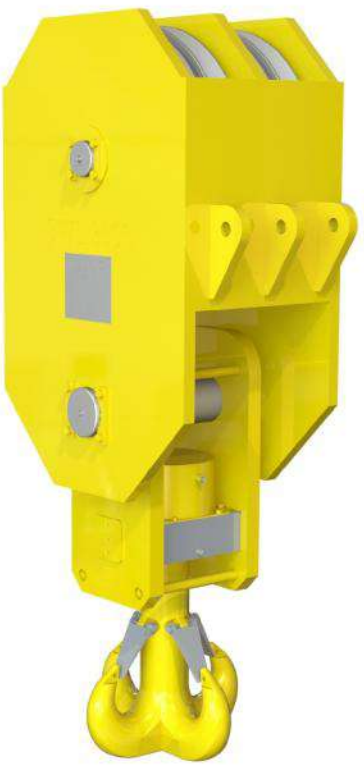
- WLL: from 80t to 500t.
- Hook: Single or Ramshorn. FORGED and HEAT TREATED fully MACHINED with nut & crosshead. Max size: 125 acc to DIN15400. Material grades: alloy (T/V). Further hook sizes upon request.
- Sheave: 1 (2 falls). Solid sheave.
- Bearing: axial for hook assembly + roller/spherical-roller for sheaves. Bronze bushing fully recommended.
- Coating Protection: fully painted inside & outside for offshore environment.
- Sealings: for offshore topsite and subsea lifting.
- Certificate: EN10204-2.1. Load Test & FAT upon request.

OFFSHORE CRANE BLOCKS I SINGLE SHEAVE BLOCK

		OVERALL DIMENSIONS (mm)						WLL(t) 1Bm/M3	Weight
Hook No	Wire Rope (mm)	ØD	W	A	B	C	E	T	Kg
20	42	800	382	445,5	900	520	1090	80	1500
32	56	1080	485	532	1150	670	1410	125	3346
50	70	1350	575	654,5	1350	830	1720	200	5707
80	74	1410	665	838	1500	870	1730	320	7992
100	76	1450	738	926	1500	890	1840	400	9307
125	86	1650	783	1037	1650	1020	2110	500	14942

2.2 OFFSHORE CRANE BLOCKS

2.2.2 MULTIPLE SHEAVES OFFSHORE BLOCK



- WLL: from 80t to 2.000t.
- Hook: Ramshorn or Quad based on DIN15400 or others. FORGED and HEAT TREATED fully MACHINED with nut & crosshead.
  Material grades: alloy (T/V). See chapter 1 (Crane Hooks).
- Sheave: Multiple sheaves. Solid sheaves.
- Bearing: axial for hook assembly + roller/spherical-roller for sheaves. Bronze bushing fully recommended.
- Coating Protection: fully painted inside & outside for offshore environment.
- Sealings: for offshore topsite and subsea lifting.
- Certificate: EN10204-3.1. For 3.2 cert with ABS, DNV, ... upon request.

2.3 OTHER TYPE OF CRANE BLOCKS

2.3.1 TOWER CRANE BLOCK

- Hook: Single or Ramshorn based on DIN15400 or others. FORGED and HEAT TREATED fully MACHINED with nut & crosshead. Material grades: carbon (P) or alloy (T/V). See chapter 1 (Crane Hooks).
- Sheave: 1 or 2 sheaves (2 or 4 falls). Cold Laminated or Technical Plastic.
- Bearing: axial for hook assembly + roller/ball for sheaves.
- Coating Protection: fully painted inside & outside.
- Certificate: EN10204-3.1. For 3.2 cert with ABS, DNV, ... upon request.

2.3 OTHER TYPE OF CRANE BLOCKS

2.3.2 MOBILE CRANE BLOCKS

- WLL: from 8t to 100t. Further sizes upon request.
- Hook: Single or Ramshorn based on DIN15400 or others. FORGED and HEAT TREATED fully MACHINED with nut & crosshead. Material grades: carbon (P) or alloy (T/V). See chapter 1 (Crane Hooks).
- Sheave: 1 or multiple sheaves. Cold Laminated, Welded, Solid or technical plastic.
- Bearing: axial for hook assembly + roller/ball for sheaves.
- Coating Protection: fully painted inside & outside.
- Certificate: EN10204-3.1. For 3.2 cert with ABS, DNV, ... upon request.

SUBSEA FORGED HOOKS

3.0 INTRO

SUBSEA is considered OFFSHORE environment and it´s divided into shallow water and deep water (PRESALT, SALT and POSTSALT for latins).

SUBSEA Deep Water application is considered one of the most critical OFFSHORE application because of the poor accessibility of the products, harsh environment and high costs to get the products back to top site. Consequently maintenance jobs are difficult to manage and long life times are required.

Under these conditions, FORGED material is the preferred & valued technology to guarantee long life times with low maintenance costs. For high safety factor during long life time, super alloy steels are the preferred steel grades to guarantee a safe functional long life products. Surface protection & coatings have also a key role to keep designed life times.

Besides forging material IRIZAR subsea hooks are fully BENDED with 100% grain orientation, following the good practices of international crane hook rules and standards.

Related to hooks, because its geometry, can comply with different purposes, being the main ones:

Related to **SUBSEA LIFTING**, the crane is regularly located top site, even if recently semi-submergible and submergible cranes are being designed and installed. This kind of Offshore cranes regularly do subsea operations: most of them they do in shallow water, but others do deep water for e.g maniffols recovery, seabed pipeline maintenance or repair… being possible to do operations up to 4.000m subsea.

Related to **LONG TERM MOORING LINE**, main technology to fix floating structures into the seabed, forged hook is a great product to link two chains, chain with rope, rope with sling… or any technology used for floating structures mooring lines. Recently other technologies beside steel chain are being used and recommended by installation companies based on two criterias:

* Weight of mooring line in deep water.
* Cost of commissioning & installation.

IRIZAR FORGE is approved by DNV & ABS to produce, test & certify Offshore Mooring Accessories in material R4 according to "DNV-OS-E302 Offshore Mooring Chain" and "ABS Guide for Offshore Mooring Chain" (see annex 3 and 4).

Mooring Line is being a combination technology in recent projects, combining steel with fiber products: steel chain, steel wire ropes, synthetic ropes and textile slings. Combination of all 4 technologies is reducing commissioning costs and reducing weight. Hooks and other links are in between different technologies to ensure a permanent steel-fiber, steel-steel or fiber-fiber join or linkage.

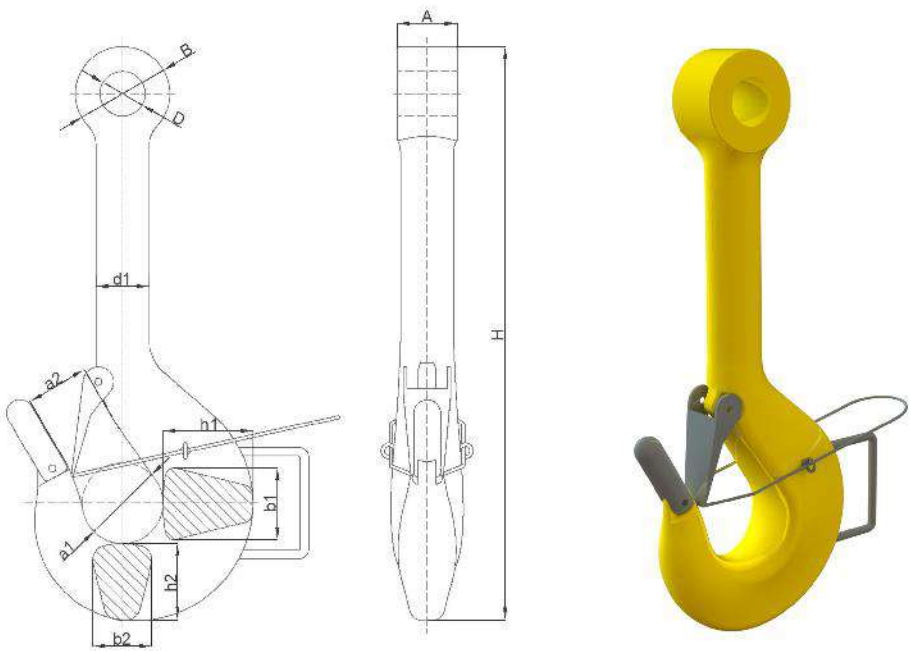
Seabed is full of **PIPELINES** and related equipment: pipelines are flexible to avoid crack when ocean currents effect hits against pipes and related equipment. PLET hook (pipe line end termination), is used to return the pipe to the original position and correct its position permanently.

Seabed is also full of rubbish as consequence of decades extraction activity: hooks together with ROV systems are used to **COLLECT & RECOVER** materials and clean seabed for environmental reasons.

Enjoy SUBSEA FORGED HOOK RANGE in the following pages.

3.1 FORGED ROV EYE HOOKS

3.1.1 LONG SHANK ROV EYE HOOK



- WLL: from 10t to 600t.
- Hook FORGED and HEAT TREATED. Fully bended with 100% grain orienting.
- Material: carbon, alloys and super alloys. Most regular: super alloy steel (R4).
- Surface Protection & Coatings: upon request
- Safety Factor: min. 4:1.
- Load Test: requested / recommended. ILO-3, FAT or Breaking Test available upon request.
- Certificate: EN10204-3.1. For 3.2, Mooring Accessory Cert with ABS and DNV upon request (see annex 3 and 4).

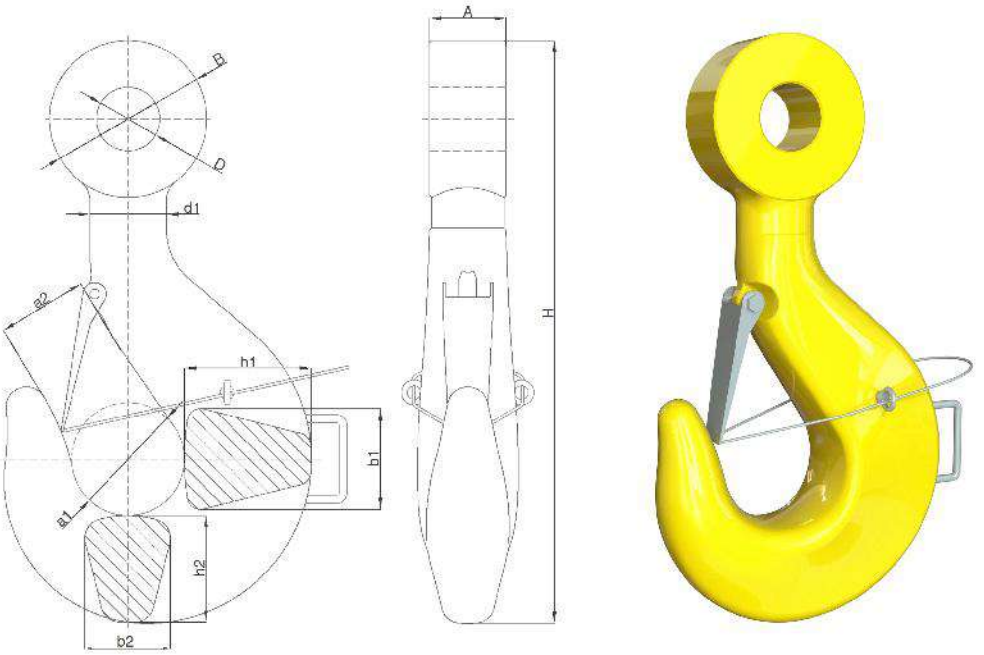
FORGED ROV EYE HOOKS I LONG SHANK ROV EYE HOOK

	OVERALL DIMENSIONS (mm)													Weight
No	WLL (t)	MBL (t)	a1	a2	b1	b2	h1	h2	d1	A	D	B	H	Kg
2,5	12	46	63	50	53	45	67	58	42	47	40	100	600	15
5	22	88	80	63	71	60	90	75	53	68	53	120	682	25
6	32	126	90	71	80	67	100	85	60	75	60	130	790	40
12	55	220	125	100	112	95	140	118	85	97	74	155	919	84
16	80	320	140	112	125	106	160	132	95	110	87	180	1046	112
20	100	400	160	125	140	118	180	150	106	118	100	210	1112	157
25	120	480	180	140	160	132	200	170	118	134	100	210	1277	220
32	150	600	200	160	180	150	224	190	132	140	114	240	1402	310
40	200	800	224	180	200	170	250	212	150	150	137	290	1551	450
50	250	1000	250	200	224	190	280	236	170	170	147	310	1664	630
63	300	1200	280	224	250	212	315	265	190	190	158	330	1848	840
80	400	1600	315	250	280	236	355	300	212	205	184	380	2085	1195
100	500	2000	355	280	315	265	400	335	236	230	194	400	2271	1635
125	600	2400	400	315	355	300	450	375	265	255	215	450	2475	2280

WLL Work ıg load limit using R4 material.
Tolerance -0/+7% forging tolerance.
EYE dimensions (A, B, D) and other dimensions can be modified.

3.1 FORGED ROV EYE HOOKS

3.1.2 STANDARD SHANK ROV EYE HOOK



- WLL: from 80t to 1.000t.
- Hook FORGED and HEAT TREATED. Fully bended with 100% grain orienting.
- Material: carbon, alloys and super alloys. Most regular: super alloy steel (R4).
- Surface Protection & Coatings: upon request.
- Safety Factor: min. 4:1.
- Load Test: requested / recommended. ILO-3, FAT or Breaking Test available upon request.
- Certificate: EN10204-3.1. For 3.2, Mooring Accessory Cert with ABS and DNV upon request (see annex 3 and 4).

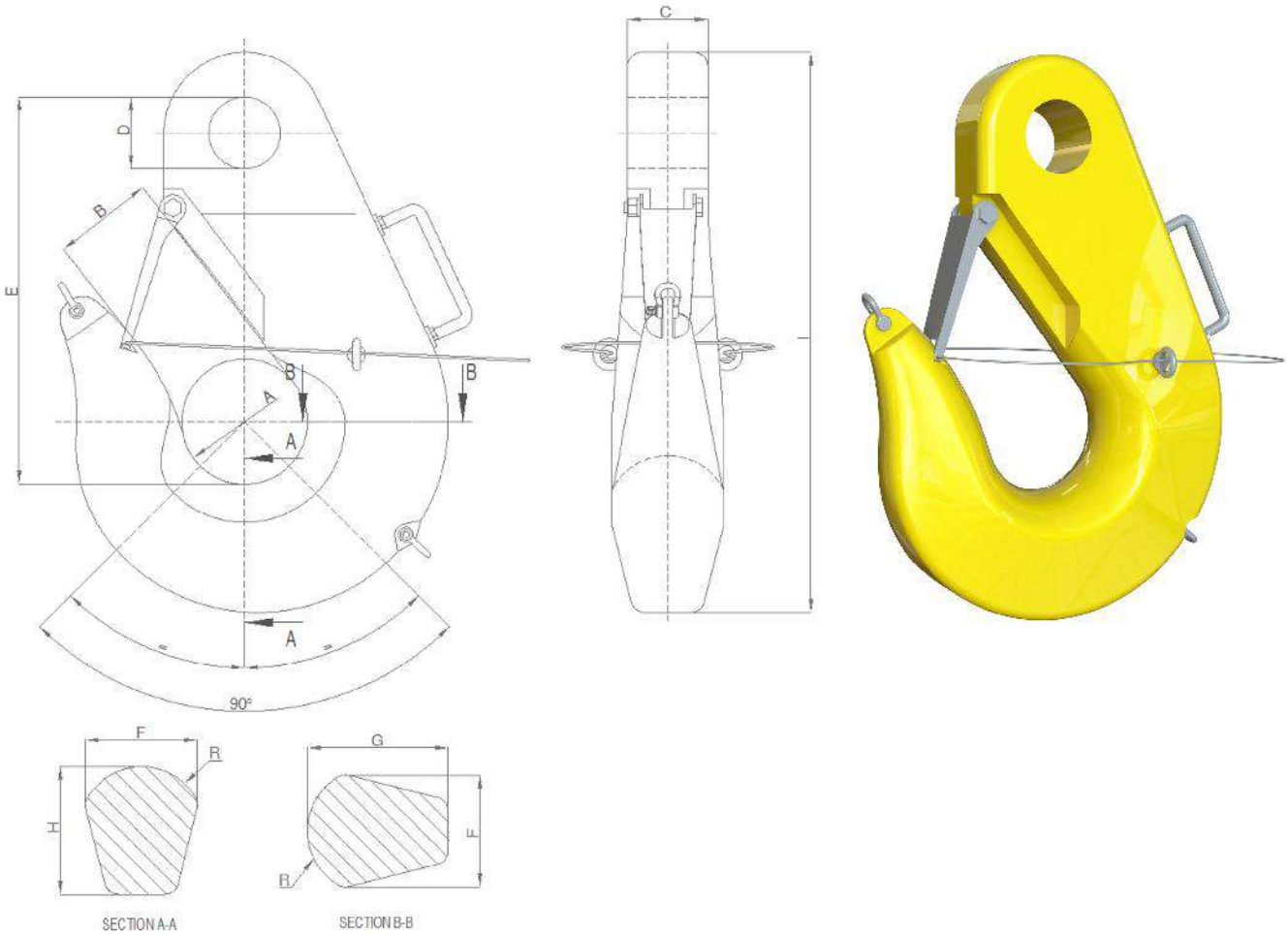
FORGED ROV EYE HOOKS I STANDARD SHANK ROV EYE HOOK

	OVERALL DIMENSIONS (mm)													Weight
No	WLL (t)	MBL (t)	a1	a2	b1	b2	h1	h2	d1	A	D	B	H	Kg
16	80	320	140	112	125	106	160	132	95	110	87	180	746	96
20	100	400	160	125	140	118	180	150	106	118	100	210	812	137
25	120	480	180	140	160	132	200	170	118	134	100	210	927	190
32	150	600	200	160	180	150	224	190	132	140	114	240	1052	272
40	200	800	224	180	200	170	250	212	150	150	137	290	1201	397
50	250	1000	250	200	224	190	280	236	170	170	147	310	1314	544
63	300	1200	280	224	250	212	315	265	190	190	158	330	1448	730
80	400	1600	315	250	280	236	355	300	212	205	184	380	1685	1079
100	500	2000	355	280	315	265	400	335	236	230	194	400	1871	1487
125	600	2400	400	315	355	300	450	375	265	255	215	450	2075	2090
160	800	3200	450	355	400	335	500	425	300	280	240	500	2294	2902
200	1000	4000	500	400	450	375	560	475	335	320	280	580	2450	4079
250	1250	5000	560	450	500	425	630	530	375	355	315	650	2810	5707
320	1550	6200	630	500	560	475	710	580	425	355	335	680	3060	7697
400	1800	7200	710	560	630	530	800	630	475	410	395	750	3430	10840

WLL Working load limit using R4 material.
Tolerances: -0/+7% forging tolerance.
EYE dimensions (A, B, D) and other dimensions can be modified.

3.2 FORGED ROV HOOKS

3.2.1 STANDARD ROV HOOK



- WLL: from 50t to 1.000t.
- Hook FORGED and HEAT TREATED. Fully bended with 100% grain orienting.
- Material: carbon, alloys and super alloys. Most regular: super alloy steel (R4).
- Surface Protection & Coatings: upon request.
- Safety Factor: min. 4:1.
- Load Test: requested / recommended. ILO-3, FAT or Breaking Test available upon request.
- Certificate: EN10204-3.1. For 3.2, Mooring Accessory Cert with ABS and DNV upon request (see annex 3 and 4).

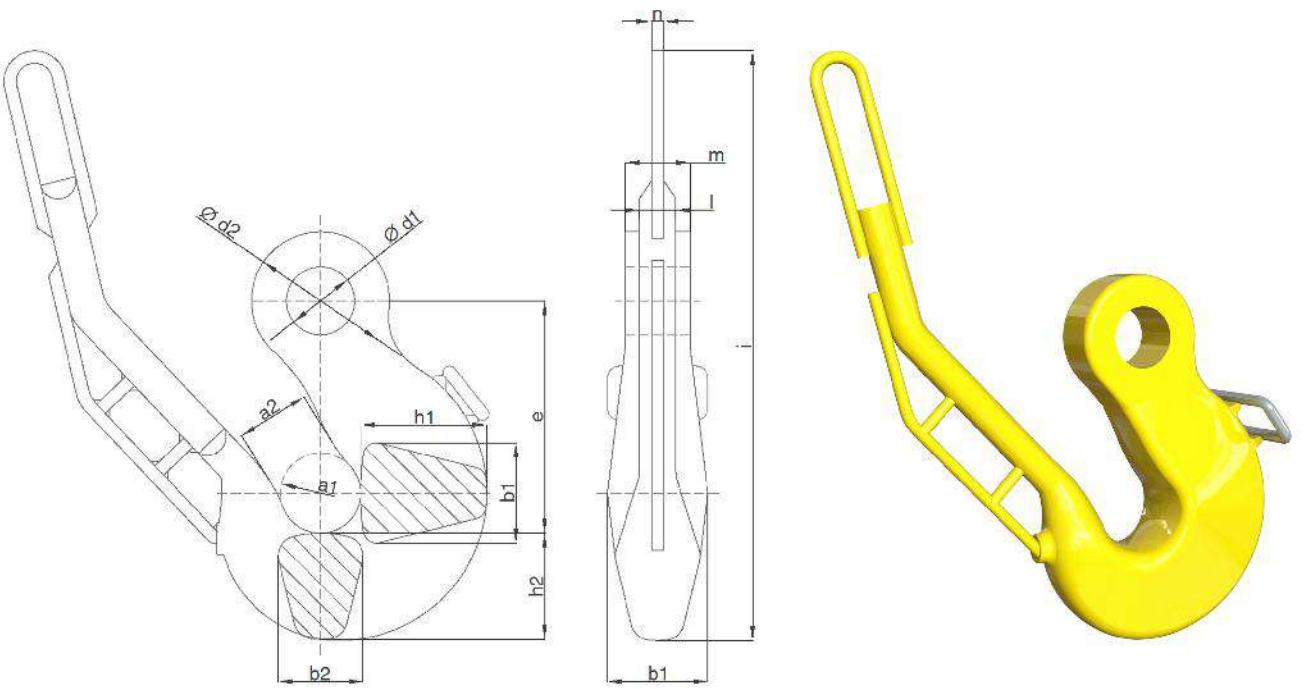
FORGED ROV HOOKS I STANDARD ROV HOOK

	OVERALL DIMENSIONS (mm)												Weight
No	WLL (t)	MBL (t)	A	B	C	D	E	F	R	G	H	I	kg
10	50	200	112	90	80	75	390	100	55	125	115	555	65
12	63	250	125	100	100	80	425	112	60	140	125	605	88
16	80	320	140	112	100	87	465	125	60	160	145	670	112
20	100	400	160	125	130	100	530	140	80	180	165	760	160
25	120	480	180	140	130	100	560	160	80	200	185	815	220
32	150	600	200	160	140	114	590	180	90	224	205	865	305
40	200	800	224	180	150	137	680	200	110	250	225	985	455
50	250	1000	250	200	170	147	750	224	125	280	250	1090	605
63	300	1200	280	224	190	158	865	250	140	315	285	1250	845
80	400	1600	315	250	205	184	910	280	170	355	320	1335	1180
100	500	2000	355	280	230	194	985	315	180	400	360	1455	1510
125	600	2400	400	315	255	215	1035	355	190	450	400	1555	2050
160	800	3200	450	355	280	240	1180	400	220	500	455	1775	3090
200	1000	4000	500	400	320	280	1340	450	240	560	510	2010	4380

WLL Working load limit using R4 material.
Tolerances: -0/+7% forging tolerance.
EYE dimensions (C, D) can be modified

3.2 FORGED ROV HOOKS

3.2.2 KS-ROV HOOK



- WLL: from 200t to 345t.
- Hook FORGED and HEAT TREATED (nose welded). Body fully bended with 100% grain orienting.
- Material: carbon, alloys and super alloys. Most regular: super alloy steel (R4).
- Surface Protection & Coatings: upon request.
- Safety Factor: min. 4:1.
- Load Test: requested / recommended. ILO-3, FAT or Breaking Test available upon request.
- Certificate: EN10204-3.1. For 3.2, Mooring Accessory Cert with ABS and DNV upon request (see annex 3 and 4).

FORGED ROV HOOKS | KS-ROV HOOKS

	OVERALL DIMENSIONS (mm)													Weight
No	a1	a2	b1	b2	d1	d2	e	h1	h2	l	l	m	n	Kg
KS40	200	165	200	170	135	334	578	250	225	1440	90	130	32	395
KS50	200	180	245	200	170	345	580	315	256	1470	90	163	32	610

WLL Working load limit using R4 material.
Tolerances: -0/+7% forging tolerance.
EYE dimensions (d1,d2, m) can be modified.

3.2 FORGED ROV HOOKS

3.2.3 CUSTOM ROV HOOK

IRIZAR FORGE team can accommodate any forged ROV hook to the specific subsea lifting or mooring operation the market is ready to operate **up to 2.000t**, from safety, design, material strength and certification point of view.

- WLL: from 20t to 2.000t.
- Hook FORGED and HEAT TREATED (nose welded).
- Material: carbon, alloys and super alloys. Most regular: super alloy steel (R4).
- Surface Protection & Coatings: upon request
- Safety Factor: min. 4:1.
- Load Test: requested / recommended. ILO-3, FAT or Breaking Test available upon request.
- General Tolerances: -0/+7% for forged parts.
- Certificate: EN10204-3.1. For 3.2, Mooring Accessory Cert with ABS and DNV upon request (see annex 3 and 4).

3.2.3.1 LOAD TRANSFER hook.

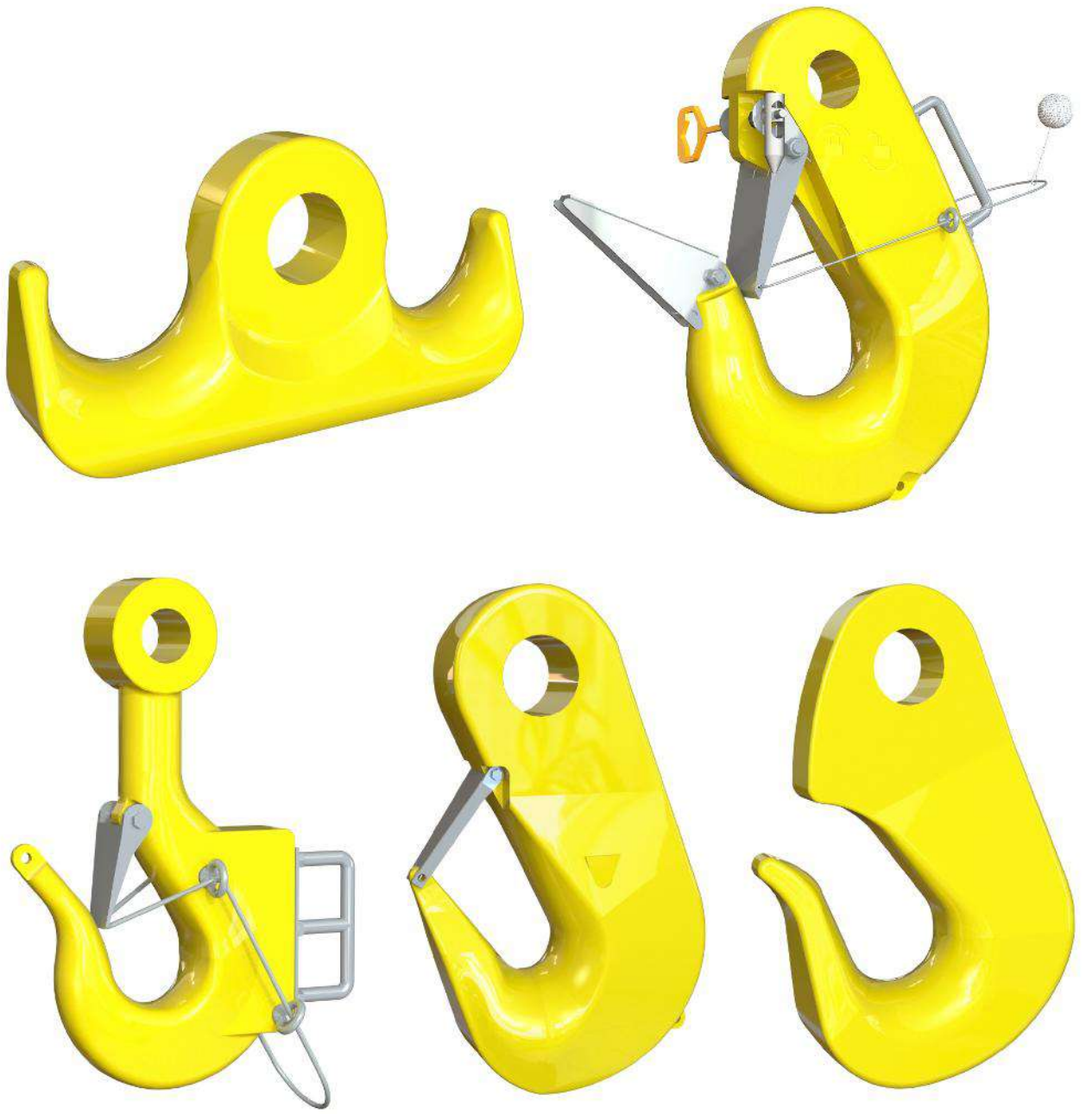
3.2.3.2 CLEVIS ROV hook.

3.2 FORGED ROV HOOKS

3.2.3 CUSTOM ROV HOOK

IRIZAR FORGE team can accommodate any forged ROV hook to the specific subsea lifting or mooring operation the market is ready to operate **up to 2.000t**, from safety, design, material strength and certification point of view.

3.2.3.3 Other CUSTOM ROV hooks designs

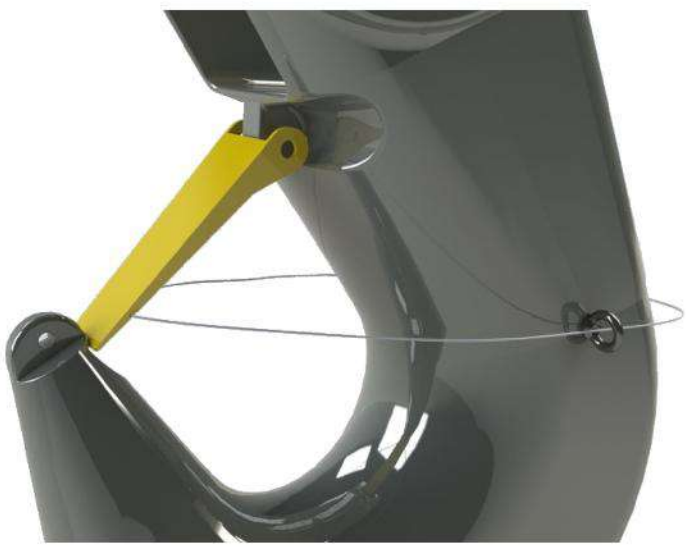


- WLL: from 20t to 2.000t.
- Hook FORGED and HEAT TREATED.
- Material: carbon, alloys and super alloys. Most regular: super alloy steel (R4).
- Surface Protection & Coatings: upon request
- Safety Factor: min. 4:1.
- Load Test: requested / recommended. ILO-3, FAT or Breaking Test available upon request.
- General Tolerances: -0/+7% for forged parts.
- Certificate: EN10204-3.1. For 3.2, Mooring Accessory Cert with ABS and DNV upon request (see annex 3 and 4).

3.3 ROV FRIENDLY ACCESSORIES

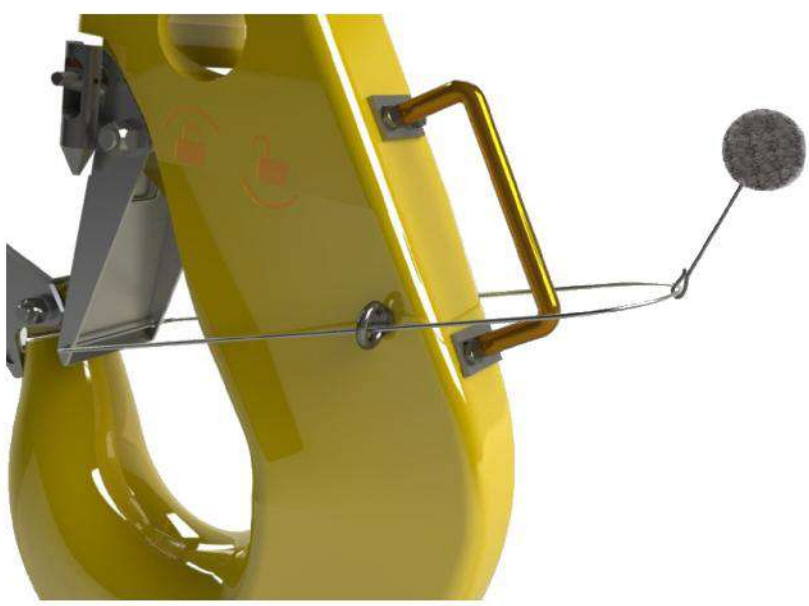
3.3.1 SAFETY LATCH

- Material: stainless steel.
- Useful for: ROV operations opening and closing.
- Additional accessories: monkey fits, rope, eye bolts
- Test: FAT upon request.



3.3.2 MONKEY FIST

- Material: textile.
- Suitable for: ROV operations handling.
- Additional accessories: rope
- Test: FAT upon request.



3.3 ROV FRIENDLY ACCESSORIES

3.3.3 FISHING DEVICE

- Material: stainless steel.
- Useful for: fishing and hooking other connectors.
- Additional accessories: rope, eye bolts.
- Test: FAT upon request.

3.3.4 HANDLES

- Material: stainless steel.
- Suitable for: ROV operations and hook handling.
- Test: FAT upon request.

3.3.5 PADEYES

- Material: non welded, belonging to forging.
- Useful for: hook handling operations.
- Additional accessories: shackle, lifting points…
- Test: FAT upon request.

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LIFTING & MOORING

IRIZAR FORGE

FORGED SHACKLES

4.0 INTRO

Shackle is considered critical accessory from safety point of view because is one of the major hardware link between the crane and the load, and regularly works fix together with chain or non steel fittings as textile slings and similar terminals.

Related to **LIFTING application**, its considered a fix/static temporary rigging accessory and does not belong to the crane itself. Straight design shackles are regularly used for 1 pull and bow design shackles for various pulls. For heavy duty lifting operations widebody is the referred and valued product, that guarantees a safe radius of the related sling into operation, that guarantees a longer life time of the related sling.

Related to **MOORING application**, forged shackle is a great product to link two chains, chain with rope, rope with sling, connected to triplates and masterlinks… or any technology used for floating structures long term mooring lines. Recently other technologies beside steel chain are being used and recommended by installation companies based on two criterias:

* Weight of mooring line in deep water.
* Cost of commissioning & installation.

IRIZAR FORGE is approved by DNV and ABS to produce, test & certify Offshore Mooring Accessories in material R4 according to "DNV-OS-E302 Offshore Mooring Chain" and "ABS Guide for Offshore Mooring Chain" (see annex 3 and 4).

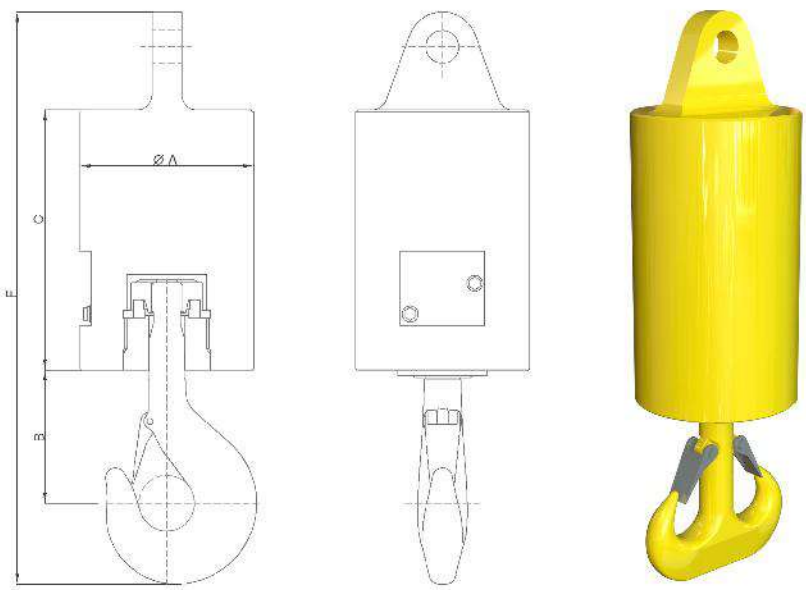
Mooring Line is being a combination technology in recent projects, combining steel with fiber products: steel chain, steel wire ropes, synthetic ropes and textile slings. Combination of all 4 technologies is reducing commissioning costs and reducing weight. Shackles and other links are in between different technologies to ensure a permanent steel-fiber, steel-steel or fiber-fiber join or linkage.

Under this specific conditions, FORGED material is the preferred technology to guarantee safety and long life time. For high safety factors during long life times, super alloy steels are the valued ones to guarantee functionality, safe operating and low maintenance costs during its long life time.

As for forged hooks, all shackles are produced for operating temperatures from -40ºC to +200ºC, considered normal, abnormal and extreme conditions.

Enjoy FORGED SHACKLE RANGE in the following pages.

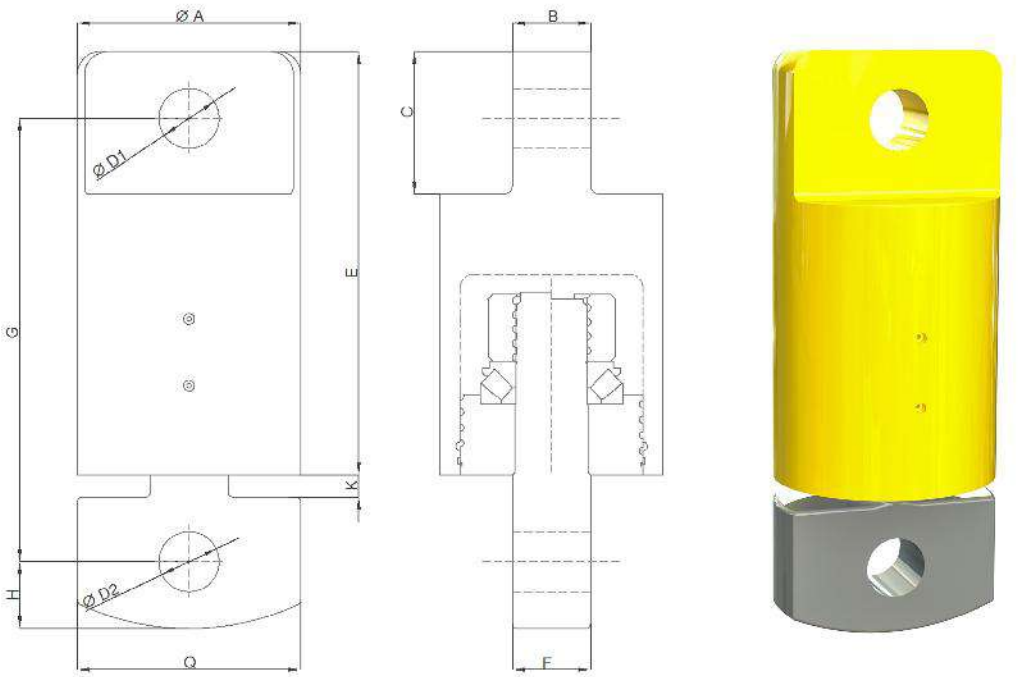
5.1 SWIVEL HOOKS



- WLL/SWL: from 50t to 1.500t.
- Hook FORGED, HEAT TREATED and MACHINED, as per DIN15400 design or others upon request.
- Cover: free of weld
- Material: carbon steel, alloy and super alloy. Most regular super alloy steel.
- Coating Protection: fully painted.
- Safety Factor: 4:1.
- Sealings: for onshore lifting, offshore topsite and subsea lifting & mooring.
- Load Test: requested and recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

SWIVEL HOOKS						
	OVERALL DIMENSIONS (mm)					Weight
WWL (t)	Hook No	A	B	C	F	kg
125	25	575	523	575	1827	1000
150	40	650	570,5	650	1783	1300
162	50	775	570,5	775	2138,5	1500
200	50	780	648	780	2289	2000
250	63	1200	738	1200	2515	3500
250	80	760	738	760	2471	8000
300	100	1750	814	1750	3342	12000
400	125	1725	908,5	1725	3931	12000

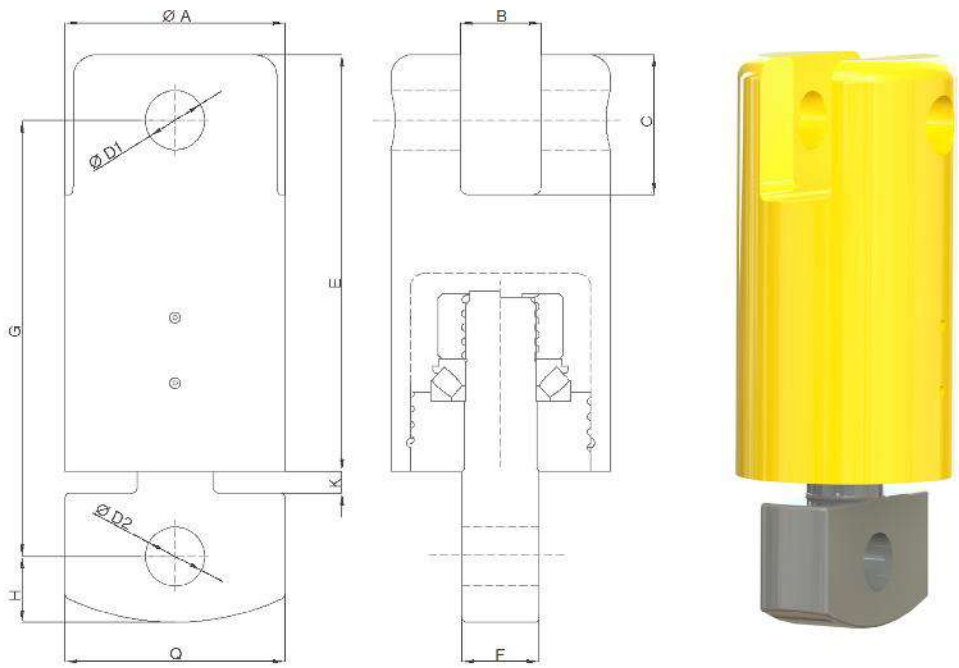
5.2 EYE-EYE SWIVEL



- WLL/SWL: from 50t to 1.500t.
- Hook FORGED, HEAT TREATED and MACHINED, as per DIN15400 design or others upon request.
- Cover: free of weld.
- Material: carbon steel, alloy and super alloy. Most regular super alloy steel.
- Coating Protection: fully painted.
- Safety Factor: 4:1.
- Sealings: for onshore lifting, offshore topsite and subsea lifting & mooring.
- Load Test & MBL: requested and recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

SWIVEL EYE-EYE												
	OVERALL DIMENSIONS (mm)											Weight
WLL (t)	A	B	C	D1	D2	E	F	G	H	K	Q	kg
200	500	175	320	135	135	950	175	995	150	50	500	1114
300	600	200	365	155	155	1100	200	1150	180	50	600	1841
400	650	216	410	180	180	1150	226	1200	205	50	650	2150

5.3 EYE-CLEVIS SWIVEL



- WLL/SWL: from 50t to 1.500t.
- Hook FORGED, HEAT TREATED and MACHINED, as per DIN15400 design or others upon request.
- Cover: free of weld.
- Material: carbon steel, alloy and super alloy. Most regular super alloy steel.
- Coating Protection: fully painted.
- Safety Factor: 4:1.
- Sealings: for onshore lifting, offshore topsite and subsea lifting & mooring.
- Load Test & MBL: requested and recommended.
- Certificate: EN10204-3.1. For 3.2, ILO-3, FAT or Breaking Test available upon request.

SWIVEL EYE-CLEVIS												
	OVERALL DIMENSIONS (mm)											Weight
WLL(t)	A	B	C	D1	D2	E	F	G	H	K	Q	kg
200	11	185	320	135	135	950	175	995	150	50	500	1122
300	600	210	365	155	155	1100	200	1150	180	50	600	1910
400	650	226	410	180	180	1150	226	1200	205	50	650	2285

CONNECTORS

6.0 INTRO

Connectors or Links are used both for Lifting as well as Mooring Applications and it is considered critical accessory from safety point of view because is one of the major hardware link between the crane and the load, and regularly works fix together with chain or non steel fittings as textile slings and similar terminals.

For **Lifting application**, connectors are considered as rigging accessories, consequently the links are not belonging to the crane itself, but as a separate and temporary crane accessory.

For **Subsea Mooring**, links & connectors are considered part of the long term mooring line for floating platforms. Regularly floating platforms are located in deep water seas.
SUBSEA Deep Water application is considered one of the most critical OFFSHORE application because of the poor accessibility of the products, harsh environment and high costs to get the products back to top site. Consequently maintenance jobs are difficult to manage and long life times are required.

Under these conditions, FORGED material is the preferred & valued technology to guarantee long life times with low maintenance costs. For high safety factor during long life time, super alloy steels are the preferred steel grades to guarantee a safe functional long life products. Surface protection & coatings have also a key role to keep designed life times.

Related to connectors, because its geometry, can comply with different purposes, being the main ones:

Related to **LIFTING**, the main connector is MASTER LINK besides shackles (see chapter 4 SHACKLES) and its considered crane accessories not belonging to the crane itself. Crane can be an onshore or offshore crane: the latest can be dry operation or subsea operations: most of them they do in shallow water, but others do deep water for e.g maniffols recovery, seabed pipeline maintenance or repair… being possible to do operations up to 4.000m subsea.

Related to **LONG TERM MOORING LINE**, the most popular connector designs are H-Link & Y-Links as preferred product to link two chains, chain with rope, rope with sling… or any technology used for floating structures mooring lines. Recently other technologies beside steel chain are being used and recommended by installation companies based on two criterias:

* Weight of mooring line in deep water.
* Cost of commissioning & installation.

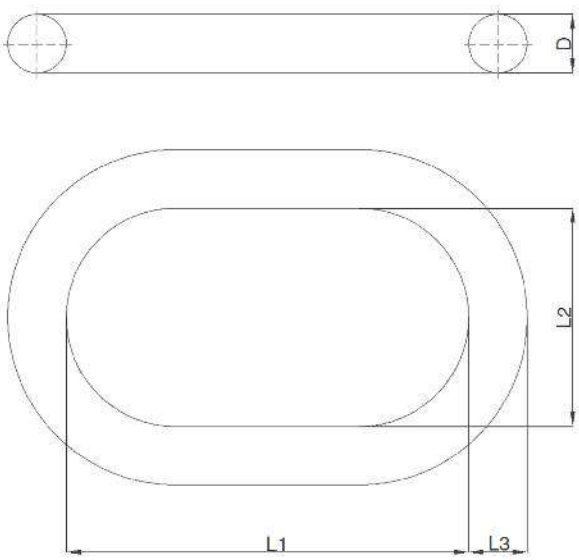
IRIZAR FORGE is approved by DNV and ABS to produce, test & certify Offshore Mooring Accessories in material R4 according to "DNV-OS-E302 Offshore Mooring Chain" and "ABS Guide for Offshore Mooring Chain" (see annex 3 and 4).

Mooring Line is being a combination technology in recent projects, combining steel with fiber products: steel chain, steel wire ropes, synthetic ropes and textile slings. Combination of all 4 technologies is reducing commissioning costs and reducing weight. Links & connectors are in between different technologies to ensure a permanent steel-fiber, steel-steel or fiber-fiber join or linkage.



Enjoy CONNECTORS RANGE in the following pages.

6.1 MASTER LINK

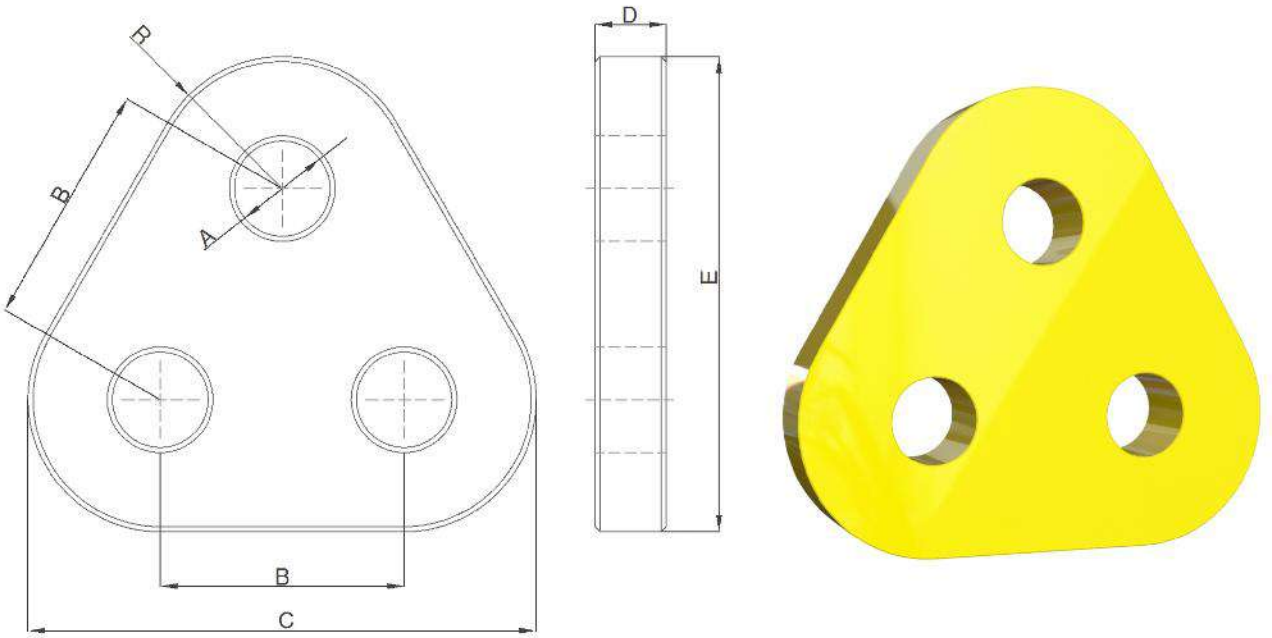


- WLL: from 155t to 1.500t.
- Master links FORGED and HEAT TREATED.
- Material: carbon steel, alloy and super alloy. Most regular super alloy steel (R4).
- Coating Protection: upon request.
- Safety Factor: min. 4:1.
- Load Test: requested and recommended. ILO-3, FAT or Breaking Test available upon request.
- Certificate: EN10204-3.1. For 3.2, Mooring Accessory Cert with ABS and DNV upon request (see annex 3 and 4).

CONNECTORS I STANDARD MASTER LINK						
OVERALL DIMENSIONS (mm)						Weight
WLL (t)	MBL (t)	D	L1	L2	L3	kg
157	628	100	500	300	100	103
250	1000	115	600	400	115	165
300	1200	115	600	300	115	160
400-1	2000	115	490	250	115	135
400-2	2000	115	700	250	115	169
400-3	1600	155	800	400	205	525
500	2000	175	800	400	220	648
600	2400	195	800	400	230	763
700	2800	200	850	400	235	835
800	3200	210	850	400	245	922
900	3600	230	900	400	270	1182
1000	4000	240	900	400	280	1292
1250	5000	260	1000	400	310	1695
1500	6000	270	1000	400	320	1832

Tolerance: forged surface tolerance +/-5% .

6.2 TRIPLATE



- WLL: from 120t to 700t.
- Triplates FORGED, HEAT TREATED and MACHINED.
- Material: carbon steel, alloy and super alloy. Most regular super alloy steel (R4)
- Coating Protection: upon request.
- Safety Factor: min. 4:1.
- Load Test: requested and recommended. ILO-3, FAT or Breaking Test available upon request.
- Certificate: EN10204-3.1. For 3.2, Mooring Accessory Cert with ABS and DNV upon request (see annex 3 and 4).

CONNECTORS I STANDARD TRIPLATE							
	OVERALL DIMENSIONS (mm)						Weight
WLL (t)	A	B	C	D	E	R	kg
120	105	280	620	100	582	170	188
150	115	320	690	110	647	185	256
175	115	320	710	110	667	195	274
200	140	390	820	120	768	215	390
250	150	390	870	140	818	240	518
300	160	420	920	150	864	250	617
400	185	490	1090	200	1024	300	1170
500	200	550	1270	200	1196	360	1619
600	220	600	1400	200	1320	400	1972
700	230	600	1400	250	1320	400	2452

Tolerance: machined surface tolerance +/-1%. +/-5% for D tolerance.

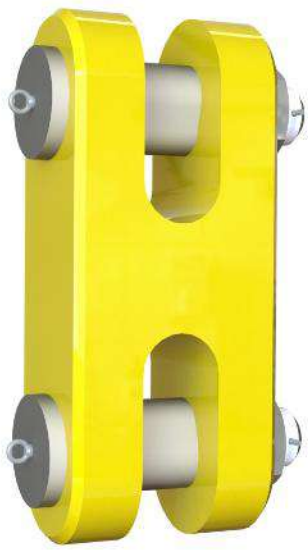
6.3 CUSTOM CONNECTORS

IRIZAR FORGE team can accommodate any forged connector to the specific lifting, rigging or mooring operation the market is ready to operate **up to 1.500t**, from safety, design, material strength and certification point of view.

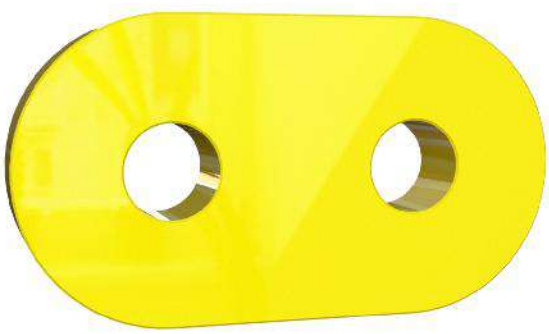
- WLL: from 155t to 1.500t.
- Y Link, H Link, Twin Plate and Double Pin Connector FORGED and HEAT TREATED.
- Material: carbon steel, alloy and super alloy. Most regular super alloy steel (R4).
- Coating Protection: upon request.
- General Tolerances: +/-5% forged parts and machined parts +/-1%.
- Safety Factor: min. 4:1.
- Load test requested and recommended. ILO-3, FAT or Breaking Test available upon request.
- Certificate: EN10204-3.1. For 3.2, Mooring Accessory Cert with ABS and DNV upon request (see annex 3 and 4).

6.3.1 Y LINKS

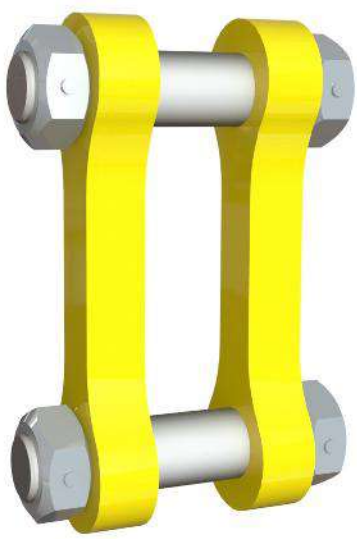
6.3.2 H LINKS



6.3.3 TWIN PLATE



6.3.4 DOUBLE PIN CONNECTOR



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Annex 1

CRANE GENERAL INFORMATION (EN13001-1, EN13001-2)

CRANE PROPERTIES

Crane Type	
Dispositive Hoisting Type	
Hoisting Device Type & Starting Method	
Maximum Constant Hoisting Speed (vh,max) [m/s]	
Constant Hoisting Creep Speed (vh,CS) [m/s]	
Maximum Traslation Acceleration[m/s2]	
Maximum Distribution Acceleration [m/s2]	
Maximum Vertical (Drag) Acceleration[m/s2]	
Drag Device Acceleration Force	
Articulation Type	
Tilting Resistance Factor for Balanced Rope Reeving(Ct)	
Maximum Deliberated Hook Suspension Inclination (β) [º]	

TEMPERATURE FACTORS

Operation Temperature [ºC]	

APPLICATION FACTORS

Risk Factor (n r)	

MASS FACTORS

Mass of the rated hook load (mRC)[kg]	
Total Hook Load with Release device (m H)[kg]	
Maximum Hoisting Load [kg]	

WIND FACTORS

Wind Range in Service	
European Wind Location	
Out of Service (OS) Wind Interval [R] [years]	
Maximum Load Heigth to the Surrounding Ground OS cond.(m)	
Load Percentage for Out of Service Condition (ηW)	

FATIGUE DESIGN FACTORS

Fatigue Operation Temperature [ºC]	
Mass of the Hook Load in a Lifting Cycle (mi) [kg]	
Class Q Parameter	
Class U Parameter	
Average Number of accelerations per Cycle	
Total Number of Lifting Cycles	

ADDITIONAL LOAD OPTIONS

LOAD RELEASE FACTORS

Apply Fast Load Release?	
Load Release Speed	
Release Load Percentage [%]	
Load Release Device Mass [kg]	

TRANSLATION FACTORS

Irregular Traslation surface?	
Factor ϕ4 (EN13001-2)	

SNOW & ICE FACTORS

Apply Snow and Ice Loads?	
Load Horizontal Area Projection (mm)	
Snow or Ice Build-up Thickness (mm)	

EARTHQUAKE FACTORS

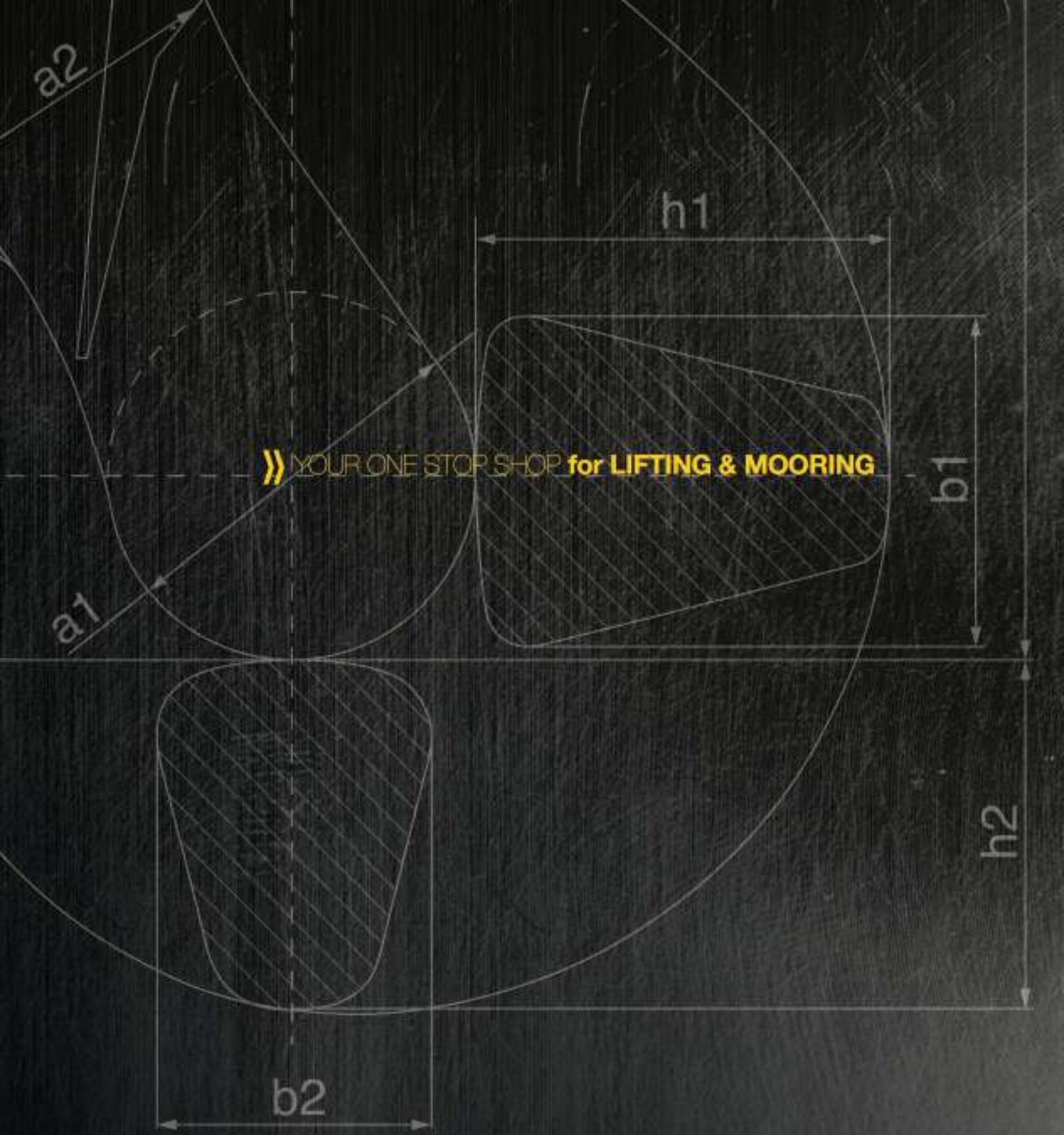
Apply Earthquake Loads?	
Máximum Vertical Acceleration due to Earthquake [m/s2]	

Annex 2

DIN 15400 Drive Groups

This table specifies the drive group as a function of hook strength class and the lifting capacity as a function of hook number.

Strength class	Drive group [1]										Strength class
M	Hooks used in a drive group lower				$1B_m$	$1A_m$	2_m	3_m	4_m	5_m	M
P	than $1B_m$ are not included			$1B_m$	$1A_m$	2_m	3_m	4_m	5_m	-	P
S	here.		$1B_m$	$1A_m$	2_m	3_m	4_m	5_m	-	-	S
T		$1B_m$	$1A_m$	2_m	3_m	4_m	-	-	-	-	T
V	$1B_m$	$1A_m$	2_m	3_m	4_m	-	-	-	-	-	V
Hook Number	Lifting capacity, in kg										Hook number
006	320	250	200	160	125	100	-	-	-	-	006
010	500	400	320	250	200	160	125	100	-	-	010
012	630	500	400	320	250	200	160	125	100	-	012
020	1000	800	630	500	400	320	250	200	160	125	020
025	1250	1000	800	630	500	400	320	250	200	160	025
04	2000	1600	1250	1000	800	630	500	400	320	250	04
05	2500	2000	1600	1250	1000	800	630	500	400	320	05
08	4000	3200	2500	2000	1600	1250	1000	800	630	500	08
1	5000	4000	3200	2500	2000	1600	1250	1000	800	630	1
1.6	8000	6300	5000	4000	3200	2500	2000	1600	1250	1000	1.6
2.5	12500	10000	8000	6300	5000	4000	3200	2500	2000	1600	2.5
4	20000	16000	12500	10000	8000	6300	5000	4000	3200	2500	4
5	25000	20000	16000	12500	10000	8000	6300	5000	4000	3200	5
6	32000	25000	20000	16000	12500	10000	8000	6300	5000	4000	6
8	40000	32000	25000	20000	16000	12500	10000	8000	6300	5000	8
10	50000	40000	32000	25000	20000	16000	12500	10000	8000	6300	10
12	63000	50000	40000	32000	25000	20000	16000	12500	10000	8000	12
16	80000	63000	50000	40000	32000	25000	20000	16000	12500	10000	16
20	100000	80000	63000	50000	40000	32000	25000	20000	16000	12500	20
25	125000	100000	80000	63000	50000	40000	32000	25000	20000	16000	25
32	160000	125000	100000	80000	63000	50000	40000	32000	25000	20000	32
40	200000	160000	125000	100000	80000	63000	50000	40000	32000	25000	40
50	250000	200000	160000	125000	100000	80000	63000	50000	40000	32000	50
63	320000	250000	200000	160000	125000	100000	80000	63000	50000	40000	63
80	400000	320000	250000	200000	160000	125000	100000	80000	63000	50000	80
100	500000	400000	320000	250000	200000	160000	125000	100000	80000	63000	100
125	*630000*	500000	400000	320000	250000	200000	160000	125000	100000	80000	125
160	*800000*	*630000*	500000	400000	320000	250000	200000	160000	125000	100000	160
200	*1000000*	*800000*	*630000*	500000	400000	320000	250000	200000	160000	125000	200
250	*1250000*	*1000000*	*800000*	*630000*	500000	400000	320000	250000	200000	160000	250



» YOUR ONE STOP SHOP for LIFTING & MOORING

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