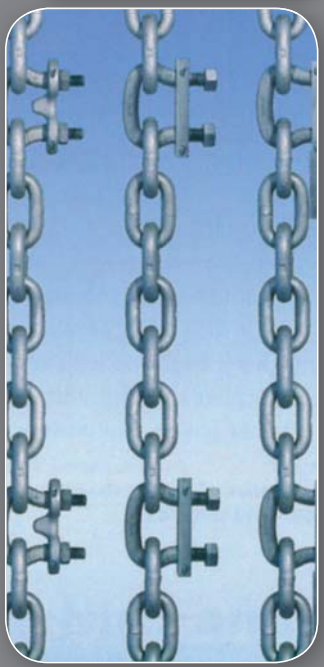
D - Bucket elevator chains and components









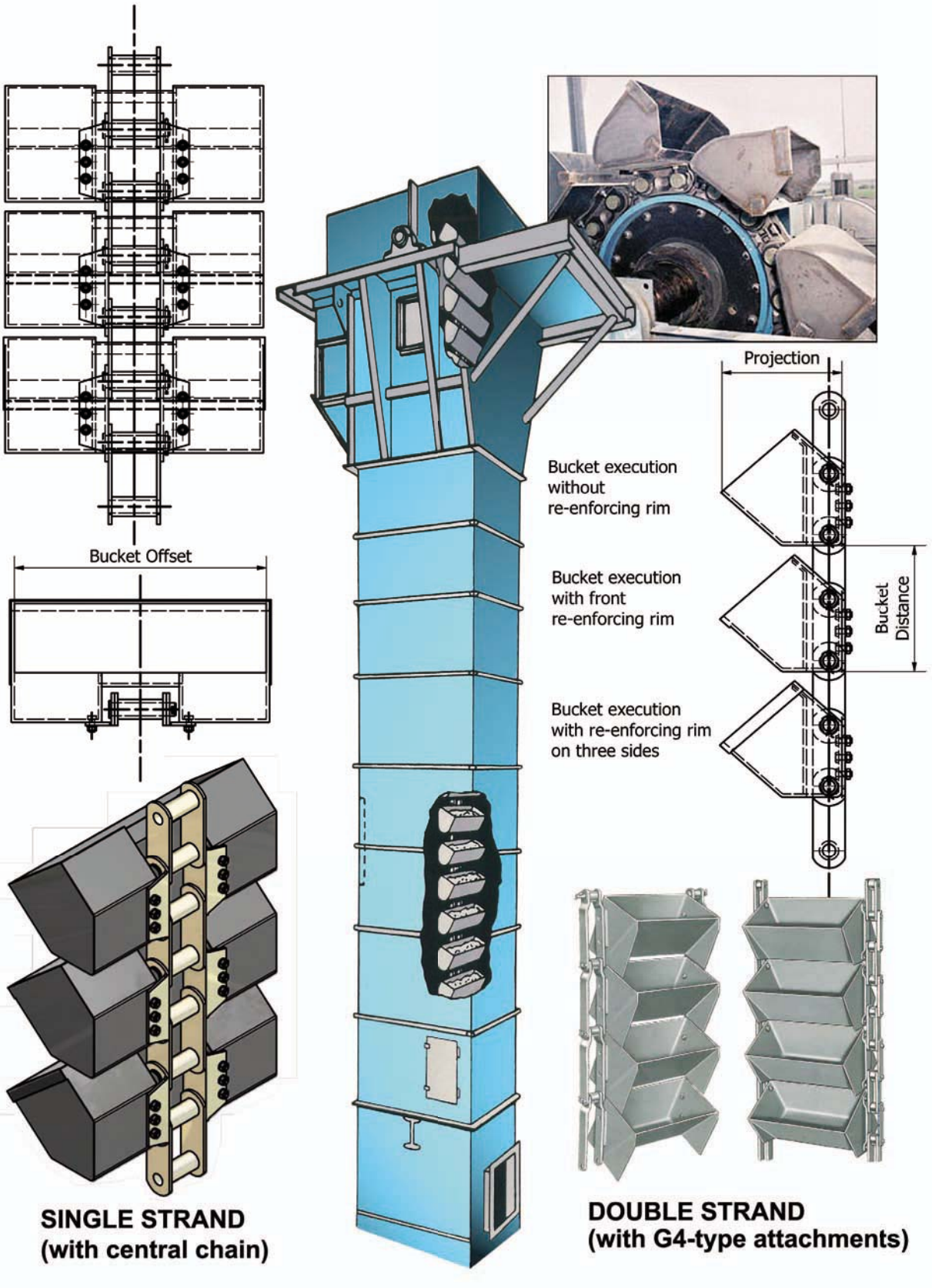


D - Bucket elevator chains and components
- LGH bearings
- Buckets
- Sprockets
- Shackles

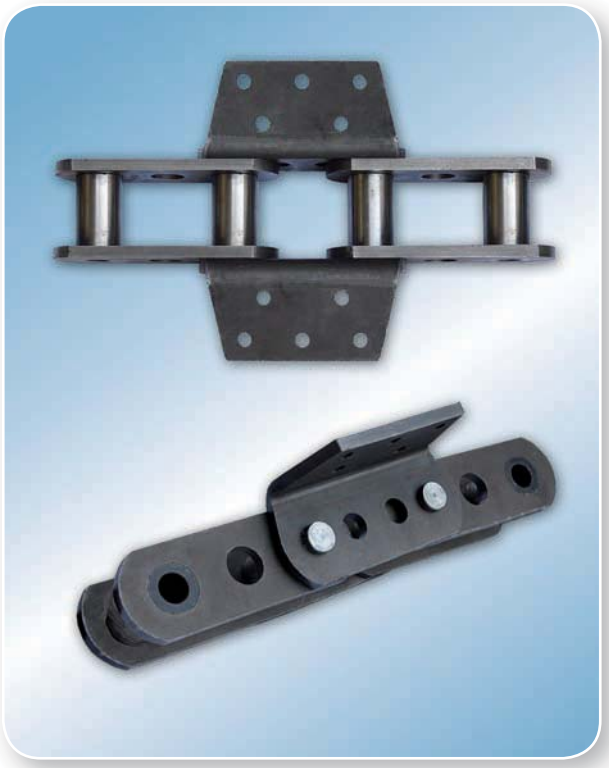
- General scope (single and double strand chains — D2
- Technical data for centrifugal discharging by central chain — D3
- Central chains for bucket elevators — D4 - D5
- Double strand chains for gravity discharge — D6 - D13
- LGH slide bearings for gravity take-up system — D14 - D15
- Installation & maintenance manual — D16
- Dimensions and technical data for round link chains — D18 - D20
- Technical data for bucket elevator attachments chain sprockets type TS/TS-N/TS-L and according DIN 5699 - DIN 745 — D21 - D22
- Endless chain system type TS, TS-N and TS-L — D23 - D24
- Chain wheels with pocket teeth-replaceable-GTA — D25
- Toothless chain wheels — D26
- Toothed sprockets — D27
- Installation and maintenance manual and recommended torque settings & bulk densities — D28
- Buckets and technical data for DIN 5699 - DIN 745 — D29 - D34
- Toothless chain wheels type RUP & RUU — D35 - D36
- Example of bucket elevator sizing — D37
- General technical information — D38
- Wear calculation — D39
- View on products in our range — D40

Components for:

- Bucket-elevators
- Pin-bush-roller fabricated conveyor chains



Bucket elevator – centrifugal discharging (central chain)



Technical data for bucket-elevators - Continuous discharge

Elevator No.	Capacity m3/h. (*)	Bucket			Chain	Speed	Head-sprocket		Boot-sprocket		Casing section
		Dimension mm	Type	Spacing	Nr.	m/sec.	Ø	rpm/min.	Z - Pc Ø (***)	Ø shaft (**)	mm
1608-01	8	203x127	AA	483	GHS-111	1,19	559	40	11-429	62	356x1120
1610-01	17	254x152	AA	483	GHS-111	1,35	660	37	16-620	62	406x1270
1612-01	54	305x203	AC	483	GHS-111	1,30	660	36	16-620	62	508x1420
1612-02	85	305x203	AC	305	GHR-856	1,30	660	36	13-637	75	508x1420
1616-02	110	406x203	AC	305	GHR-856	1,30	660	36	13-637	75	610x1420
1618-02	190	457x254	AC	305	GHR-857	1,27	660	34	13-637	75	711x1630
1624-02	265	610x254	AC	305	GHR-859	1,27	660	34	13-637	87	864x1630
1616-24	280	406x356	ACS	356	GHR-864	1,55	762	36	13-742	87	610x1630
1618-24	325	457x356	ACS	356	GHR-864	1,55	762	36	13-742	87	711x1630
1627-01	370	686x279	ACS	356	GHR-864	1,27	660	34	12-637	87	940x1730
1621-24	395	534x356	ACS	356	GHR-864	1,55	762	36	13-742	87	762x1650
1624-24	460	610x356	ACS	356	GHR-864	1,55	762	36	13-742	87	865x1650
1627-24	550	686x381	ACS	356	GHR-864	1,55	762	36	15-855	87/100	950x1860

For higher capacities, please contact us.

(*) Filling degree 100%

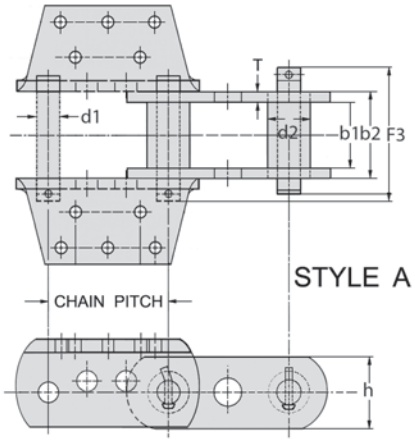
(**) shaft-end Ø

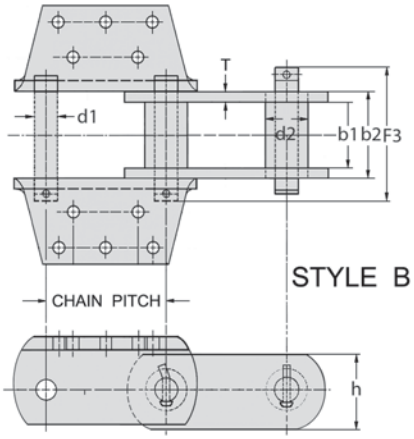
(***) Z = number of teeth

PC Ø = pitch circle Ø

Bucket-elevator – central chains

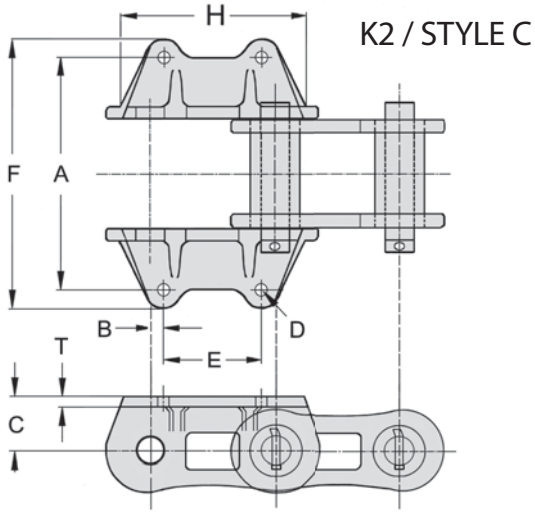
(single strand – also as double strand for very large buckets)

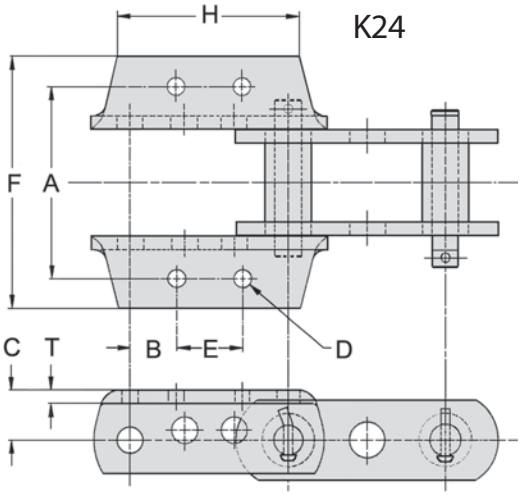




TYPE	PITCH	STYLE	b1	b2	d1	d2	h	s	F3
GH856	152,4	B	76,2	102	25,4	44,5	63,5	12	164
GH956	152,4	A	76,2	102	25,4	44,5	76,2	12	164
GH857	152,4	B	76,2	102	25,4	44,5	83,6	12	164
GH958	152,4	A	76,2	105	28,6	50,8	83,6	16	164
GH859	152,4	B	95,3	127	31,8	60,5	102	16	197
GH864	177,8	B	95,3	127	31,8	60,5	102	16	197
GH984	177,8	A	95,3	127	34,9	63,5	102	16	197
GH1084	177,8	C	112,5	152	41,1	72,4	114,3	16	218

- dimensions in mm
- sidebars heat-treated 900-1000 N/mm2
- bushings alloy steel case-hardened
- pins alloy steel trough hardened 1150-1300N/mm2 and induction-hardened



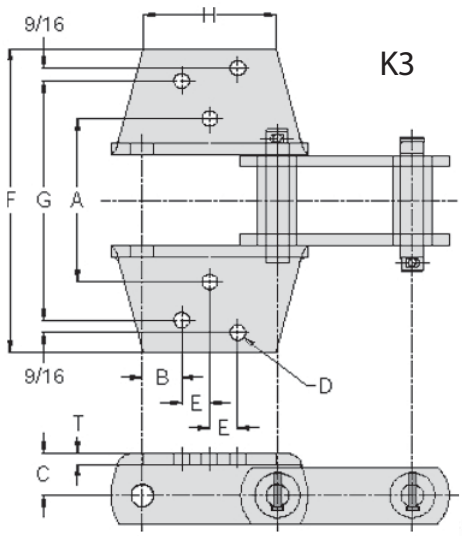


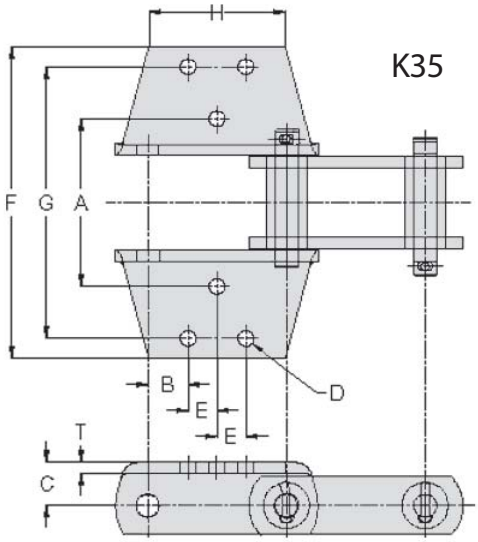
TYPE	ATTACHM.	A	B	C	D	E	H	T	Weight lbs/ft* Weight kg/m*
GH1084	K2	13,00	0,75	3,00	0,69	5,50	-	0,5	51,9
		300	19,1	73,2	17,5	139,7	-	12	77,4
GH856	K24	7,25	1,75	1,88	0,69	2,5	3,91	0,5	27,8
		184	44,5	47,8	17,5	63,5	176	12	41,5
GH956	K24	7,25	1,75	1,88	0,69	2,5	3,91	0,5	29,3
		184	44,5	47,8	17,5	63,5	176	12	43,7

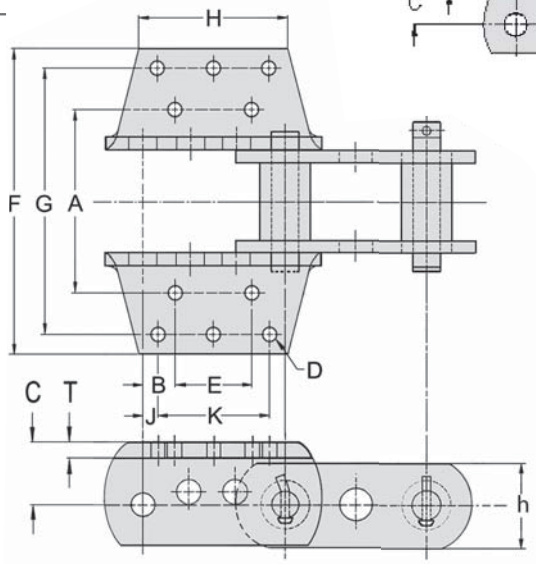
- Sprockets with replaceable segments in all sizes available.

*assumed attachments are every 2nd pitch

Centrifugal elevator chain attachments



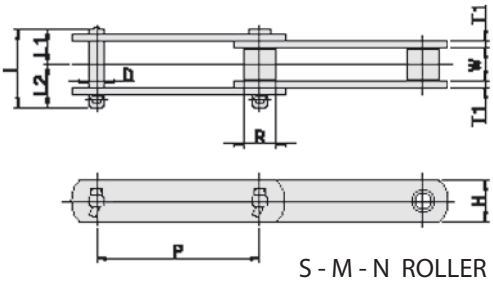




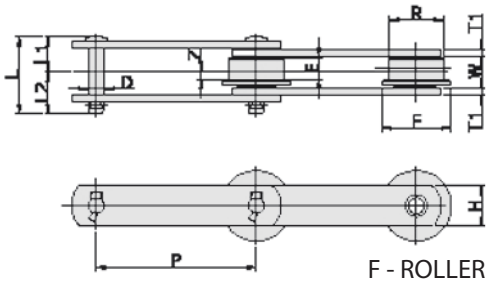
Chain No.	Attachment style	A	B	C	D	E	F	G	H	J	K	T	Weight lbs/ft* Weight kg/m*
GH856	K3	6.56	1.63	1.88	0.50	1.38	13.56	10.54	4.25			0.50	27.2
		167	41.4	47.8	12.7	35.1	344	278	108			12.7	40.5
GH956	K35	7.25	1.75	1.88	0.69	1.25	13.5	11.75	5.88			0.50	27.2
		184	44.5	47.8	17.5	31.8	343	298	149			12	40.5
GH857	K44	7.00	1.25	2.50	0.56	3.50	14.00	12.00	5.50	1.25	3.50	0.50	38.6
		178	32	64	14	89	356	305	140	31.8	88.9	12	57.6
GH859	K44	9.00	1.62	3.00	0.69	2.75	15.00	13.00	5.92	0.75	4.50	0.62	59.6
		229	41.1	76.2	17.5	69.9	381	330	150	19.1	114	16	88.9
GH958	K44	7.00	1.25	2.50	0.56	3.50	13.68	12.00	5.75	1.25	3.50	0.50	40.7
		178	31.8	63.5	14.2	88.9	347	305	146	31.8	88.9	12	60.7
GH864	K443	9.00	1.62	3.00	0.69	3.75	15.00	13.00	7.00	0.75	5.50	0.62	55.3
		229	41.1	76.2	17.5	95.3	381	330	178	19.1	140	16	82.5
GH984	K443	9.00	1.62	3.00	0.69	3.75	14.88	13.00	7.32	0.75	5.50	0.62	58.6
		229	41.1	76.2	18.5	95.3	378	330	178	19.1	140	16	87.4

All attachments are trough-hardened.
*Assumes attachments are every second pitch.
Dimensions and weights are shown in inches and lb./fl. Shaded dimensions and weights are millimeters and kg/M.
Dimensions are subject to change. Certified drawings are supplied upon request.

Double strand chains



S - M - N ROLLER

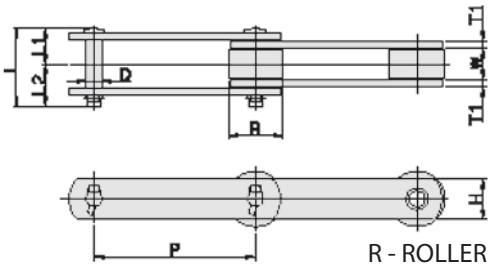


F - ROLLER

Chain No.		Roller Type	Pitch	Inner width	Plate		Pin				Avg. Breaking Load kg/t	
			P	W	T	H	D	L1	L2	L	Standard Type	Heavy Type
GHG	03075 03100 03150	R - F - S	75 100 150	16,1	3,2	22	7,9	17,5	19,5	37	3.000	7.100
GHG	430	R -S	101,6	22,6	4,8(5,0)	25,4	9,7	25,5	29,5	55	5.500	10.000
GHG	05075 05100 05150	S R - F - S R - F - S	75 100 150	22	4,5	32	11,1	24,6	29,6	54,2	7.000	14.500
GHG	204	S	66,27	27	6,3(6,0)	28,6	11,1	30,7	35,6	66,3	8.000	14.500
GHG	450	R - F - S - M	101,6	27	6,3(6,0)	28,6	11,1	30,7	35,6	66,3	8.000	14.500
GHG	08125 08125	R - F - S - M	125 150	27	6,3(6,0)	28,6	11,1	30,7	35,6	66,3	8.000	14.500
GHG	650	R - F - S - M	152,4	30,2	6,3(6,0)	38,1	11,1	32,3	37,3	69,6	8.000	14.500
GHG	10100 10125 10150	R - S - M R - F - S - M R - F - S - M	100 125 150	30	6,3(6,0)	38,1	14,3	32,7	39,2	71,9	11.500	23.000
GHG	214	R - S - M	101,6	31,6	7,9	38,1	15,9	37,2	43,7	80,9	13.000	24.500
GHG	205	S	78,11	37,1	7,9	38,1	15,9	40	46,4	86,4	13.000	24.500
GHG	6205	R - F - S - M	152,4	37,1	7,9	44,5	15,9	40	46,4	86,4	19.000	28.500
GHG	12200 12250	R - F - S - M	200 250	37,1	7,9	44,5	15,9	40	46,4	86,4	19.000	28.500
GHG	17200 17250 17300	R - F - S - M	200 250 300	51,4	9,5(10,0)	50,8	19,05	51,5	60	111,5	25.000	39.500
GHG	212	R - S - M	152,4	37,1	9,5(10,0)	50,8	19,05	44,2	57,7	96,9	21.000	39.500
GHG	26200 26250 26300 26450	S - M R - F - S - M R - F - S - M R - F - S - M	200 250 300 450	57,2	9,5(10,0)	63,5	22,2	55,2	62,7	117,9	32.000	53.000
GHG	36250 36300 36450 36600	S - M R - F - S - M R - F - S - M R - F - S - M	250 300 450 600	66,7	12,7	76,2	25,4	68	76	144	48.500	69.500
GHG	52300 52450 52600	R - F - S	300 450 600	77	16	76,2	31,8	81,5	91,5	173	54.000	105.000
GHG	60300 60350 60400	R - F - N	300 350 400	77	12,7	90	35	77	84	161	62.000	106.000
GHG	90350 90400 90500	N R - F - N R - F - N	350 400 500	88	16	110	42	90	100	190	95.000	166.000
GHG	120400 120600	R - N R - F - N	400 600	100	19	130	50	106	113	219	113.000	225.000

Numbers in brackets of the Link Plate thickness indicates the Stainless Steel 300 Series.
The Number outside brackets is common for every series.

Double strand chains

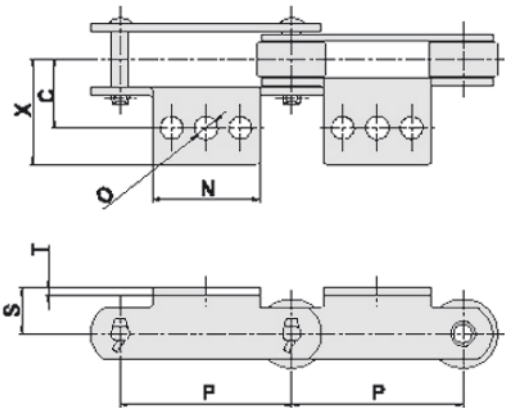


R - ROLLER

Chain No.		Roller Type	Roller Dimensions													Weight of Rollers (kg/m)			
			R-Roller		F-Roller					S- Roller		M-Roller		N-Roller		Roller	Roller	Roller	Roller
			R	E	R	F	E	e	Z	R	E	R	E	R	E	R	F	S	M,N
GHG	03075 03100 03150	R - F - S	31,8	15,5	31,8	42	12	1,8	4,3	15,9	15,5	-	-	-	-	2,7 2,3	2,8 2,4	1,9 1,7	-
GHG	430	R -S	38,1	19	-	-	-	-	-	20,1	19	-	-	-	-	4,3	-	3,0	-
GHG	05075 05100 05150	S R - F - S R - F - S	40	19	40	50	14	2,5	4,5	22,2	19	-	-	-	-	5,0 4,5 4,1	5,2 4,6 4,2	4,2 3,7 3,2	-
GHG	204	S	-	-	-	-	-	-	-	22,2	23	25,4	23	-	-	-	-	5,6	-
GHG	450	R - F - S - M	44,5	23	44,5	55	18	2,5	6,5	22,2	23	25,4	23	-	-	6,8	7,5	4,6	4,8
GHG	08125 08125	R - F - S - M	44,5	23	44,5	55	18	2,5	6,5	22,2	23	25,4	23	-	-	6,1	6,3	4,3	4,5
GHG	650	R - F - S - M	50,8	26	50,8	65	20	3	7	25,4	26	31,8	26	-	-	7,7	8,0	6,0	6,4
GHG	10100 10125 10150	R - S - M R - F - S - M R - F - S - M	50,8	27	50,8	65	20	3	7	29	27	31,8	27			9,8 8,7 7,9	- 8,9 8,1	6,8 6,3 5,9	7,1 6,5 6,1
GHG	214	R - S - M	44,5	27	-	-	-	-	-	31,8	27	34,9	27	-	-	10,4	-	8,7	9,1
GHG	205	S	-	-	-	-	-	-	-	31,8	27	-	-	-	-	12,1	12,4	9,3	9,6
GHG	6205	R - F - S - M	57,2	32	57,2	70	25	3,5	9	34,9	32	38,1	32	-	-	12,1	12,4	9,3	9,6
GHG	12200 12250	R - F - S - M	65	32	65	80	24	4	8	34,9	32	38,1	32			11,4 10,3	11,9 10,6	8,4 7,8	8,7 8,0
GHG	17200 17250 17300	R - F - S - M	80	44	80	100	34	5	12	40,1	44	44,4	44	-	-	18,8 16,5 15,0	19,8 17,3 15,7	12,0 11,1 10,5	12,6 11,6 10,9
GHG	212	R - S - M	69,9	32,5	-	-	-	-	-	40,1	32,5	44,4	32,5			17,1	-	12,6	13,1
GHG	26200 26250 26300 26450	S - M R - F - S - M R - F - S - M R - F - S - M	100	50	100	125	38	6	13	44,5	50	50,8	50	-	-	- 25,3 22,3 18,0	- 26,2 23,6 18,9	16,0 14,7 13,8 12,4	17,0 15,5 14,5 12,9
GHG	36250 36300 36450 36600	S - M R - F - S - M R - F - S - M R - F - S - M	125	56	125	150	42	7	14	50,8	56	57,2	56	57,2	65	- 39,0 30,7 26,9	- 40,1 31,9 27,8	24,4 22,9 20,2 18,0	25,5 23,8 20,8 19,5
GHG	52300 52450 52600	R - F - S	140	65	140	170	49	8	16,5	57,2	65	-	65	-	-	48,8 37,5 32,9	52,5 39,3 34,3	29,7 26,2 24,4	- - -
GHG	60300 60350 60400	R - F - N	140	68	140	170	49	8	16,5	-	-	-	68	70	75	52,4 47,2 43,8	55,1 49,5 45,8	- - -	31,0 28,8 27,7
GHG	90350 90400 90500	N R - F - N R - F - N	170	76	170	205	56	10	18	-	-	-	76	85	86	- 66,9 59,0	- 71,6 62,8	- - -	42,4 40,8 38,1
GHG	120400 120600	R - N R - F - N	200	87	200	240	64	11,5	20,5	-	-	-	87	100	97	105,7 83,8	- 88,0	- -	63,9 55,4

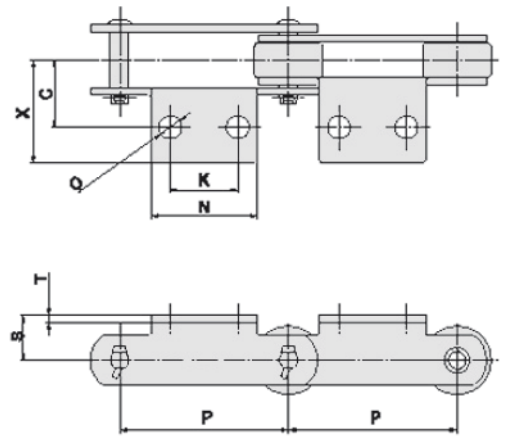
Double strand chains with attachments

A-1 Attachment



Chain No.		Roller Type	Pitch	Dimensions						add. Weight per Attachm. (kg)
			P	S	C	X	N	T	O	
GHG	03075 03100	R - F - S R - F - S	75 100	20	30	46	55 65	3,2	10	0.05 0.06
GHG	430	R -S	101,6	22	40	54	70	4,8(5,0)	12	0.11
GHG	05075 05100 05150	S R - F - S R - F - S	75 100 150	22	35	47	55 65 85	4,5	10	0.03 0.08 0.10
GHG	204	S	66,27	24	45	59	35	6,3(6,0)	12	0.08
GHG	450	R - F - S - M	101,6	28	50	64	70	6,3(6,0)	12	0.18
GHG	08150	R - F - S - M	150	28	50	64	90	6,3(6,0)	12	0.22
GHG	650	R - F - S - M	152,4	32	50	64	90	6,3(6,0)	12	0.22
GHG	10100 10150	R - S - M R - F - S - M	100 150	28	50	65	70 90	6,3(6,0) 6,3(6,0)	12	0.16 0.20
GHG	214	R - S - M	101,6	35	55	73	80	7,9	15	0.28
GHG	6205	R - F - S - M	152,4	38	60	79	100	7,9	15	0.37
GHG	12200 12250	R - F - S - M R - F - S - M	200 250	38	60	79	120 165	7,9	15	0.45 0.62
GHG	212	R - S - M	152,4	45	65	83	100	9,5(10,0)	15	0.49
GHG	17200 17250	R - F - S - M R - F - S - M	200 250	45	75	98	120 165	9,5(10,0)	15	0.66 0.79

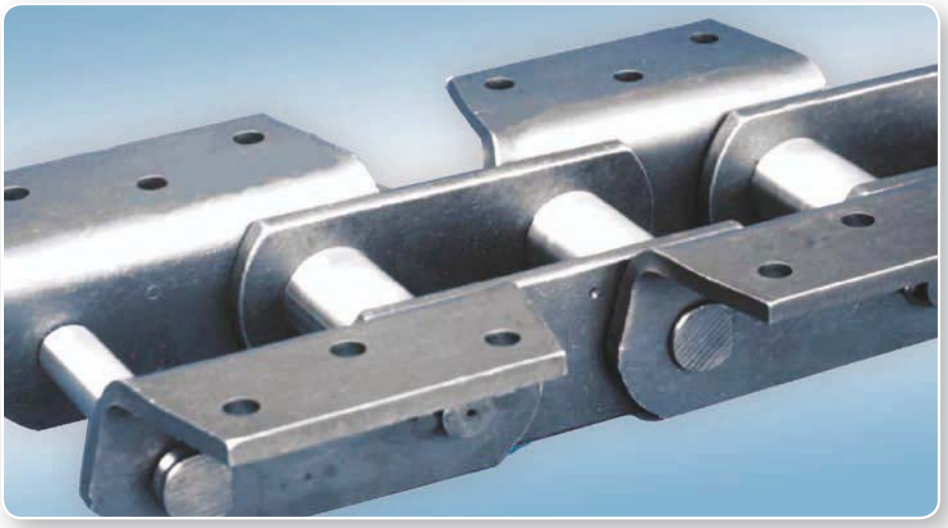
A-2 Attachment



Chain No.		Roller Type	Pitch	Dimensions							add. Weight per Attachm. (kg)
			P	S	C	X	N	K	T	O	
GHG	03075 03100	R - F - S	75 100	20	30	46	55 65	30 40	3,2	10	0.05 0.06
GHG	430	R -S	101,6	22	40	54	70	40	4,8(5,0)	12	0.11
GHG	05075 05100 05150	S R - F - S R - F - S	75 100 150	22	35	47	55 65 85	30 40 60	4,5	10	0.07 0.08 0.10
GHG	204	S	66,27	24	45	59	35	35	6,3(6,0)	12	0.13
GHG	450	R - F - S - M	101,6	28	50	64	70	40	6,3(6,0)	12	0.18
GHG	08150	R - F - S - M	150	28	50	64	90	60	6,3(6,0)	12	0.22
GHG	650	R - F - S - M	152,4	32	50	64	90	60	6,3(6,0)	12	0.22
GHG	10100 10150	R - S - M R - F - S - M	100 150	28	50	65	70 90	40 60	6,3(6,0) 6,3(6,0)	12	0.16 0.20
GHG	214	R - S - M	101,6	35	55	73	80	40	7,9	15	0.28
GHG	205	S	78,11	35	60	75	65	30			0.23
GHG	6205	R - F - S - M	152,4	38	60	79	100	60	7,9	15	0.37
GHG	12200 12250	R - F - S - M R - F - S - M	200 250	38	60	79	120 165	80 125	7,9	15	0.45 0.62
GHG	212	R - S - M	152,4	45	65	83	100	60	9,5(10,0)	15	0.49
GHG	17200 17250	R - F - S - M R - F - S - M	200 250	45	75	98	120 165	80 125	9,5(10,0)	15	0.66 0.79
GHG	26200 26250	S - M R - F - S - M	200 250	55 55	80 80	108 108	120 165	80 125	9,5(10,0) 9,5(10,0)	15 15	0.78 1.07

Numbers in brackets of the Link Plate thickness indicates the Stainless Steel 300 Series.
The Number outside brackets is common for every series.

Chains for the cement industry and other

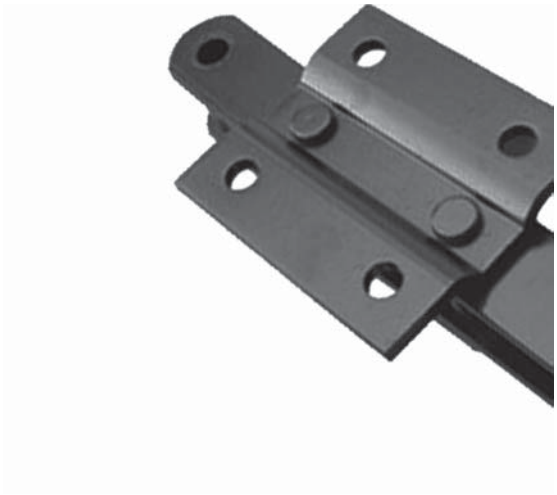


Chain for single strand chain-bucket elevator

Conveyor chains with plate attachments on one side for fixing buckets

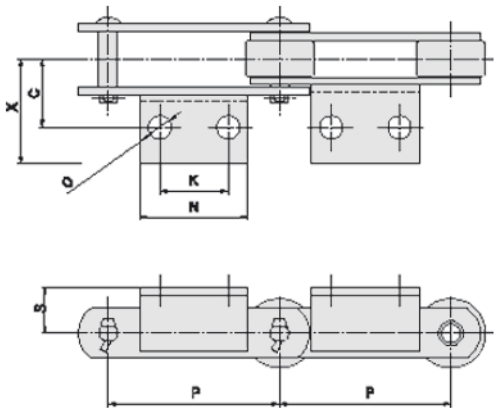
Double strand chains with attachments

A-2 Attachment (Welded Type)



Chain No.		Roller Type	Pitch	Dimensions						Compatible Angle	add. Weight per Attachm. (kg)
			P	S	C	X	N	K	O		
GHG	17300	R - F - S - M	300	45	75	110,5	220	180	15	L65x65x6	1.34
GHG	26300 26450	R - F - S - M R - F - S - M	300 450	55	80	123,5	220 320	180 280	15	L75x75x9	2.22 3.26
GHG	36300 36450 36600	R - F - S - M R - F - S - M R - F - S - M	300 450 600	70	100	160	160 330 410	100 280 360	19	L100x100x10	2.50 5.07 6.26
GHG	52300 52450 52600	R - F - S R - F - S R - F - S	300 450 600	80	120	171,4	160 330 410	100 280 360	24	L100x100x13	3.10 6.30 7.80
GHG	60300 60350 60400	R - F - N R - F - N R - F - N	300 350 400	90	115	165	170 220 260	110 160 200	24	L100x100x13	3.30 4.20 6.00
GHG	90350 90400 90500	N R - F - N R - F - N	350 400 500	100	140	210	180 230 340	100 150 260	28	L130x130x15	5.20 6.60 9.80
GHG	120400 120600	R - N R - F - N	400 600	120	150	220	200 400	120 320	28	L160x130x15	5.80 11.50

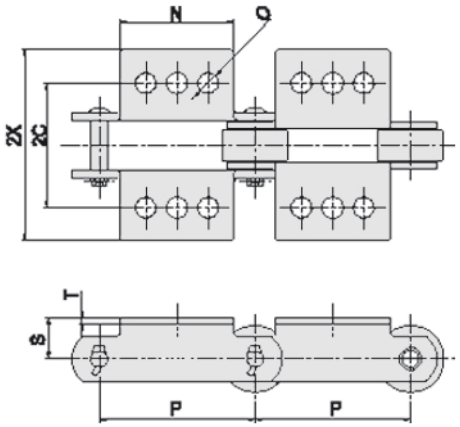
A-3 Attachment (Welded Type)



Chain No.		Roller Type	Pitch	Dimensions						Compatible Angle	add. Weight per Attachm. (kg)
			P	S	C	X	N	K	O		
GHG	17300	R - F - S - M	300	45	75	110,5	220	180	15	L65x65x6	1.34
GHG	26450	R - F - S - M	450	55	80	123,5	320	140	15	L75x75x9	3.26
GHG	36450 36600	R - F - S - M R - F - S - M	450 600	70	100	160	330 410	140 180	19	L100x100x10	5.07 6.26
GHG	52450 52600	R - F R - F	450 600	80	120	171,4	330 410	140 180	24	L100x100x13	6.30 7.80
GHG	60350 60400	R - F - N R - F - N	350 400	90	115	165	220 260	80 100	24	L100x100x13	4.20 6.00
GHG	90500	R - F - N	500	100	140	210	340	130	28	L130x130x15	9.80
GHG	120600	R - F - N	600	220	150	200	400	160	28	L130x130x15	11.50

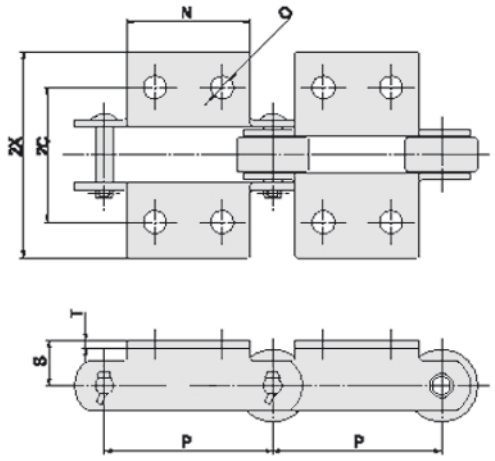
Double strand chains with attachments

K-1 Attachment



Chain No.		Roller Type	Pitch	Dimensions							add. Weight per Attachm. (kg)
			P	S	2C	2X	N	T	O	
GHG	03075 03100	R - F - S	75 100	20	60	92	55 65	3,2	10	0.10 0.12
GHG	430	R - S	101,6	22	80	108	70	4,8(5,0)	12	0.22
GHG	05075 05100 05150	S R - F - S R - F - S	75 100 150	22	70	94	55 65 85	4,5	10	0.06 0.16 0.20
GHG	204	S	66,27	24	90	118	35	6,3(6,0)	12	0.16
GHG	450	R - F - S - M	101,6	28	100	128	70	6,3(6,0)	12	0.36
GHG	08150	R - F - S - M	150	28	100	128	90	6,3(6,0)	12	0.44
GHG	650	R - F - S - M	152,4	32	100	128	90	6,3(6,0)	12	0.44
GHG	10100 10150	R - S - M R - F - S - M	100 150	28	100	130	70 90	6,3(6,0) 6,3(6,0)	12	0.32 0.40
GHG	214	R - S - M	101,6	35	110	146	80	7,9	15	0.56
GHG	6205	R - F - S - M	152,4	38	120	158	100	7,9	15	0.74
GHG	12200 12250	R - F - S - M R - F - S - M	200 250	38	120	158	120 165	7,9	15	0.90 1.24
GHG	212	R - S - M	152,4	45	130	166	100	9,5(10,0)	15	0.98
GHG	17200 17250	R - F - S - M R - F - S - M	200 250	45	150	196	120 165	9,5(10,0)	15	1.32 1.58

K-2 Attachment

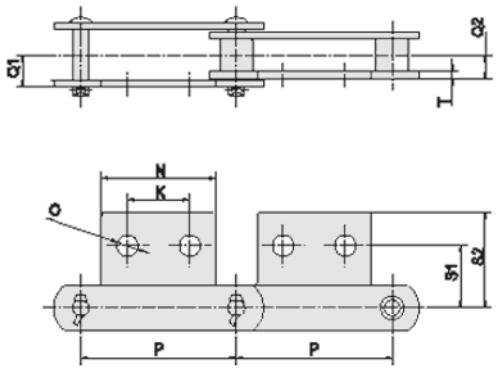


Chain No.		Roller Type	Pitch	Dimensions							add. Weight per Attachm. (kg)
			P	S	2C	2X	N	K	T	O	
GHG	03075 03100	R - F - S	75 100	20	60	92	55 65	30 40	3,2	10	0.10 0.12
GHG	430	R -S	101,6	22	80	108	70	40	4,8(5,0)	12	0.22
GHG	05075 05100 05150	S R - F - S R - F - S	75 100 150	22	70	94	55 65 85	30 40 60	4,5	10	0.14 0.16 0.20
GHG	204	S	66,27	24	90	118	35	35	6,3(6,0)	12	0.26
GHG	450	R - F - S - M	101,6	28	100	128	70	40	6,3(6,0)	12	0.36
GHG	08150	R - F - S - M	150	28	100	128	90	60	6,3(6,0)	12	0.44
GHG	650	R - F - S - M	152,4	32	100	128	90	60	6,3(6,0)	12	0.44
GHG	10100 10150	R - S - M R - F - S - M	100 150	28	100	130	70 90	40 60	6,3(6,0) 6,3(6,0)	12	0.32 0.40
GHG	214	R - S - M	101,6	35	110	146	80	40	7,9	15	0.56
GHG	205	S	78,11	35	120	150	65	30	7,9	12	0.46
GHG	6205	R - F - S - M	152,4	38	120	158	100	60	7,9	15	0.74
GHG	12200 12250	R - F - S - M R - F - S - M	200 250	38	120	158	120 165	80 125	7,9	15	0.90 1.24
GHG	212	R - S - M	152,4	45	130	166	100	60	9,5(10,0)	15	0.98
GHG	17200 17250	R - F - S - M R - F - S - M	200 250	45	150	196	120 165	80 125	9,5(10,0)	15	1.32 1.58
GHG	26200 26250	S - M R - F - S - M	200 250	55 55	160 160	216 216	120 165	80 125	9,5(10,0) 9,5(10,0)	15 15	1.56 2.14

Numbers in brackets of the Link Plate thickness indicates the Stainless Steel 300 Series.
The Number outside brackets is common for every series.

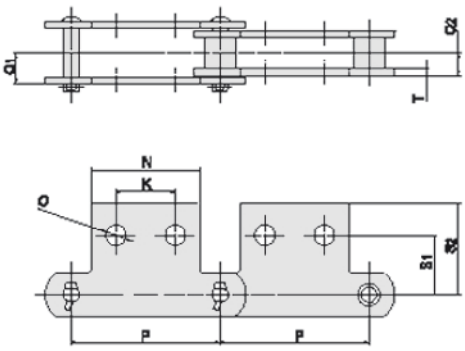
Double strand chains with attachments

SA-2 Attachment



Chain No.		Roller Type	Pitch	Dimensions								add. Weight per Attachm. (kg)
			P	S1	S2	Q1	Q2	K	N	T	O	
GHG	03075 03100	R - S	75 100	33	49	15,5	11,5	30 40	55 65	3,2	10	0.05 0.06
GHG	430	R - S	101,6	37,6	51,6	22(22,5)	16(16,5)	40	70	4,8(5,0)	12	0.11
GHG	05100 05150	R - S R - S	100 150	33,4	50,7	21	15,5	40 60	65 85	4,5	10	0.08 0.10
GHG	450	R - S - M	101,6	47,6	60,7	27(28,5)	20(19,5)	40	70	6,3(6,0)	12	0.18
GHG	08150	R - S - M	150	46,1	58,7	27(26,5)	20(19,5)	60	90	6,3(6,0)	12	0.22
GHG	650	R - S - M	152,4	50	63	28,5(28)	21,5(21)	60	90	6,3(6,0)	12	0.22
GHG	10100 10150	R - S - M R - S - M	100 150	46,1	61	28,5(28)	21,5(21)	40 60	70 90	6,3(6,0) 6,3(6,0)	12	0.16 0.20
GHG	214	R - S - M	101,6	50	70	32,5	23,5	40	80	7,9	15	0.28
GHG	6205	R - S - M	152,4	55	75,7	35,5	26,5	60	100	7,9	15	0.37
GHG	12200 12250	R - S - M R - S - M	200 250	55	75,7	35,5	26,5	80 125	120 165	7,9	15	0.45 0.62
GHG	212	R - S - M	152,4	60	83,6	38(39,5)	28(28,5)	60	100	9,5(10,0)	15	0.49

SK-2 Attachment

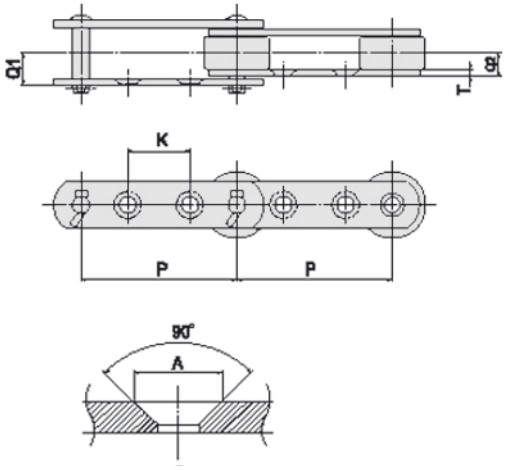


Chain No.		Roller Type	Pitch	Dimensions								add. Weight per Attachm. (kg)
			P	S1	S2	Q1	Q2	K	N	T	O	
GHG	03075 03100	R - S	75 100	33	49	15,5	11,5	30 40	55 65	3,2	10	0.10 0.12
GHG	430	R - S	101,6	37,6	51,6	22(22,5)	16(16,5)	40	70	4,8(5,0)	12	0.22
GHG	05100 05150	R - S R - S	100 150	33,4	50,7	21	15,5	40 60	65 85	4,5	10	0.16 0.20
GHG	450	R - S - M	101,6	47,6	60,7	27(28,5)	20(19,5)	40	70	6,3(6,0)	12	0.36
GHG	08150	R - S - M	150	46,1	58,7	27(26,5)	20(19,5)	60	90	6,3(6,0)	12	0.44
GHG	650	R - S - M	152,4	50	63	28,5(28)	21,5(21)	60	90	6,3(6,0)	12	0.44
GHG	10100 10150	R - S - M R - S - M	100 150	46,1	61	28,5(28)	21,5(21)	40 60	70 90	6,3(6,0) 6,3(6,0)	12	0.32 0.40
GHG	214	R - S - M	101,6	50	70	32,5	23,5	40	80	7,9	15	0.56
GHG	6205	R - S - M	152,4	55	75,7	35,5	26,5	60	100	7,9	15	0.74
GHG	12200 12250	R - S - M R - S - M	200 250	55	75,7	35,5	26,5	80 125	120 165	7,9	15	0.90 1.24
GHG	212	R - S - M	152,4	60	83,6	38(39,5)	28(28,5)	60	100	9,5(10,0)	15	0.98

Numbers in brackets of the Link Plate thickness indicates the Stainless Steel 300 Series.
The Number outside brackets is common for every series.

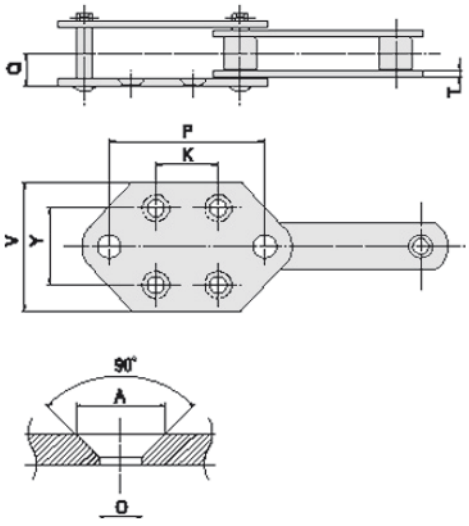
Double strand chains with attachments

G-2 Attachment



Chain No.		Roller Type	Pitch	Dimensions					
			P	K	T	Q1	Q2	A	O
GHG	03075 03075 03100	R - F - S R - S R - F - S	75 75 100	20 30 50	3,2	15,5	11,5	13,5	8
GHG	05100 05150	R - S R - F - S	100 150	40 60	4,5	21	15,5	15	10
GHG	08150	R - F - S - M	150	60	6,3	27	20	20	12
GHG	650	R - F - S - M	152,4	60	6,3(6,0)	28,5(28)	21,5(21)	20	12
GHG	10100 10150	S - M R - F - S - M	100 150	30 60	6,3(6,0)	28,5(28)	21,5(21)	20	12
GHG	6205	R - F - S - M	152,4	50	7,9	35,5	26,5	26	15
GHG	12200 12250	R - F - S - M R - F - S - M	200 250	80 125	7,9	35,5	26,5	26	15
GHG	17200 17250 17300	R - F - S - M	200 250 300	70 110 150	9,5(10,0)	45,5(46,5)	35(35,5)	26	15
GHG	26300 26450	R - F - S - M R - F - S - M	300 450	140 220	9,5(10,0)	48(49)	38(38,5)	26	15
GHG	36450 36600	R - F - S - M	450 600	220 300	12,7	60	46	32	19
GHG	52450 52600	R - F - S	450 600	200 300	16	71,5	45,5	38	24

G-4 Attachment



Chain No.		Roller Type	Pitch	Dimensions							add. Weight per Attachm. (kg/m) *
			P	V	K	Y	T	Q	A	O	
GHG	05100 05150	S S	100 150	80	50 70	50	4,5	21	15	10	4.6 4.1
GHG	650	S - M	152,4	110	75	70	6,3	28,5	20	12	7.2(7.6)
GHG	10150	S - M	150	110	75	70	6,3	28,5	20	12	7.27(7.4)
GHG	6205	S - M	152,4	110	75	70	7,9	35,5	26	15	11.0(11.3)
GHG	12200	S - M	200	110	100	70	7,9	35,5	26	15	10.2(11.3)
GHG	17200 17250	S - M	200 250	120 150	100 140	80 100	9,5	45,5	26	15	14.0(14.6) 14.5(15.0)
GHG	26200 26250 26300	S - M	200 250 300	120 150 150	100 140 180	80 100 100	9,5	48	26	15	17.5(18.5) 17.6(18.4) 16.7(17.4)
GHG	36250 36300	S - M	250 300	150	140 180	100	12,7	60	32	19	27.6(28.6) 26.2(27.1)

* = additional weight per attachment at every second link spacing

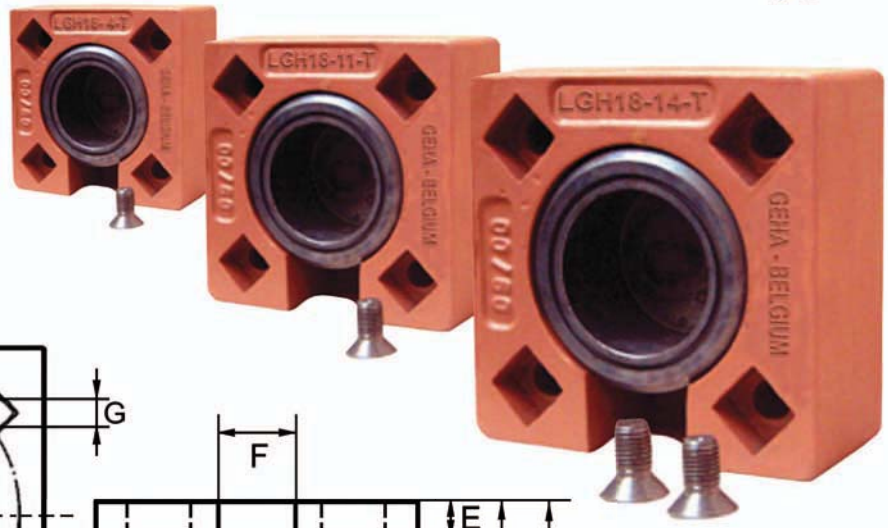
LGH bearings without maintenance

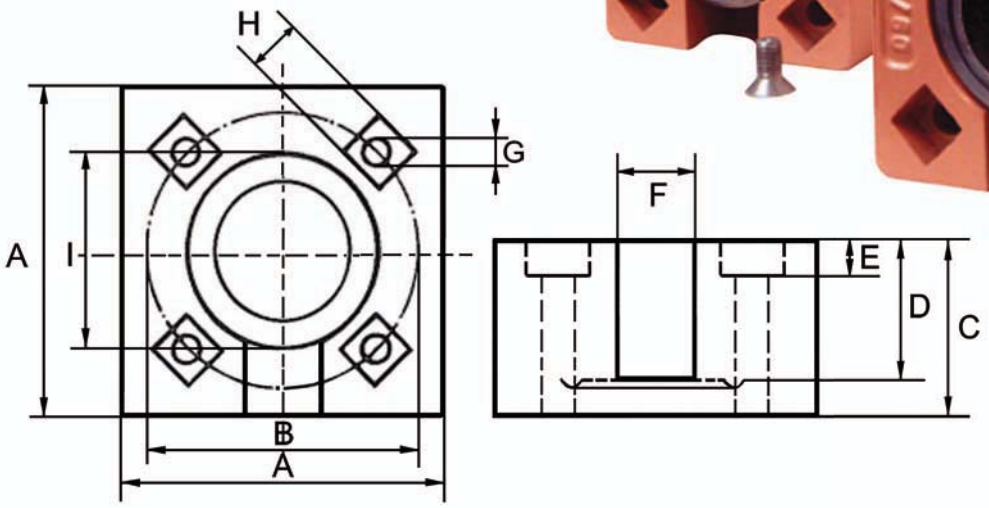
GEHA bearings without maintenance for bucketelevators

The GEHA gravity take-up makes it possible to have a footshaft construction with automatic take-up.
Due to this construction, the alignment of the footshaft is ensured and gives longer life on chains, sprockets and headshaft bearings.
The welded channel frame floats freely in vertical guide angles mounted inside the elevator casing.
The channel frame is provided with a built-in counter-weight to maintain proper tension.
Bearings consist of hardened tool steel sleeves secured on the shaft, rotating in hardened white iron bearing-blocks.
By this construction it is possible to make a completely sealed foot, so no shaft seals, no spill and no dust.
Due to the material-choice, the bearings resist very well in abrasive environment without greasing.

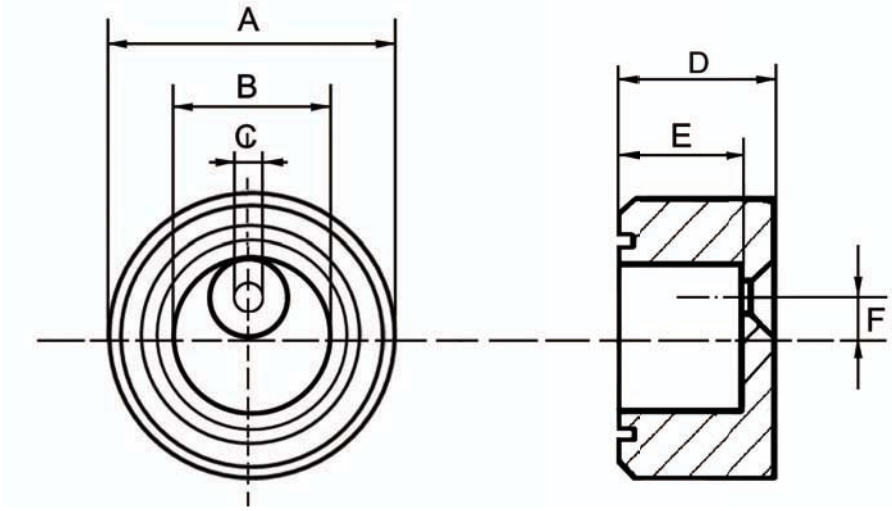
Other practical proven applications:
- Bearing for chain-conveyors which works under water in severe conditions.
- Endbearings of screwconveyors.
- Bearings for milltables and coolers.

Maintenance-free bearings for footshaft in bucket-elevators





Bearing - block										
	A	B	C	D	E	F	G	H	I	q/kg
LGH 18-4-T	178	165	82	65	18	52	17	30	112	12,5
LGH 18-11-T	230	203	108	90	20	55	21	34	138	26
LGH 18-14-T	305	280	200	160	20	65	30	50	195	80



Bearing bush							Bolts	Max. charge	Max. rotation speed	Weight
	A	B	C	D	E	F	G	H	I	q/kg
LGH 18-4-B	110,2	60	17	64	54	15	1 xM16	700	50-60	3,5
LGH 18-4-B	110,2	74,5	21	64	54	15	1 x1/4"			3
LGH 18-11-B	135,4	87,3	21	88,9	80	27	1 x3/4"	1200	50-60	6
LGH 18-11-B	135,4	100	21	88,9	80	27	1 x3/4"			5
LGH 18-14-B	190	130	25	160	140	40	2 x3/4"	4500	50-60	20

Installation & maintenance manual

1- Installation

Chain:
Put on clean floor the chain-strands to connect them with the connection pins / links.
Check the alignment of the head-shaft in accordance with the tension-shaft. Do not add extra weight on the tensioning device.
By crane the chain can be introduced in the casing from the head.
Do not torque the chain.
After this, the buckets can be installed by bolts and self-locking nuts and by torque-control tooling.
After 48 hours working check the torque on the bolts and nuts of the buckets.

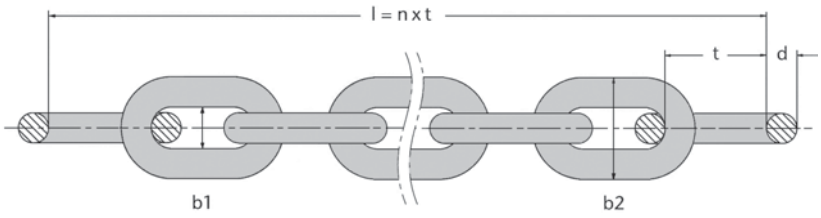
Sprocket-segments:
Please mount the several segments as they have all a reference number to respect.
Do not mix them! This is very important to avoid damage on the chain.
After 24/48 hours working please check the torque on the bolts/nuts of the segments.

2- Maintenance

General check of the chain, sprocket-segments and alignment twice a year.
Check also if the chain has no prolongation so that the buckets will not touch the bottom of the casing!
Clean the buckets several times if sticky product.
For long stop-periods, clean the chain and sprockets and oil them after cleaning.
After this let turn the chain 30 minutes.
If you have questions, please fax or E-mail to our engineers and always mention our reference number.

Components for bucket-elevators round link chain type

Dimensions and technical data for round link chains



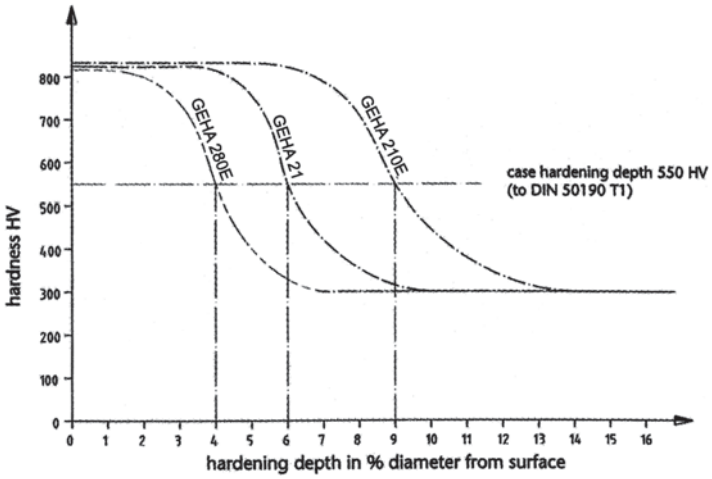
Dimensions for round link chains

Table 2: Dimensions and qualities

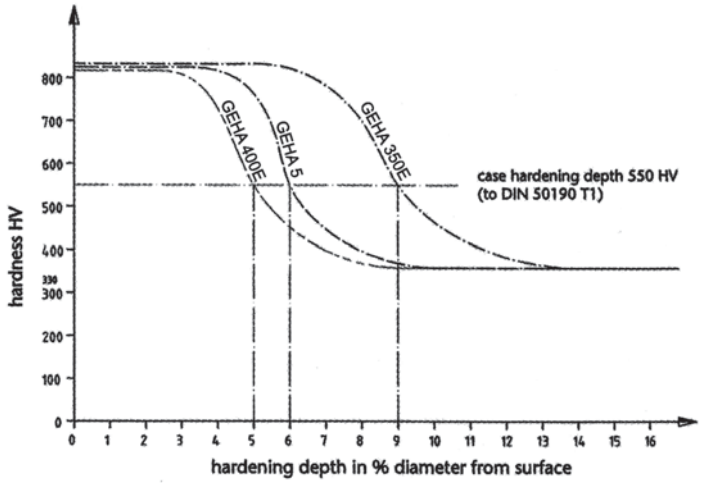
Dimensions: mm nominal dia. x pitch d x t (mm)	*DIN chain*	*weight kg/m*	*b1 inside width min. (mm)*	*b2 out-side width max. (mm)*	*case hardened qualities*					
					GEHA*280 E*	**GEHA***21*	**GEHA***210 E*	**GEHA***400 E*	**GEHA***S*	**GEHA***350 S*
					MBK	*MBK*	*MBK*	*MBK*	*MBK*	*MBK*
					kN	*kN*	*kN*	*kN*	*kN*	*kN*
10 x 28,0	766	2,3	12,0	36,0	44	39	33	63	58	55
10 x 35,0	764	2,0	14,0	36,0	44	39	33	63	58	55
13 x 45,0	764	3,5	18,0	47,0	74	66	56	106	98	93
14 x 50,0	WN	4,1	16,3	47,0	86	77	65	123	114	108
16 x 45,0	766	5,8	19,2	58,0	112	100	84	160	148	140
16 x 56,0	764	5,2	22,0	58,0	112	100	84	160	148	140
16 x 64,0	WN	5,1	20,0	55,0	112	100	84	160	148	140
18 x 50,0	766	7,4	21,6	65,0	142	127	107	204	188	178
18 x 63,0	764	6,5	24,0	65,0	142	127	107	204	188	178
19 x 75,0	WN	7,6	22,0	63,0	158	141	119	227	210	198
20 x 56,0	766	9,0	24,0	72,0	175	157	132	251	232	220
20 x 70,0	764	8,2	27,0	72,0	175	157	132	251	232	220
22 x 86,0	WN	9,8	26,0	74,0	212	190	160	304	281	266
23 x 64,0	766	12,0	27,6	83,0	232	207	174	332	307	290
23 x 80,0	764	11,0	31,0	83,0	232	207	174	332	307	290
26 x 73,0	766	15,0	31,2	94,0	298	265	223	425	392	371
26 x 91,0	764	14,0	35,0	94,0	298	265	223	425	392	371
26 x 100,0	WN	13,5	31,0	87,0	298	265	223	425	392	371
28 x 78,0	766	18,0	33,6	101,0	344	308	258	492	455	431
28 x 98,0	764	16,5	36,0	101,0	344	308	258	492	455	431
30 x 84,0	766	20,0	36,0	108,0	395	353	296	565	523	494
30 x 105,0	764	19,0	39,0	108,0	395	353	296	565	523	494
30 x 120,0	WN	17,8	36,0	102,0	395	353	296	565	523	494
33 x 92,0	766	25,0	43,0	119,0	478	427	359	684	633	598
33 x 115,0	764	22,5	43,0	119,0	478	427	359	684	633	598
34 x 136,0	WN	23,8	39,0	113,0	508	453	381	726	672	635
36 x 101,0	766	29,0	43,2	130,0	570	508	428	814	753	712
36 x 126,0	764	26,5	47,0	130,0	570	508	428	814	753	712
38 x 144,0	WN	30,0	44,0	127,0	635	567	476	907	839	794
39 x 109,0	766	34,0	51,0	140,0	669	597	502	956	884	836
39 x 136,0	764	31,0	51,0	140,0	669	597	502	956	884	836
42 x 118,0	766	40,0	50,0	151,0	776	692	582	1108	1025	970
42 x 147,0	764	36,0	55,0	151,0	776	692	582	1108	1025	970

MBK = min. breaking load, WN = works standard, d = diameter, t = pitch, other dimensions and qualities on request, including stainless steel and other alloys. Matching of chains and wheels is essential for trouble free operation.

Technical data for round link chains



Hardness curves for GEHA chains of special manganese chain steel



Hardness curves for GEHA chains of chromium-nickel and chromium-nickelmolybdenum alloy steel

Table 1: Technical data for GEHA qualities

	case hardened qualities manganese steel			*case hardened qualities CrNI / CrNiMo steel*		
	GEHA*280E*	**GEHA***21*	**GEHA***210E*	**GEHA***400E*	**GEHA***5*	**GEHA***350E*
proof stress N/mm2	140	125	105	240	150	210
breaking stress N/mm2	280 1)	250	210 1)	400 1)	370 6)	350 1)
contact surface hardness min. joint HV 30	800	800	800	800	800	800
case hardening depth ...d 0,01 d after etching	0,07	0,10	0,14 2)	0,09	0,10	0,14 2)
case hardening depth ...d	0,04	0,06 3)	0,09 4)	0,05	0,06 3)	0,09 4)
min. EHT 550						
product characteristics						
low abrasion	•			•		
medium abrasion		•		•	•	
strong abrasiveness			•			•
dynamic load						
light			•			•
medium		•			•	
heavy	•			•	•	

1) tolerance 10%
2) 30 mm Ø = 0,12 d 36-42 mm Ø = 0,11 d
3) ≥ 30 mm Ø = 0,05 d
4) 30 mm Ø = 0,08 d 36-42 mm Ø = 0,07 d
5) EHT = case hardening depth
6) ≥ 30 mm Ø = tolerance 20%

Example of a technical data sheet for determining the components of a bucket-elevator such as chain size & speed, filling degree, power consumption, ect...

Custumer / project Nr.			Alternative 1	Alternative 2
Required capacity	k	[t/h]	180	180
Product density	k	[t/m³]	1,7	1,7
Chain-speed	k	[m/s]	1,3	1,3
Distance between shafts	k	[m]	22	22
Bucket-capacity	a	[l]	23,5	23,5
Bucket-weight	a	[kg]	25,3	25,3
Bucket-projection	a	[mm]	280	280
Bucket wide	a	[mm]	630	630
Bucket-distance	c	[mm]	546	546
Chain diameter	a	[mm]	26	26
Chain pitch	a	[mm]	91	91
Number of links	a	[Stk]	5	5
Chain weight	a	[kg/m]	14	14
Shackle pitch	a	[m]	91	91
Shackle weight	a	[kg]	2,7	2,7
Number of chain-strands	a	[Stk]	2	2
Weight of tension sprocket	a	[kg]	260	260
Diam. head sprockets	a	[mm]	900	900
Diam. tension sprockets	a	[mm]	900	900
Dragging force (AS)	a	Tabel VDI 2324	60	60
Reduction-factor	a	Tabel VDI 2324	0,52	0,52
Breaking-load chain	a	[kN]	371	223
Chain quality	a		GEHA 350E	GEHA 210E
Product-loss at discharge	c		0,0060	0,0060

Product to convey	***k***		k	k
Temperature	***k***	***[°C]***	***50***	***50***
Humidity	***k***	***[%]***	***38***	***38***
Bucket size and Norm	***a***		***630 DIN 15234***	***630 DIN 15234***

Product flow	c	[m³/h]	105,88	105,88
Filling degree	c	[%]	52,57	52,57
Empty weight	c	[kg/m]	79,56	79,56
Density at filling degree	c	[kg/m]	38,46	38,46
Density at filling degree 100%	c	[kg/m]	73,17	73,17
Dynamic force	c	[N]	1402,47	1402,47
Dragging force	c	[N]	2028,00	2028,00
Slipping force	c	[N]	262,09	262,09

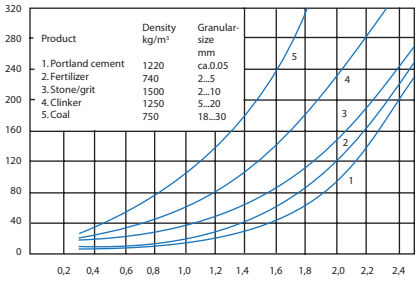
Static chain force at 100%	c	[kN]	40,45	40,45
Dynamic chain force at 100%	c	[kN]	41,85	41,85

Static chain force at filling degree	c	[kN]	32,86	32,86
Dynamic chain force at filling degree	c	[kN]	34,27	34,27

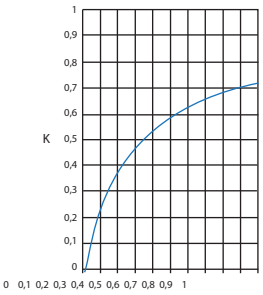
Required power at head-shaft	c	[kW]	20,98	20,98
Calculated number of buckets	c	[Stk]	85,76	85,76
Real number of buckets	a	[Stk]	86	86

Total developed length	c	[mm]	46956,00	46956,00
Center-distance shafts	c	mm	22,064	22,064
Dynamic safety factor at filling degree	*c*	[kN]	21,66	13,02

Dynamic safety factor at 100% filling degree	*c*	[kN]	17,73	10,66
Calculated chain working load based on VDI2324				



Specific dragging work as in function of the bucket-speed for different products to convey.

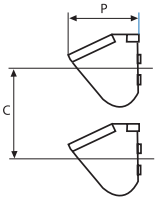


Reduction-factor K in function of relative side-view bucket continuous shape

The side-view of buckets is by closing distance

$$tf = 0{,}244 . \frac{c}{l.v}$$

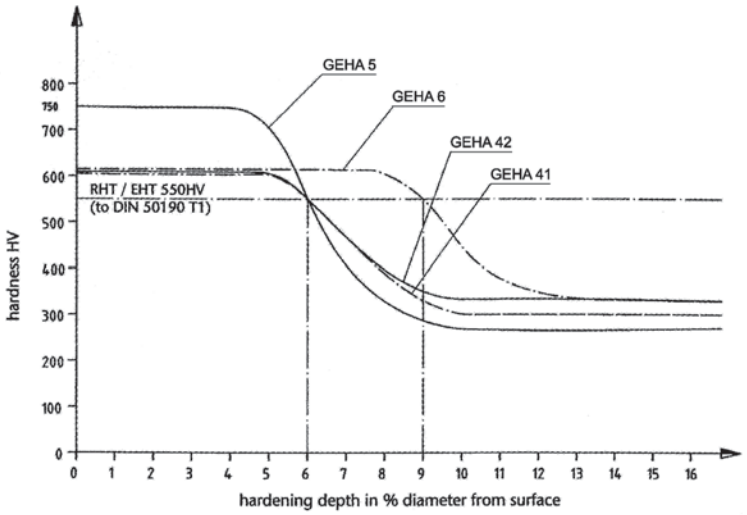
$$tf = 0{,}37$$



Bucket distance C and projection p

k= data from customer
a= acceptable values by Geha
c= calculated values

Technical data for bucket elevator attachments



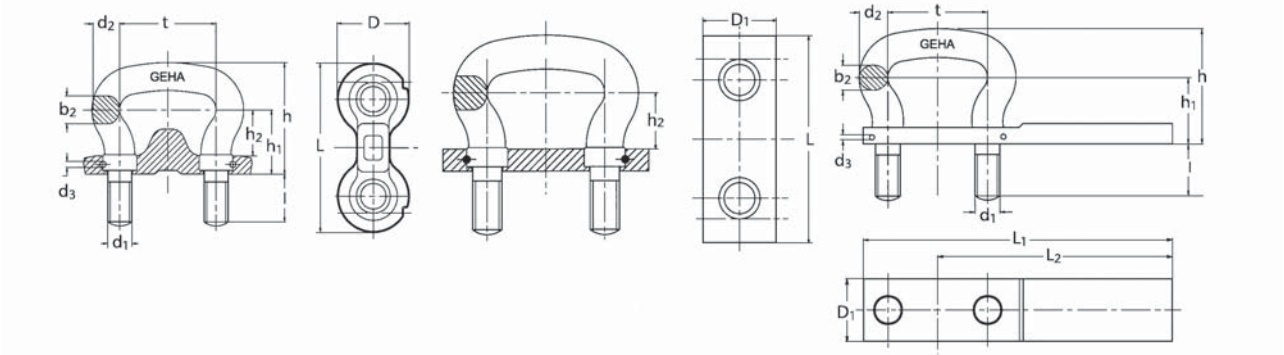
Hardness curves for bucket attachments

Technical data for GEHA qualities

	Hardened contact area qualities			*Case hardened qualities*
	Heat treatable steel	*CrMo-steel*	*CrMo-steel*	*CrNi-steel*
	GEHA 41	**GEHA 42**	**GEHA 6**	**GEHA 5**
proof stress N/mm2	125	240	240	150
breaking stress N/mm2	280	400	400	$370_{4)}$
contact surface hardness min. joint HV 1	600	600	600	750
hardening depth d min. after etching	$0,1_{1)}$	$0,1_{1)}$	$0,14_{1)}$	$0,1_{1)}$
hardening depth d min. $EHT_{2)}$ $RHT_{3)}$ 550 HV1	0,06	0,06	0,09	0,06

1) tolerance ...d 0,01 d
2) EHT = case hardened depth
3) RHT = effective hardening depth
4) tolerance - 10% ≥ t = 105 = -20%

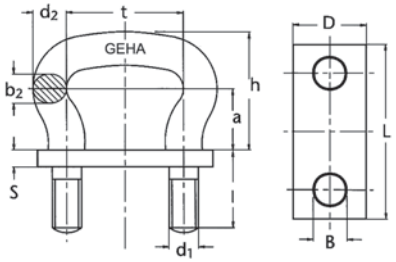
Chain shackles type TS / TS-N / TS-L



Shackle type TS **Shackle type TS-N** **Shackle type TS-L**

BUCKET CHAINS

Chain shackles - type - DIN 5699 and type - DIN 745



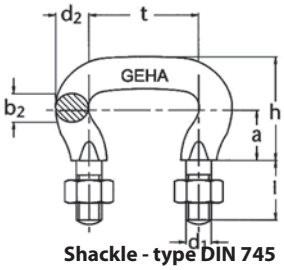
Shackle - type DIN 5699

- **Simple to fit**
- **For chain - DIN 764/766 and works standard**
- **Suitable for toothed wheels with equal chain pitch, otherwise use toothless wheels**
- **Shackles must only be used with distance plate and safety element to secure nut**

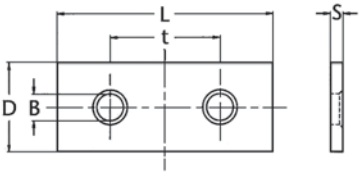
Table 5: Dimensions and qualities of GEHA shackles - DIN 5699

pitch t/mm	to suit chain, chain wheel toothed d/mm	chain wheel toothless d/mm-DIN		weight kg/each shackle with nuts	plate	chain shackles dimensions in mm										qualities induction hardened	
						b2	d2	d1	h	a	l	L	D	S	B	41 MBK (kN)	5
35	10 x 35	10-764	10-766	0,14	0,07	10	12	M 10	43	23	25	65	30	5	10,5	54	68
45	13 x 45	10/13-764	13-766	0,26	0,08	13	15	M 12	53	28	30	75	30	5	13	88	110
56	16 x 56	13/16-764	16-766	0,43	0,17	16	18	M 14	64	34	35	95	40	6	15	129	162
63	18 x 63	16/18-764	16/18-766	0,63	0,20	18	21	M 16	71	37	40	110	40	6	17	170	213
70	20 x 70	18/20-764	18/20-766	0,97	0,25	20	23	M 20	80	42	45	120	50	6	21	207	259
80	23 x 80	20/23-764	20/23-766	1,26	0,28	23	26	M 20	89	47	45	130	50	6	21	269	337
91	26 x 91	23/26-764	23/26-766	1,85	0,50	26	29	M 24	99	52	55	150	60	8	25	339	424
105	30 x 105	26/30-764	26/30-766	2,50	0,56	30	34	M 24	114	60	55	165	60	8	25	458	574
126	36 x 126	30/36-764	30/36-766	4,25	1,00	36	40	M 30	134	71	65	200	70	10	31	646	810
136	39 x 136	36/39-764	36/39-766	6,48	1,46	39	44	M 36	146	76	75	220	80	12	37	771	950
147	42 x 147	39/42-764	39/42-766	7,08	1,53	42	47	M 36	157	81	75	230	80	12	37	887	1110

MBK = min. breaking load, t = pitch, d = diameter, chain pitch and shackle pitch must be the same when using toothed chain wheels, regarding toothless wheels the shackle size may be bigger than the chain size.



Shackle - type DIN 745



Distance plate for shackle - type DIN 5699 and DIN 745

Table 6: Dimensions and qualities of GEHA shackles - DIN 745

pitch t/mm	to suit chain, chain wheel toothed d/mm	chain wheel toothless d/mm-DIN		weight kg/each shackle with nuts	plate	chain shackles dimensions in mm										qualities induction hardened	
						b2	d2	d1	h	a	l	L	D	S	B	41 MBK (kN)	5
45	13 x 45	10-764	10-766	0,19	0,08	11,5	14	M 10	40	20	25	75	30	5	10,5	76	98
56	16 x 56	10/13-764	13-766	0,39	0,17	15	18	M 12	50	25	32	95	40	6	13	115	149
63	18 x 63	16/18-764	16-766	0,67	0,20	18	21	M 16	60	30	40	110	40	6	17	145	188
70	20 x 70	18/20-764	18/20-766	1,03	0,25	20	23	M 20	68	34	45	120	50	6	21	179	232
80	23 x 80	20/23-764	20/23-766	1,26	0,28	23	26	M 20	74	37	45	130	50	6	21	237	307
91	26 x 91	23/26-764	23/26-766	2,03	0,50	26	29	M 24	86	43	55	150	60	8	25	303	393
105	30 x 105	26/30-764	26/30-766	2,60	0,56	30	34	M 24	100	50	55	165	60	8	25	403	523
126	36 x 126	30/36-764	30/36-766	4,42	0,50	36	40	M 30	118	59	70	200	70	10	31	580	753
147	42 x 147	36/39-764	36/39-766	6,07	1,10	42	46	M 30	136	68	70	220	70	10	31	790	1025
147	42 x 147	39/42-764	39/42-766	7,33	1,53	42	46	M 36	136	68	85	230	80	12	37	790	1025

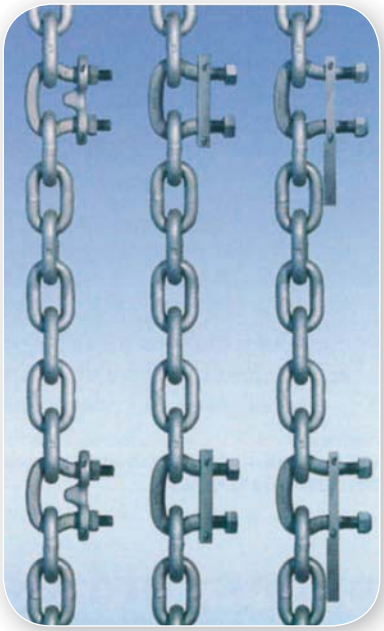
MBK = min. breaking load, t = pitch, d = diameter, chain pitch and shackle pitch must be the same when using toothed chain wheels, regarding toothless wheels the shackle size may be bigger than the chain size.

Endless chain system type TS, TS-N and TS-L

Table 4: Dimensions and qualities of shackles type TS, TS-N and TS-L

Pitch t/mm	to suit chain, nominal diameter d/mm	DIN	weight kg/each com-plete TS TS-N	plate TS-L	dimensions in mm											quality hardened (0,14 x d) 6 MBK (kN)
					b2	d2	d3	d1	h	h1	D	L	L1	L2	l	
45	13	764/766	0,53	0,86	14	14	5	M 12	64,5	40,5	37	75	150	112,5	26	106
56	16	762/764/766/WN	0,70	1,20	16	16	5	M 14	68	40	45	95	190	142,5	28	160
	16	762/764														
63	18	764/766	1,00	1,60	18	18	5	M 16	74	43	50	110	210	155	34	220
	18	764														
70	20	762/764/766	1,45	2,20	20	20	5	M 20	83	48	55	120	235	175	37	280
	20	764														
80	23	764/766/WN	1,85	3,10	23	23	5	M 20	92	53	60	130	265	170	37	360
	23	764														
91	26	764/766/WN	2,70	4,30	26	26	6	M 24	104	60	70	155	300	222,5	42	450
	26	764														
105	30	764/766/WN	3,90	6,20	30	30	6	M 24	118	68	80	165	345	262,5	42	630
	30	764														
126	34	WN	6,10	9,70	35	35	8	M30	139	81	85	200	415	315	66	860
	36	764/766														
	36	764														
136	39	764/766	7,60	11,60	39	38	8	M 36	152	88	90	220	450	340	79	955
	39	764/766														
147	44	764/766	9,00	13,60	40	40	8	M 36	162	93	95	230	480	365	79	1160

MBK = min. breaking load, t = pitch, d = diameter, chain pitch and shackle pitch must be the same when using toothed chain wheels. Toothless wheels may be used with un-matching chain and shackle pitch.



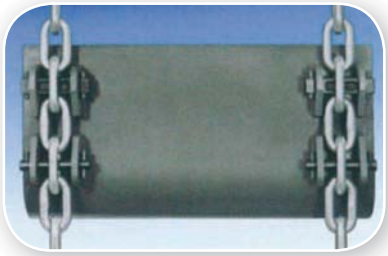
Endless chain systems with shackle type TS,-TS-N and TS-L

Advantages of endless GEHA chain strands:

- **Pre-assembled chain strands in lengths to suit client's requirements**
- **Minimised erection time as complete strands can be pulled into the elevator**
- **Easy dis-assembly / shortening as split pins can be removed quickly**
- **Chain locks are not required**
- **Full load can be applied to the strands without attaching buckets**

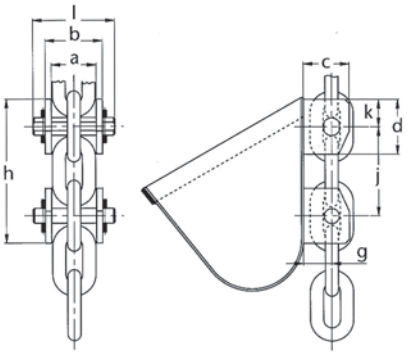
Quick and simple assembly of an endless chain strand

Plug-in bucket attachment type ST and chain locks type FL/RS and VK



Plug-in attachment for buckets

- **Variable bucket centres**
- **Improved bucket support compared to DIN-Shackle through larger support centres**
- **Endless chain strands with chain locks**
- **Suitable only with toothed wheels**
- **Requires chain locks and idling wheels with bucket guide discs**



Plug-in connector type ST

Dimensions for GEHA plug-in attachment type ST

nominal dia. x pitch, dxt/mm	dimensions in mm								
	a	*b*	*c*	*d*	*g*	*h*	*j*	*k*	*l*
14 x 50	49	65	55	65	30	150	100	25	93
16 x 64	58	78	65	80	40	190	128	32	110
19 x 75	68	90	75	95	40	230	150	40	130
22 x 86	75	105	85	110	45	260	172	45	160
26 x 100	92	122	100	120	50	290	200	45	170
30 x 120	108	138	125	140	60	340	240	50	190
34 x 136	120	150	130	155	65	380	272	55	210
38 x 144	135	171	145	170	70	400	288	58	240

t = pitch, d = diameter

Parts can be supplied pre-assembled or loose

The Plug-in attachment type ST consists of:

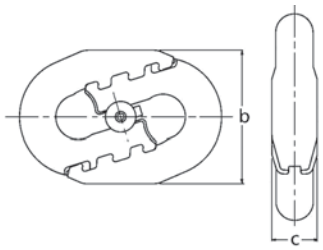
- 2x4 pieces side brackets with hardened holes
- 2 support pins – flat, inclusive split pin
- 2 support pins – round, inclusive split pin, case hardened

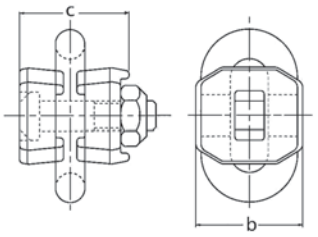
Fitting suggestions:

Line-up brackets so that the holes are in line and welded brackets to the buckets using a suitable electrode.

Chain locks type FL/RS and VK are used for connecting longer chain strands. These chain locks have the same physical properties to those of the corresponding chain.

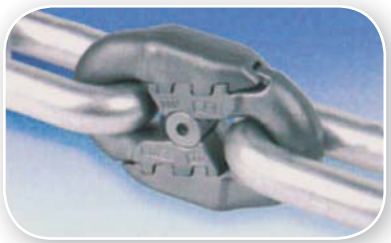
Assembly of 2 components is simple as the chain only needs to be slackened slightly. These chain locks should only be installed in vertical position.





Chain lock type FL/RS and VK

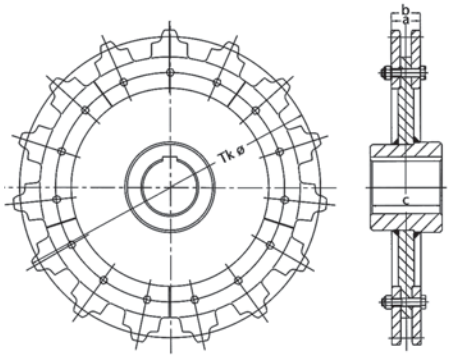
to suit chain, nominal dia. x pitch d x t/mm	dimensions in mm			
	height b	*width c*	*weight kg/each*	*type*
14 x 50	47	52	0,6	VK
16 x 64	56	18,5	0,5	RS
16 x 64	57	61	1,1	VK
19 x 75	66,5	23	0,8	RS
19 x 75	70	72	2,0	VK
22 x 86	77	26	1,9	FL
22 x 86	79	77	2,8	VK
26 x 100	89	29	2,4	FL
26 x 100	90	88,5	4,6	VK
30 x 120	107	36	3,2	FL
30 x 120	105	105	8,1	VK
34 x 136	117	40	4,2	FL
38 x 144	133	45	5,2	FL



Chain lock type FL

Chain lock type FL

Chain wheels with pocket teeth, in steel, with replaceable rim segments type GTA



GEHA Chain wheel type GTA, with replaceable pocket teeth, welded hub

- **Suitable as drive wheels**
- **Excellent service life due to hardened contact surfaces**
- **Suitable for vertical bucket attachments**

GEHA Drive wheels with pocket teeth type GTA are renown for their trouble free operating characteristics and long service life. The replaceable toothed rims are manufactured from alloy steel with teeth hardened (contact areas) to reduce wear.
These wheels can be used with vertical shackle and other types of attachments. Wheels are supplied with keyway or taper lock bushes, the latter on request. In addition the hubs have holes for spacer bars to adjust for the correct chain centre distance.
Toothed wheels are fitted to eliminate chain slip, usually caused when toothless wheels provide insufficient friction grip, i.e. short shaft centres.

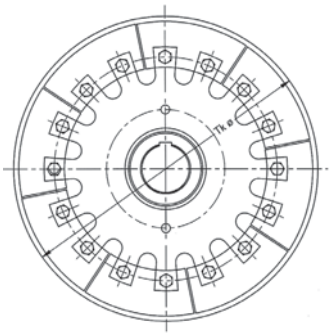
Dimensions for chain wheels type GTA

P.C.D. chain wheel mm, TK dia.	to suit chain, nominal dia. x pitch d x t/mm	DIN	number of teeth	dimensions in mm			weight kg/ each approx.
				a	b	c	
402	10 x 35	65	18	15	45	80	30
446		78	20	15	45	80	33
513		90	23	15	45	80	35
402	13 x 45	105	14	18	48	100	40
516		122	18	18	48	100	60
631		138	22	18	48	100	70
500	16 x 56	150	14	21	57	130	70
643		171	18	21	57	130	105
714			20	21	57	130	135
523	18 x 63	764	13	23	63	140	75
643			16	23	63	140	110
723			18	23	63	140	140
625	20 x 70	764	14	25	65	150	105
714			16	25	65	150	150
803			18	25	65	150	180
715	23 x 80	764	14	28	78	150	175
816			16	28	78	150	210
918			18	28	78	150	255
697	26 x 91	764	12	32	82	180	190
813			14	32	82	180	230
928			16	32	82	180	310
804	30 x 105	764	12	36	96	200	240
938			14	36	96	200	350
1071			16	36	96	200	420
965	36 x 126	764	12	42	112	220	380
1125			14	42	112	220	520
1285			16	42	112	220	690
1042	39 x 136	764	12	46	116	240	520
1215			14	46	116	240	630
1388			16	46	116	240	780
1126	42 x 147	764	12	50	130	250	620
1313			14	50	130	250	820
1406			15	50	130	250	950

P.C.D./Tk diam. = pitch circle diameter, d = diameter, t= pitch, other dimensions and executions on request.
Also available for chains as per DIN 766 and other standards. The chain pitch must be equal to the shackle pitch.

Toothless chain wheel with replaceable hard cast iron segments type SUR, type KS and type KSE.

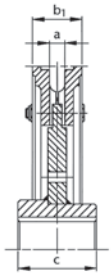
GEHA Chain wheel example for cast iron hub with segments type KS



a

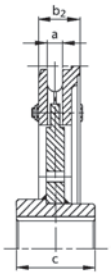
49a:
GEHA Chain wheel example for steel hub with segments type SUR without chain guide for vertically and horizontally mounted shackle.

- **Suitable for low loads and low abrasion**
- **Hubs made from cast iron also available with alloy steel segments**



b

GEHA Chain wheel example for steel hub with segments type KS with chain guide on both sides for vertically mounted shackle.



c

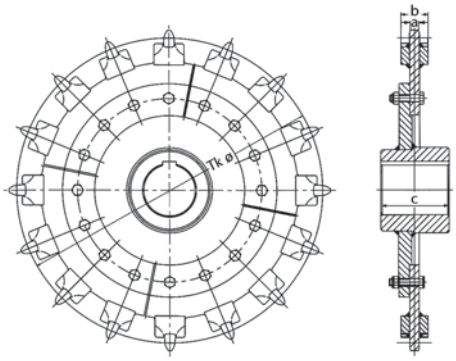
GEHA Chain wheel example for steel hub with segments type KSE with chain guide at one side for horizontally mounted shackle.

Dimensions for chain wheels with replaceable chilled cast iron segments type SUR, type KS and type KSE

P.C.D. chain wheel mm TK dia.	to suit chain d/mm	shackle pitch t/mm	dimensions in mm					number of segments each wheel	weight kg/each approx.		
			a	SUR b	KS b1	KSE b2	c		SUR	KS	KSE
400	13	45/56	18	47			100	12	29		
	16	56/63	22	66			100	12	38		
500	13	45/56	18	60	90	65	100	(12 SUR)8	51	60	55
	16	56/63	22	66	100	75	100	(12 SUR)8	53	60	55
	20	70/80	28	80	118	91	100	(12 SUR)8	57	65	60
630	16	80/91	22	66	120	75	160	12	103	130	120
	20	91/105	28	80	130	97	160	12	105	135	125
	23	56/63	30		140	110	160	12	140	130	
	26	70/80	32			125	160	12	135		
710	16	80/91	22		130	97	160	12	185	175	
	20	91/105	28	80	130	102	160	12	165	190	180
	23	105/126	30		140	110	160	12	190	180	
	26	56/63	34		164	125	160	12	210	190	
	30	70/80	36			130	160	12		195	
800	16	80/91	22		132		160	12	250		
	20	91/105	26			101	160	12		230	
	23	105/126	30	90	140	110	160	12	221	255	235
	26	56/63	34	100	160	130	160	12	228	260	245
	30	70/80	36			130	160	16		250	
900	16	80/91	20			75	190	16		300	
	20	91/105	26			102	190	16		310	
	23	105/126	30		145		190	16	335		
	26	70/80	34	100	170	129	190	16	293	345	320
	30	80/91	40	120	176		190	16	318	355	
1000	20	91/105	26			100	200	16		340	
	23	105/126	30		140	110	200	16	420	360	
	26	126/136	36		180	133	200	16	440	380	
	30	91/105	40	120	185	133	200	16	390	445	405
	36	105/126	46	135			200	16	420		
1250	26	126/136	32		185	138	220	16			625
	30	136/147	40	120	200	133	220	16	643	705	645
	36	126/136	46	135		161	220	16	658	735	670
1400	39	136/147	46	145			220	16	703		
	36	126/136	46	135			240	18	770		
	39/42	136/147	46	145			240	18	850		
1500	36	126/136	46	135			240	18	920		
	39/42	136/147	46	145			240	18	980		
1600	36	126/136	46	135			260	20	1080		
	39/42	136/147	46	145			260	20	1150		

P.C.D./Tk diam. = pitch circle diameter, d = diameter, t = pitch

Chain wheels with projecting teeth, in steel, with replaceable rim segments, type GIA



GEHA Chain wheel type GIA, with replaceable projecting teeth, welded hub.

Dimensions for chain wheels Type GIA with replaceable projecting teeth and welded hub.

P.C.D. chain wheel mm, TK Ø.	to suit chain, nominal dia. x pitch d x t/mm	DIN	number of teeth	dimensions in mm			weight kg/ each approx.
				a	b	c	
402	10 x 35	764	18	11	35	80	20
446			20	11	35	80	28
513			23	11	35	80	38
402	13 x 45	764	14	15	45	100	30
516			18	15	45	100	50
631			22	15	45	100	70
510	14 x 50	WN	16	15	45	100	60
637			20	15	45	100	100
500	16 x 56	764	14	18	54	130	60
643			18	18	54	130	85
714			20	18	54	130	110
612	16 x 64	WN	15	18	54	130	80
694			17	18	54	130	110
816			20	18	54	130	150
523	18 x 63	764	13	20	56	140	60
643			16	20	56	140	90
723			18	20	56	140	110
813	19 x 75	WN	17	20	60	140	210
908			19	20	60	140	290
625	20 x 70	764	14	23	63	150	80
714			16	23	63	150	115
803			18	23	63	150	150
823	22 x 86	WN	15	23	63	150	240
877			16	23	63	150	245
932			17	23	63	150	300
987			18	23	63	150	350
715	23 x 80	764	14	27	73	150	170
816			16	27	73	150	190
918			18	27	73	150	210
697	26 x 91	764	12	30	80	180	150
813			14	30	80	180	180
928			16	30	80	180	235
1020	26 x 100	WN	16	30	80	180	380
1084			17	30	80	180	410
1211			19	30	80	180	410

P.C.D./TkØ = pitch circle diameter, d = diameter, t = pitch, WN = works standard, other dimensions and executions on request. Also available for chains as per other standards. The chain pitch must be equal to the shackle pitch.

- **Suitable as drive wheels for medium duty applications**
- **Excellent service life due to hardened contact surfaces**
- **Suitable for horizontal bucket attachments**

Drive chain wheels type GIA, with projecting teeth, are self-cleaning and are ideal for use with sticky and compacting materials, as the teeth push out any product lodged within the chain links. Type GIA has been designed for light and medium duty. The replaceable toothed rims are manufactured from alloy steel with teeth hardened (contact areas) to reduce wear.
These wheels can be used with horizontal shackles and most other types of attachments. Wheels are supplied with keyway or taper lock bushes, the latter on request.
In addition the hubs have holes for spacer bars to adjust for the correct chain centre distance.
Toothed wheels are fitted to eliminate chain slip, usually caused when toothless wheels provide insufficient friction grip, i.e. short shaft centres.

Installation and maintenance manual

1. INSTALLATION

- put all the chains on the floor nearby the elevator and select the necessary strands and the connection-links.
- Before mounting the chain, check the correct allignment of the sprockets and shafts.
- After mounting the chain, the buckets have to be bolted on the chain. All bolts have to be checked and strongly fitted. (page D-29)
- After 1 or 2 weeks working at full charge, check by tork-key all the bolts of the buckets.
- By mounting the sprocket-segments on the hubs, check the corresponding stamped numbers on the segments. These numbers have to be respected carefully. Check also the tolerances on the H7/h7 dimensions as mentioned in the drawings.
- After 2 weeks working, check also the bolts and nuts torque of the sprocket-segments.

2. MAINTENANCE

- Check every year the prolongation of the chain which should be at the end no more than advised = ca 2,4mm on each pitch before replacement.
- Check once a year the torque of all the bolts (buckets and sprockets).
- Check once a year the allignment of the sprockets.
- Check also the teeth-shape of the sprocket-segments minimum every year.

FOR ALL YOUR ADDITIONAL QUESTIONS, PLEASE CONTACT OUR TECHNICIANS.

Recommended torque setting – bolts / nuts

For hexagon nuts to DIN 555 Grade 5

M10	30	Nm
M12	52	Nm
M14	83	Nm
M16	127	Nm
M20	245	Nm
M24	420	Nm
M30	847	Nm
M36	1480	Nm

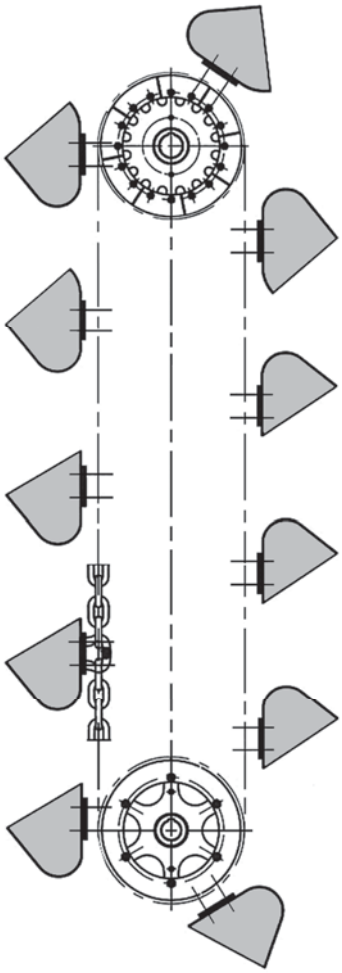
For hexagon nuts to DIN 934 Grade 8

M10	51	Nm
M12	89	Nm
M14	140	Nm
M16	213	Nm
M20	420	Nm
M24	725	Nm
M30	1451	Nm
M36	2531	Nm

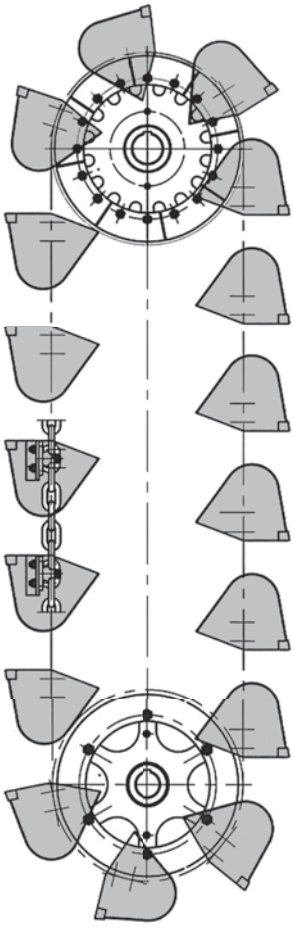
For self-locking steel nuts to DIN 980V Grade 8

M10	55	Nm
M12	95	Nm
M14	149	Nm
M16	225	Nm
M20	439	Nm
M24	752	Nm
M30	1487	Nm
M36	2575	Nm

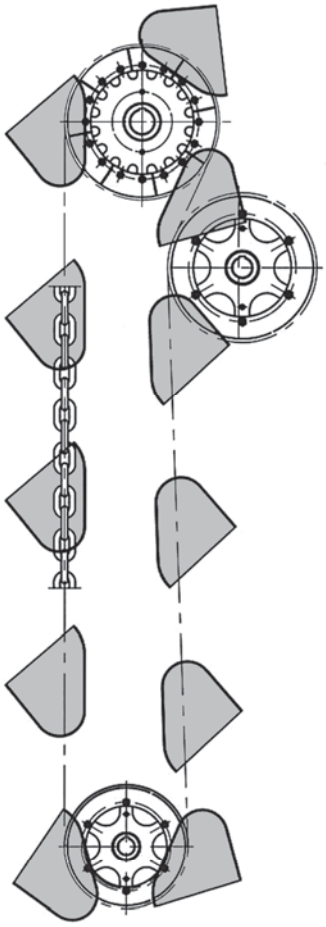
Scheme of chain bucket elevators



Bucket elevator, rear wall mounted, for centrifugal discharge type



Bucket elevator, side wall mounted, for gravity discharge type



Bucket elevator, side wall mounted, with snub wheel, positive discharge type

Bulk Densities	kg/m3
Ash,dry	550-650
Asphalt	700
Bauxite	1200-1400
Chrome ore	2000
Dolomite, crushed	1250-1600
Iron ore	2000-3000
Flyash, dry	500-720
Gypsum	900-1000
Gypsum, dry	850-1000
Glass	1300-1600
Granite	1250-1600
Limestone, hydrated	1200
Limestone, calcined	900
Limestone, crushed	1300-3000
Gravel and sand, wet	1600-1800
Coal	800
Phosphate	2000
Quartz	1600-1750
Sand, dry	1500-1600
Slag sand	900
Stones under 100 mm	1450-1600
Cement, clinker	1200-1300
Cement, raw meal	800-1000
Cement, dry	1350-1600
Sugar-beet	600

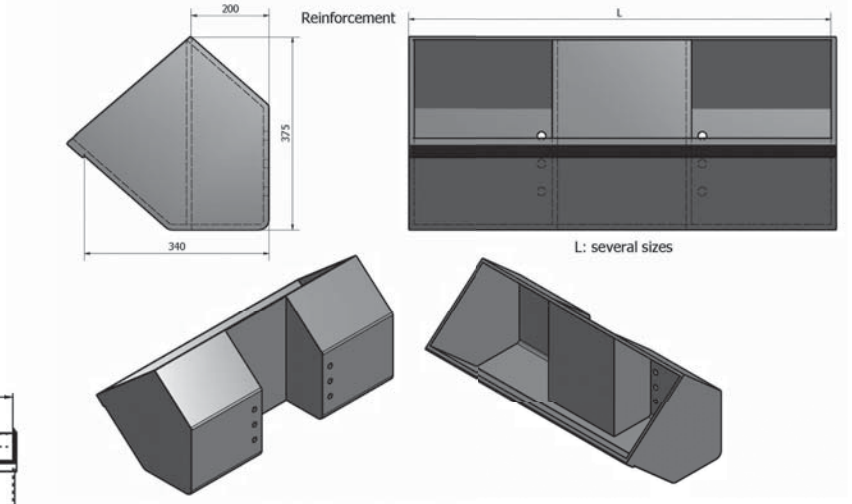
Technical details

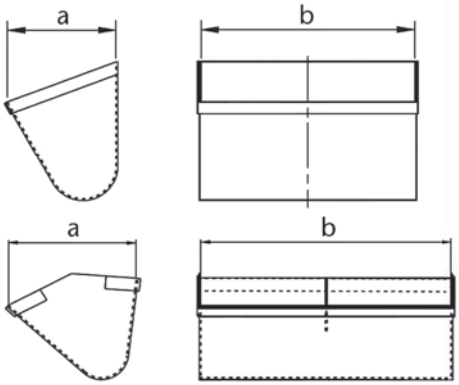
V = speed =	P.C.D. · π/60[m/s]
Hub max. =	P.C.D. - (b + 2 · dia.)[mm]
Length of hub NL =	Bore · 1,20 [mm]
Dia. of hub ca. =	Bore · 1,65 [mm]
P.C.D. =	t/s {s = sin (90/no. of teeth)} [mm]

Buckets

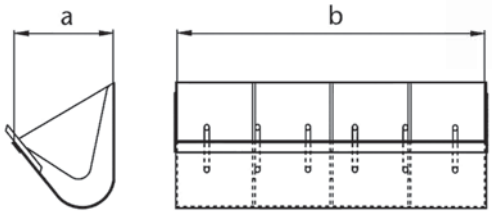
- **Elevator buckets to DIN and other dimensions**
- **Manufactured in a wide range of materials, including stainless steel, surface coating or rubber inserts**
- **Manufactured to standard or to special requirements**
- **Buckets widths from 800 mm inclusive of stiffeners**
- **Suitable for all types of bucket attachments**

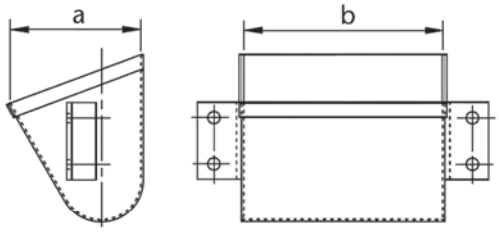
Buckets are supplied for rear wall mounting with re-enforcing strip (Type L) or re-enforcing plate (Type M) or for side wall mounting (Type N). Special requirements to suit customers can also be manufactured. The availability of high capacity buckets enables a considerable increase in throughput with minimal changes to the foot print of the elevator. When handling compacting material or large stones, the addition of ripping teeth to the front of approx. 5 to 10% of the buckets (Fig.40) is recommended. Such teeth reduce the scooping forces, minimise the risk of the tensioning device lifting and thus prevent chain slip. The information below provides details of the most popular range of buckets.



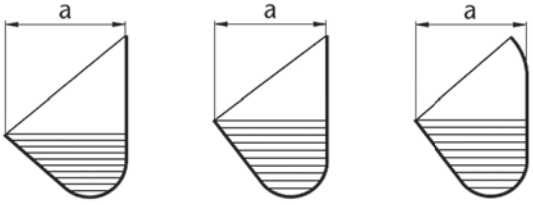


Above left: high capacity bucket
Above right: gravity, central discharge bucket

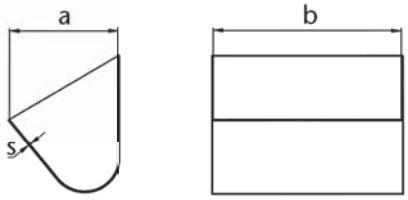




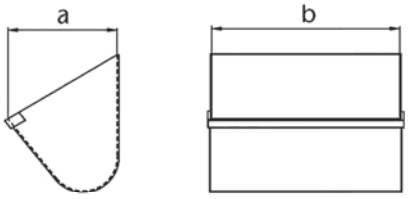
Top bucket with teeth and middle web
Bottom – bucket with side brackets



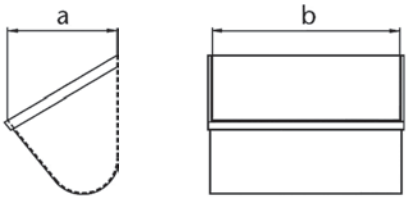
Elevator buckets to DIN 15233, 15234, 15235, (from left to right)



Bucket execution A – without Re-enforcing rim



Bucket execution B – with front Re-enforcing rim

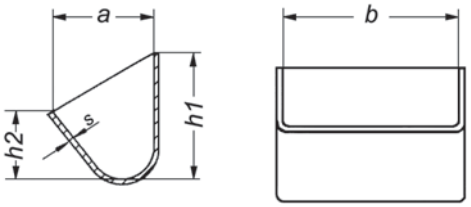


Bucket execution C – with Re-enforcing rim on three sides

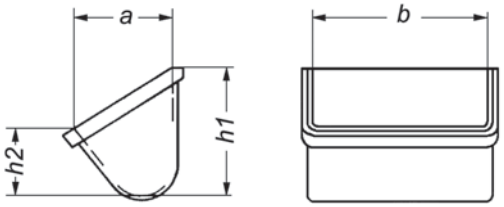
Elevator buckets

We supply elevator-buckets according to DIN and other in first class welded finish, and ask you to let us have your specified inquiries. Below you will find some informations of different pattern of elevator buckets.

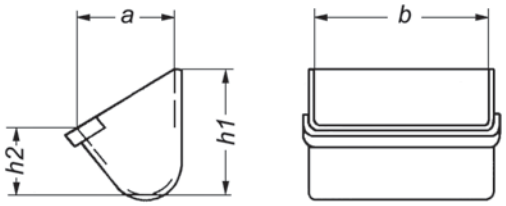
Finish A
without re-inforced edge



Finish C
with 3-sides re-inforced edges



Finish B
with re-inforced front edge

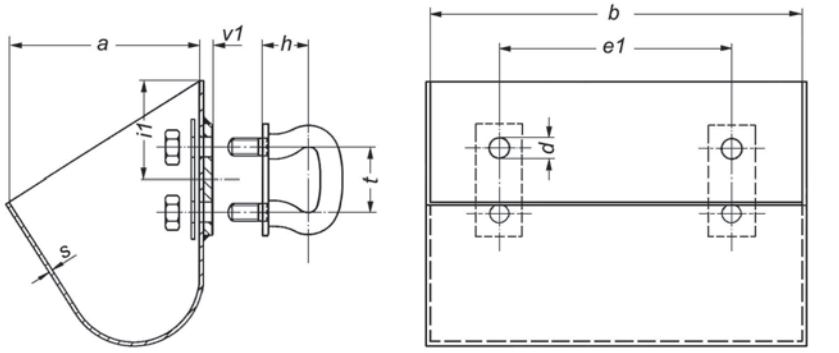


Elevator buckets	***DIN 15233***				***DIN 15234***				***DIN 15235***			
Dimensions b x a x s /mm	*h1 mm*	*h2 mm*	*ca. * kg*	*** l*	*h1 mm*	*h2 mm*	*ca. * kg*	*** l*	*h1 mm*	*h2 mm*	*ca.* kg*	*** l*
160 x 160 x 3	180	71	2.17	1.20	200	106	2.39	1.90	224	106	2.56	1.90
200 x 160 x 3	180	71	2.57	1.50	200	106	2.80	2.40	224	106	3.07	2.40
250 x 200 x 4	224	90	5.26	3.00	250	132	5.82	4.60	280	132	6.16	4.60
315 x 200 x 4	224	90	6.08	3.75	250	132	6.82	5.80	280	132	7.41	5.80
400 x 224 x 4	250	100	8.15	5.90	280	150	9.40	9.40	315	150	10.4	9.40
500 x 250 x 5	280	112	14.40	9.30	315	170	16.10	14.90	355	170	17.7	14.90
630 x 280 x 5	315	125	20.20	14.60	355	190	22.10	23.50	400	190	24.1	23.50
800 x 315 x 6	355	140	33.30	23.30	400	212	36.90	37.30	450	212	39.3	37.30
1000 x 315 x 6	400	160	46.00	37.60	450	236	50.30	58.30	500	236	53.5	58.30
1250 x 400 x 6	450	180	63.70	59.40	500	265	68.50	92.00	560	265	73.2	92.00
Special sizes												
1400 x 425 x 8					545	282	112.00	117.00				
1600 x 450 x 8					575	300	130.00	150.00				

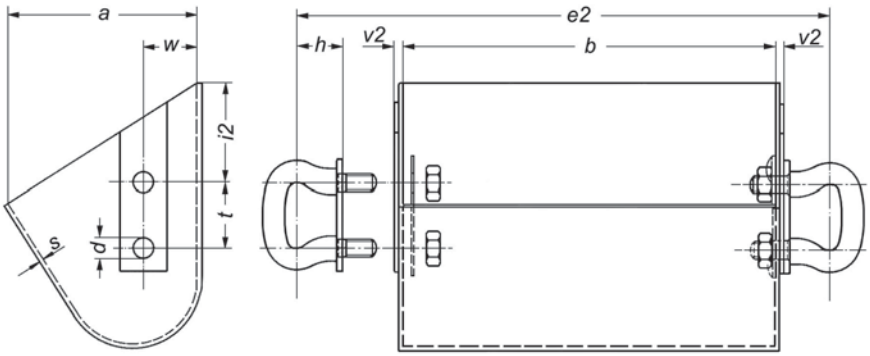
* Weight per piece for finish A approx. kgs.
** litre content of bucket

DIN 5699 - Fastening of buckets by means of chain shackles including distance plate

Buckets for back-wall-fastening, drilled according to DIN 15236



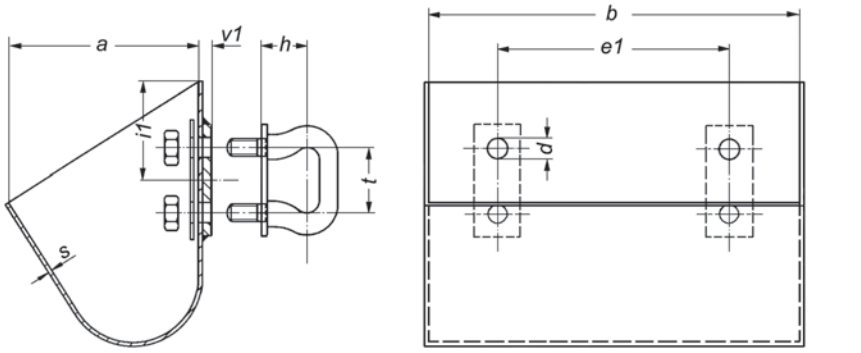
Buckets for side-fastening, drilled according to DIN 15236



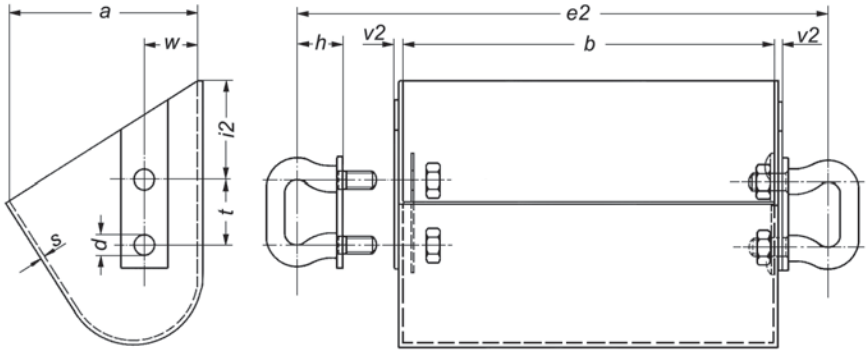
DIN 15234 Elevator buckets *Dimensions b x a x s /mm*	*Chain shackle*			*Back-wall-fastening*			*Side-fastening*			
	t/mm	*d/mm*	*h/mm*	*e1/mm*	*i1/mm*	*v1/mm max*	*e2/mm*	*i2/mm*	*v2/mm*	*w/mm*
160 x 140 x 3	35	10.5	28	100	67	7	230	67	7	36
160 x 160 x 3	45 56	13 15	33 40	100	75	9 12	240 254	75	7	40
200 x 160 x 3	45 56	13 15	33 40	125	75	9 12	280 294	75	7	40
250 x 200 x 4	56 63	15 17	40 43	160	95	12 13	344 350	95	7	50
315 x 200 x 4	63 70	17 21	43 48	200	95	13 14	418 428	95	8.5	50
400 x 224 x 4	70 80	21	48 53	250	106	14	513 523	106	8.5	56
500 x 250 x 5	80 91	21 25	53 60	315	118	14 17	626 640	118	10	63
630 x 280 x 5	91 105	25	60 68	400	132	17	770 786	132	10	70
800 x 315 x 6	105 126	25 31	68 81	500	150	17	960 986	150	12	80
1000 x 355 x 6	126 136	31 37	81 88	630	170	17 20	1186 1200	170	12	90
1250 x 400 x 6	136 147	37	88 93	800	190	20	1454 1464	190	14	100
1400 x 425 x 8	147	37	80	900	230	20	1614	230	14	115
1600 x 450 x 8	147	37	80	1000	250	20	1814	250	14	125

DIN 745 - Fastening of buckets by means of chain shackles (replaced by DIN 5699)

Buckets for back-wall-fastening, drilled according to DIN 15236

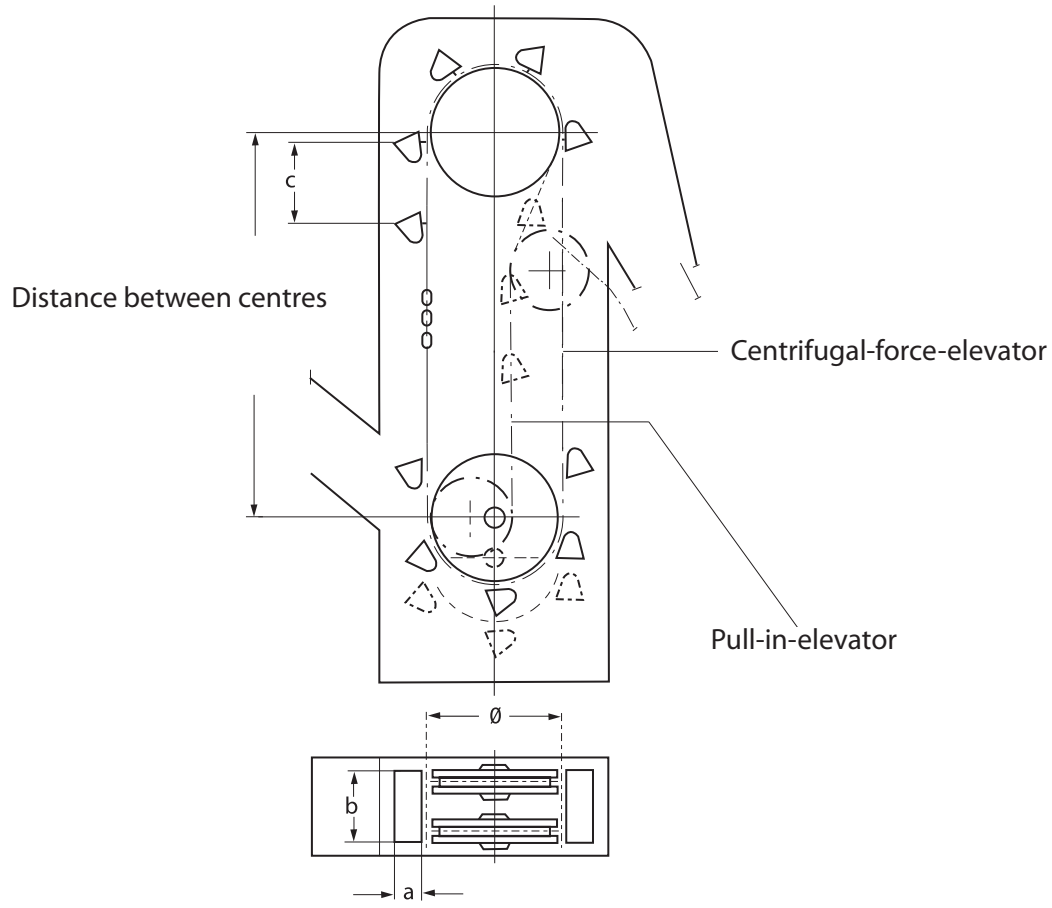


Buckets for side-fastening, drilled according to DIN 15236



DIN 15234 Elevator buckets *Dimensions b x a x s /mm*	*Chain shackle*			*Back-wall-fastening*			*Side-fastening*			
	t/mm	*d/mm*	*h/mm*	*e1/mm*	*i1/mm*	*v1/mm max.*	*e2/mm*	*i2/mm*	*v2/mm*	*w/mm*
160 x 160 x 3	45 56	10.5 13	25 31	100	75	7 10	224 236	75	7	40
200 x 160 x 3	45 56	10.5 13	25 31	125	75	7 10	264 276	75	7	40
250 x 200 x 4	56 63	13 17	31 36	160	95	10 13	326 336	95	7	50
315 x 200 x 4	63 70	17 21	36 40	200	95	13 14	404 412	95	8.5	50
400 x 224 x 4	70 80	21	40 43	250	106	14	497 503	106	8.5	56
500 x 250 x 5	80 91	21 25	43 51	315	118	14 17	606 622	118	10	63
630 x 280 x 5	91 105	25	51 58	400	132	17	752 766	132	10	70
800 x 315 x 6	105 126	25 31	58 69	500	150	17	940 962	150	12	80
1000 x 355 x 6	126 147	31	69 78	630	170	20	1162 1184	170	12	90
1250 x 400 x 6	147	37	80	800	190	20	1438	190	14	100
1400 x 425 x 8	147	37	80	900	230	20	1588	230	14	115
1600 x 450 x 8	147	37	80	1000	250	20	1788	250	14	125

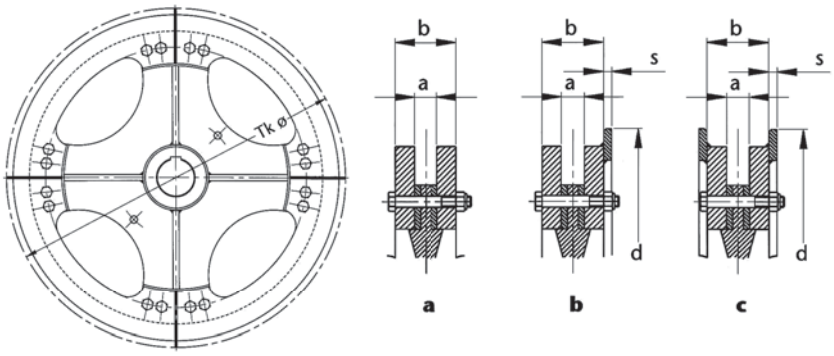
Scheme of round-link-bucket-elevators



Elevator buckets *Dimensions b x a /mm*	*Pitch line-Ø*	*Associated chain with measurements as per DIN 764 Nominal diameter x pitch*	*No. of links*	*Associated chain shackle as per DIN 5699 Pitch for chain wheels*		*Distance of buckets with chain wheels* C C	
				toothed	***non toothed***	***toothed***	***non toothed***
	mm	*mm*	*	*mm*	*mm*	*mm*	*mm*
160 x 160	500	10 x 35	9	35	45	350	360
200 x 160	500	13 x 45	9	45	56	450	461
250 x 200	630	16 x 56	9	56	63	560	567
315 x 200	630	18 x 63	9	63	70	630	637
400 x 224	710	20 x 70	7	70	80	560	570
500 x 250	800	23 x 80	7	80	91	640	651
630 x 280	900	26 x 91	7	91	105	728	742
800 x 315	1000	30 x 105	7	105	126	840	861
1000 x 355	1250	36 x 126	7	126	136	1008	1018
1250 x 400	1250/1400	39 x 136	7	136	147	1088	1099
1400 x 425	1400/1500	42 x 147	7	147	147	1176	1176
1600 x 450	1500	42 x 147	7	147	147	1176	1176

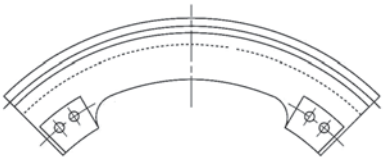
* For less or more capacity, chain ends with other number of links may be used.
ATTENTION ! When planning an elevator the load of the single-strand shall not be higher than 1/10 of the chain breaking force. (safety-factor 1 : 10)

Toothless chain wheels with replaceable steel rim segments type RUP



- **Suitable as drive and idling wheel**
- **Suitable for vertical and horizontal shackle attachment**
- **Supplied with segments in 90° (quarters) or 180° (halves) execution**
- **Suitable for heavy load applications**
- **90° segment can be exchanged with chain resting on the wheel**

Chain wheel type RUP with replaceable steel rim segments



Replaceable 90° segment (quarter) for chain wheel type RUP

a) Chain wheel type RUP, toothless with replaceable steel rim segments

b) Chain wheel type RUP 1, toothless with replaceable steel rim segments and chain guide at one side

c) Chain wheel type RUP II, toothless with replaceable steel rim segments and chain guide at both sides

Chain wheels Type RUP are supplied primarily with 90° segment to ease replacement, but 180° segments may be supplied on request. Instead of cast iron, we manufacture the segments from CrMo alloy steel, which substantially increases the service life. Segments are normally supplied with a tensile strength of 700 to 800 N/mm², but this can be increased, on request, by heat treatment up to 1000-1400 N/mm². Such treatment ensures good durability under extreme operating conditions. These chain wheels can be used with vertically and horizontally mounted shackles and many other types of bucket attachments. The steel segments can also be retrofitted to cast iron or cast steel hubs. The cut-outs in the hub minimise the chance of material build-up within the wheel, which could otherwise lead to chains coming off the wheels.
All wheels are supplied with keyways or, on request, with taper lock bushes.
In addition the hubs have holes for spacer bars to adjust for the correct chain centre distance. Segment scan be supplied, on request, with chain guide at one or both sides. However, experience has shown that such chain guides only required for return wheels.

Dimensions for chain wheels type RUP, type I, type RUP II

P.C.D. chain wheel mm, TK Ø.	to suit chain, nominal diameter d/mm	shackle t/mm	bucket width	dimensions in mm a	b	c	d	s	number of segments each wheel 90° Seg.	weight without chain guide kg/ each
500	16	63	160			150		12	8	50
			200						8	55
630	18	70	250	23	57	150		12	8	85
			315	23					8	90
710	20	80	400	33	74		734	12	8	115
820	23	91	500	38	90		845	15	8	175
930	26	105	630	44	96	180	960	15	8	290
1000	30	126	800			200		15	8	350
1130	30	126	1000	48	120	200	1164	15	8	410
1250	36	147	1250	62	150	250	1290	15	8	540
1340	36	147	1400				1385	15	8	760

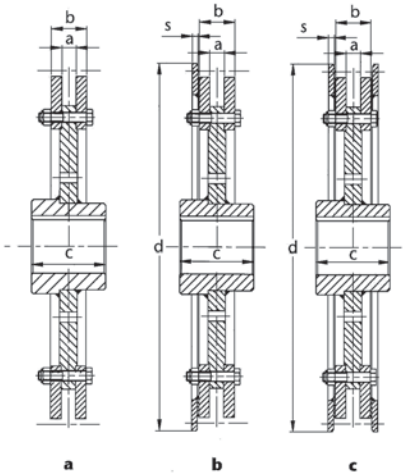
P.C.D./TkØ = pitch circle diameter, d = diameter, t = pitch, other dimensions and executions on request.

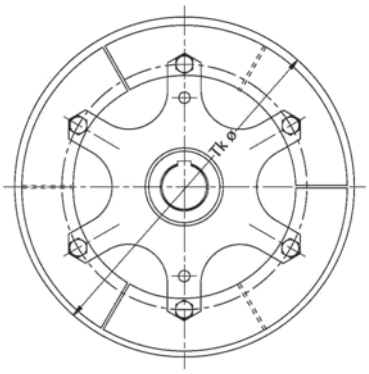
Toothless chain wheels with replaceable steel rim segments type RUU

a:
Chain wheel type RUU, toothless with replaceable steel segments

b:
Chain wheel type RUU 1, toothless with replaceable steel segments and chain guide at one side

c:
Chain wheel type RUU 1, toothless with replaceable steel segments and chain guide at both sides





- **Suitable as return and drive wheel, drive wheel for medium load capability**
- **Extra large cut-outs to prevent build-up inside the wheel, ideal for return idling wheels**
- **Suitable for vertical and horizontal bucket attachments**

Chain wheels type RUU may be used as return idling wheels as well as drive wheels for medium load and up to 30m shaft centres. The large cut-outs in the hub are designed to prevent build-up of product inside the wheels and are therefore ideal for return idling wheels inside the elevator boot. Even material with larger particle size is pressed through the large cut-outs, otherwise this could lead to chains coming off the wheels. Hubs are manufactured from carbon steel and segments are fabricated from CrMo alloy steel. Segments are normally supplied with a tensile strength of 700 to 800 N/mm², but this can be increased, on request, by heat treatment. These chain wheels can be used with vertically and horizontally mounted shackle and many other types of bucket attachments. All wheels are supplied with keyways or, on request, with taper lock bushes. In addition the hubs have holes for spacer bars to adjust for the correct chain centre distance. Segments can be supplied, on request, with chain guide at one or both sides. However, experience has shown that such discs are unnecessary for drive wheels.

Dimensions for toothless chain wheels with replaceable steel segments type RUU

P.C.D. chain wheel mm, TK Ø.	*to suit chain, nominal diameter d/mm*	*shackle pitch t/mm*	*dimensions in mm*					*number of segments each wheel*	*weight without chain guide kg/each*
			a	*b*	*c*	*d*	*s*		
400	10	35/45	15	35	80	420	12	6	30
	13	45/56	18	48	80	420	12	6	30
500	13	45/56	18	48	100	525	12	6	45
	16	56/63	21	51	100	525	12	6	45
630	16	56/63	21	51	160	650	12	6	80
	18	63/70	23	59	160	650	12	6	85
	20	70/80	25	65	160	650	12	6	85
710	20	70/80	25	65	160	750	12	6	115
800	23	80/91	28	68	160	850	15	6	155
	26	91/105	32	78	160	850	15	6	220
900	26	91/105	32	78	190	950	15	8	260
1000	30	105/126	36	96	200	1050	15	8	340
1250	30	105/126	36	96	220	1300	15	8	530
	36	126/136	42	112	220	1300	15	8	530
1400	39	136/147	45	125	240	1450	15	8	805
	42	147	48	128	260	1450	15	8	840
1500	42	147	48	128	260	1550	15	8	960

P.C.D./TkØ = pitch circle diameter, d = diameter, t = pitch, other dimensions and executions on request.

Example of bucket elevator sizing

Table 30: Bucket elevator calculation

Customer:
Bucket elevator data:

Customer's ref.:

Automatic calculation:

C A	required handling rate	Q V	[t/h] [m3/h]	350 259
C C	required shaft centres product	A	[m]	35 cement
C	bulk density	lv	[kg/m3]	1350
C	moisture		[%]	10%
C	temperature	T	[°C]	100°
S	bucket material			St. 37
A	max. handling rate bulk density	QT	[t/h]	585
A	est. power absorbed	VT	[m3/h]	433
A	at req. handling rate		[kw]	54,56
A	est. power absorbed at max. handling rate			91,13
S	req. motor power	Pa	[kw]	
A	drive wheel speed		[rpm]	19,87
S	chain speed	v	[m/s]	1,3
A	bucket filling degree at req. handling rate	p	[%]	59,86
A	bucket distance	aB	[mm]	630
Chain wheels				
S	drive wheel P.C.D.:	TkØ	[mm]	1250
S	return wheel P.C.D.:	TkØ	[mm]	1250
S	weight return wheel	RG	[kg/pc.]	630
S	chain wheel type drive			type RUA
S	chain wheel type return			type RUUI
Buckets				
A	calculated no. of buckets	nB		117,3
S	actual no. of buckets	nBe		118
S	bucket size	B	[mm]	1000x355x6
S	DIN/type/drawing			DIN 15234
S	bucket content	Bi	[litre]	58,3
S	bucket weight	Bg	[kg]	53
Chain size and attachments				
S	chain wire size			30
S	chain pitch	t	[mm]	105
S	no. of links	n	[mm]	5
S	Chain type/DIN			DIN 764
S	chain quality			400E
S	min. breaking load	MBL	[kN]	565
S	attachment size/pitch	Bt	[mm]	105
S	weight total chain strand	KG	[kg/m]	22,5
A	effective strand length	Le	[m]	74,34
A	calculated strand length	L	[m]	73,925
A	calculated shaft centres	AT		35,21
A	max. chain load at req. handling rate	P	[kN]	49,54
A	max. chain load at 100% full buckets		[kN]	58,68
A	**safety factor** at req. handling rate			11,18
A	safety factor at 100% full buckets			9,63
	total dead weight on return wheels		[kg]	2520

C= customers information, S= recommendation,
A= automatic calculation

used formula for calculation

$$V = \frac{Q}{lv} = \frac{350}{1,35} = 259 \text{ m3/h}$$

$$QT = \frac{3600 \cdot lv \cdot Bi \cdot v}{aB} = \frac{3600 \cdot 1,35 \cdot 58,3 \cdot 1,3}{630} = 585 \text{ t/h}$$

$$VT = \frac{QT}{lv} = \frac{585}{1,35} = 433 \text{ m3/Std.}$$

$$P = \frac{Q \cdot aB \cdot 100}{3600 \cdot Bi \cdot lv \cdot v} = \frac{350 \cdot 630 \cdot 100}{3600 \cdot 58,3 \cdot 1,35 \cdot 1,3} = 59,86\%$$

$aB = n \cdot t + Bt = 5 \cdot 105 + 105 = 630$ mm

$nB = L/aB = 73,925/0,63 = 117,3$

$Le = nBe \cdot aB = 118 \cdot 0,63 = 74,34$ m

$L = 2 \cdot A + (TkØ \cdot Pi) = 2 \cdot 35 + (1,25 \cdot 3,1415) = 73,925$m

$$AT = \frac{Le - (TkØ \cdot Pi)}{2} = \frac{74,34 - (1,25 \cdot 3,1415)}{2} = 35,21 \text{ m}$$

effective lengths of chain strand · weight of chain strand + effective no. of buckets · (bucket weight + bucket contents · bulk density · bucket filling degree/2 + 4 · weight return wheel = total load 2 strands (kg)
load 1 strand (F) = total load 2 strands / 2 (kg)

$$S = \frac{MBK \cdot 100}{F} = \frac{565 \cdot 100}{5049,65} = 11,18$$

The safety factor must be min. 8 for bucket elevators. At a safety factor of more than 15 it may be more economic to use a different chain quality or size.

General technical information

Chain Assembly:

We supply chain ends with 5,7,9 or more links, long chain strands and endless chain strands pre-assembled with TS-shackles.

Chain ends:

Chain ends are always supplied as matched pairs. Bundles are tied together with coloured wire, colour depending on chain quality as follows:

GEHA 280E – white
GEHA 21 – yellow
GEHA 210E – black
GEHA 400E – green
GEHA 5 – red
GEHA 350E – blue

Wire should only be removed directly before commencing assembly and chain ends of each pair must be assembled next to each other to avoid chain misalignment. Chains should be assembled with the welds pointing towards the shaft centre.

TS-shackle:

Long chains strands, max. length up to 400kg per length.
Long chain strands and endless chain strands will be supplied in matched pairs to avoid misalignment. One end of each strand is colour coded.
Coloured links of each strand must be assembled next to each other, colours will be advised in the delivery note.

General

Chain ends fitted whith DIN or similar D-shackles require the buckets to be fitted before lifting into the housing to minimise the risk of hairline cracks forming in the shackle. Chain assemblies with the TS-shackle system, or long chain strands may be lifted into housing and fitted without buckets without incurring the risk of cracks, the latter may be fitted after the chains have been made endless. Pre-assembly of internal components substantially reduces downtime for rechaining.
Accurate alignment of drive and idling wheels, parallel drive and idling shafts and correct chain centres are essential for trouble-free operation. Chain tension should be adequate to ensure free, low noise chain movement. Noise, which may arise from the rubbing together of two steel surfaces and resonant frequencies are often caused by excess chain tension. Proper chain tension must be assured at all times by employing an efficient, preferably, self-tensioning device.

Shortening of chain

Should it be necessary to shorten the chain, only a complete pair of chain ends, with equal number of links, should be removed. Removing links from long chain strands may be carried out by cold cutting, using a cutting disc. As individual chain links may have different tolerances, some misalignment should be expected when removing individual links. Heating the chain or welding should be avoided. We will be pleased to advise.

Maintenance / Wear measurement:

All conveyor parts which may be subject to wear (wheels, chains, bucket attachments, chain locks) should be checked regularly for wear or damage. Chain contact surfaces are subject to normal wear, the extent of which depends on chain quality, number of link movements, contact load and material handled. Wear in the contact areas reduces the chain thickness and thus has a direct relationship to service life. Lubrication, for example with oil, or increased moisture content in the product increases wear, especially with abrasive materials. Wheel scrapers and other devices that clean the wheel grooves reduce wear. Chains, wheels and bucket attachments should be checked thoroughly following an overload condition. Chains and chain wheels, or wheel rims, especially toothed wheels, should always be replaced at the same time. Generally we recommend replacement of the chain when 75% of the hardening depth is worn and less when toothed wheels are fitted. Damaged or distorted buckets affect the chain centres, causing a contact between the wheel grove, chain and shackle and resulting in premature chain/shackle failure. Such buckets must be replaced or corrected as soon as possible. Nuts, securing the buckets should also be checked regularly and re-tightened as necessary.

Operational information

Central feed is essential for avoiding uneven bucket filling and uneven wear between the two chain strands. If feed conveyors approach the elevator inlet at 900, corrective measures are recommended by use of deflactors, swept inlet or convex inlet floor. Elevator buckets must be fitted completely horizontally. Bucket attachments nuts should be tightened using a torque spanner, ideally when resting on the drive wheels to ensure that correct chain centres are maintained. After approx. 2 weeks operation, all nuts should be re-tightened. We recommend the use of safety discs or self-locking nuts to secure the bucket. Loose buckets could lead to shearing of attachment bolts, and, when using DIN type shackle, to premature fractures due to fatigue.

Recommended torque setting

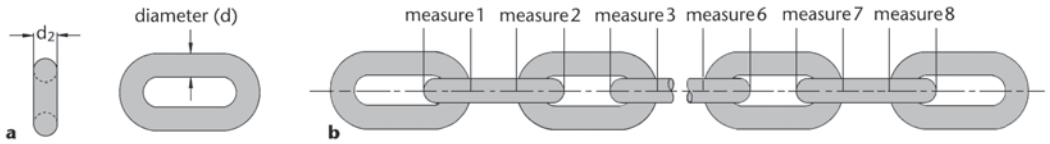
For hexagon nuts to DIN 555 grade 5		For hexagon nuts to DIN 934 grade 8		For self-locking steel nuts to DIN 980V grade 8	
M10	30 Nm	M10	51 Nm	M10	55 Nm
M12	52 Nm	M12	89 Nm	M12	95 Nm
M14	83 Nm	M14	140 Nm	M14	149 Nm
M16	127 Nm	M16	213 Nm	M16	225 Nm
M20	245 Nm	M20	420 Nm	M20	439 Nm
M24	420 Nm	M24	725 Nm	M24	752 Nm
M30	847 Nm	M30	1451 Nm	M30	1487 Nm
M36	1480 Nm	M36	2531 Nm	M36	2575 Nm

Wear calculations

Wear measuring

1. The true material thickness can be measured on the straight bar opposite the weld, assuming that the same shows no signs of wear itself. Two measurements, 90° offset, should be made.
2. The thickness across two connection links are measured using callipers and the values recorded as shown in Table 2.

Measurements should be taken at opposite ends on the left and right chain strand.



Example of measuring wear

Chain 30 mm diameter, quality GEHA 21
(0,1 x hardening depth)

Table 1: Measuring the actual chain wire diameter

	left chain link	right chain link
measurement d	30,1	30,2
measurement d2	30,2	30
average	30,15	30,1

Example of wear calculation

1. Actual chain diameter

formula:	resultant chain diameter (Table 1)	./.	4% (bending loss)	
left strand	30,15	./.	4%	= 28,94
right strand	30,10	./.	4%	= 28,90

3. Wear of hardening range in mm

	left strand	right strand
results		
calculation 1 x 2	57,88	57,80
./.		
lowest measure Table 2	57,10	57,10
wear (mm)	0,78	0,70

Table 2: Measurements of the thickness of the connecting links

	left chain link	right chain link
measure 1	57,2	57,3
measure 2	57,1	57,4
measure 3	57,3	57,3
measure 4	57,4	57,1
measure 5	57,2	57,2
measure 6...	57,4	57,3

2. Case hardening depth

formula	EHT	x	d (nominal) chain diameter /mm)	
left strand	0,10	x	30,0 mm	= 3,0 mm
right strand	0,10	x	30,0 mm	= 3,0 mm

4. Wear of hardening range in %

formula:	wear (mm)		(2 x hardening depth / mm)	x 100
left strand	0,78	/	(2 x 3,0 mm)	x 100
right strand	0,70	/	(2 x 3,0 mm)	x 100

Wear calculation

Table 1: Actual chain diameter

	left chain link	right chain link
measurement d		
measurement d2		
average		

Formula 3

Table 2: Measurements of the thickness of the connecting links

	left chain link	right chain link
measure 1		
measure 2		
measure 3...		

(2 x d [average] ./. 4% ./. lowest measure table 2 = wear of hardening (mm)
(2 x ..... ./. 4% ./. ..... = ... (mm)

wear (mm) ./. (2 x EHT [mm]) x 100 = wear (%)
..... (mm) ./. (2 x ..... [mm])(%) x 100 = (%)

BUCKET CHAINS

View on products in our range
Special customer-made
(please consult us with drawings and samples)

Notes: