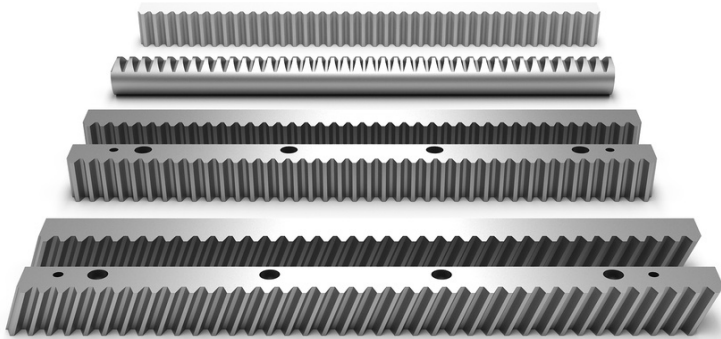


RACK CAPABILITIES

Standard Range:

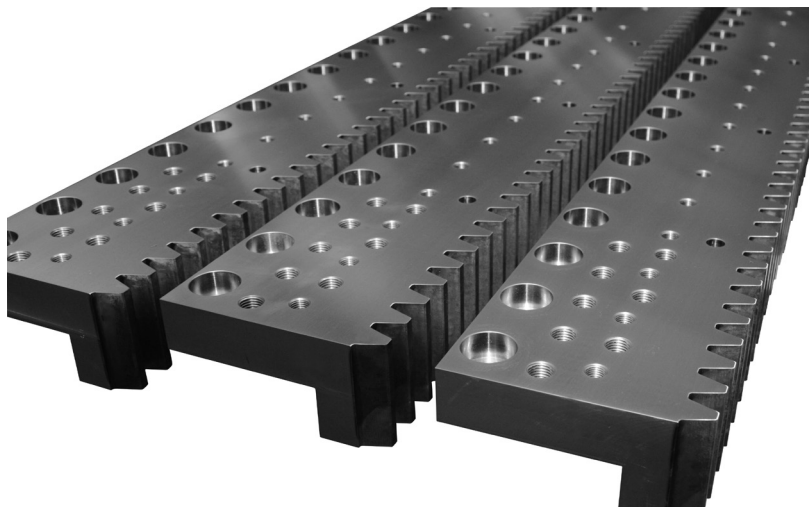
The index on the next page provides an overview of our Standard range of straight (spur) and helical tooth racks. Racks in the standard range are usually in stock allowing for short delivery times. The standard range consists of rectangular and round profile steel racks in modules 1 – 10 with lengths up to 3 meters and quality from AGMA 8 to AGMA 13.



Custom Racks:

In addition to the standard range, Andantex can provide Straight or Helical racks to customer designs with:

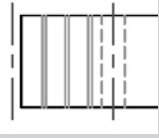
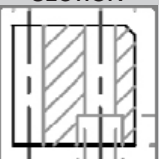
- Precision milled teeth in modules 0.5 - 30 (diametral pitch 50.8 to 0.85) in lengths up to 4 meters.
- Ground Teeth in modules 1-16 (diametral pitch 25.4 to 1.6) in lengths up to 3 meters.
- Quality Levels of up to AGMA 14 (DIN 4)
- Material hardened or plated
- Round Sections
- Stainless Steel
- Plastic



Part Numbering System



RANGE OF RACKS

Style	Series	Module	Heat Treatment	Quality Level	Page
TEETH STRAIGHT (SPUR) 	A10 _ _ _ _	1.5, 2, 2.5 3, 4, 5, 6, 8, 10	Hardened & Ground	6 h 23 (~AGMA 12)	6
	A10 _ _ _ _ Q5	1.5, 2, 2.5, 3, 4, 5, 6, 8, 10	Hardened & Ground	5 h 22 (~AGMA 13)	7
	A12 _ _ _ _	2, 3, 4	Hardened & Ground	6 h 23 (~AGMA 12)	8
	A20 _ _ _ _	2, 3, 4, 5	Quenched & Tempered	8 h 27 (~AGMA 10)	9
	A30 _ _ _ _	1, 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10	Soft	9 h 27 (~AGMA 9)	10
	A32 _ _ _ _	2, 3, 4, 5, 6, 8, 10	Soft	9 h 27 (~AGMA 9)	11
	A40 _ _ _ _	2, 3, 4, 5, 6	Induction Hardened	10 h 27 (~AGMA 8)	12
	A42 _ _ _ _	1, 1.5, 2, 2.5, 3, 4, 5, 6, 8, 10	Induction Hardened	10 h 27 (~AGMA 8)	13
	A44 _ _ _ _	2, 3, 4, 6, 8, 10	Induction Hardened	10 h 27	14
	A50 _ _ _ _	2, 5, 7.5, 10 circular pitch, p	Hardened & Ground	6 h 23 (~AGMA 12)	15
CROSS SECTION 	A60 _ _ _ _	10, 12.5, 16, 20, 25 circular pitch, p	Induction Hardened	9 h 25 (~AGMA 9)	16
	A70 _ _ _ _	2, 5, 7.5, 10, 12.5 circular pitch, p	Soft	7 h 25 (~AGMA 11)	17
	A80 _ _ _ _	1, 1.5, 2, 3, 4	Stainless Steel	8 h 27 (~AGMA 10)	18
	A90 _ _ _ _	1, 1.5, 2, 3, 4	Alloy Steel	8 h 27 (~AGMA 10)	19
	A92 _ _ _ _	1, 1.5, 2, 3	Stainless Steel	8 h 27 (~AGMA 10)	20
	A94 _ _ _ _	1, 1.5, 2, 2.5, 3, 4, 5	Soft	8 h 27 (~AGMA 10)	21
	A11 _ _ _ _	1.5, 2, 2.5, 3, 4, 5, 6, 8, 10	Hardened & Ground	6 h 23 (~AGMA 12)	22
	A11 _ _ _ _ Q5	1.5, 2, 2.5, 3, 4, 5, 6, 8, 10	Hardened & Ground	5 h 22 (~AGMA 13)	23
	A13 _ _ _ _	2, 3, 4	Hardened & Ground	6 h 23 (~AGMA 12)	24
	A19 _ _ _ _	3, 4, 5, 6	Helical High-Strength	6 h 23 (~AGMA 12)	25
TEETH HELICAL 	A21 _ _ _ _	2, 3, 4, 5	Quenched & Tempered	8 h 27 (~AGMA 10)	26
	A31 _ _ _ _	2, 3, 4, 5, 6, 8, 10	Soft	9 h 27 (~AGMA 9)	27
	A41 _ _ _ _	2, 3, 4, 5, 6	Induction Hardened	10 h 27 (~AGMA 8)	28
	Helical, Straight (Spur), 90° & 180°	Racks machined for linear guides 2, 3, 4 Circular pitch 5, 10	Hardened & Ground or Soft	6 h 23 (~AGMA 12) or 9 h 27 (~AGMA 9)	29
	Helical, Straight (Spur), 90° & 180°	Rack, Rail & Bearing Block Assemblies 2, 3, 4 Circular pitch 5, 10	Hardened & Ground or Soft	6 h 23 (~AGMA 12) or 9 h 27 (~AGMA 9)	29

*Note all AGMA quality grades in this catalog are based on AGMA standard 2000-A88.
The new AGMA quality numbers defined in AGMA 2015-1-A01 are similar to the DIN numbers shown.

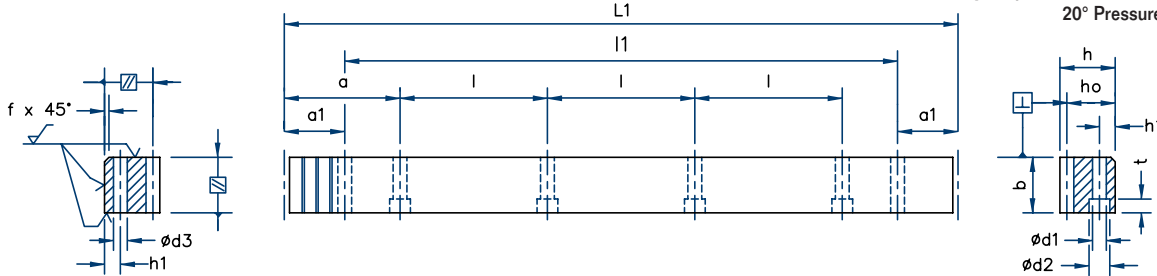
MODULAR RACK & PINION SYSTEM

RACKS

WITH STRAIGHT (SPUR) TEETH

SERIES A10

Case Hardened & Ground Teeth
Tooth Quality DIN 6 h 23 (~AGMA12)
20° Pressure Angle



Module	L1	l1	teeth	b	h	ho	f	a	l	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part no.
1.5	499.5	441.5	106	19	19	17.5	2	62.44	124.88	4	8	7	11	7	29	5.7	0.029	1.3	A10-1.50-050
1.5	499.5		106	19	19	17.5	2										0.029	1.3	A10-1.51-050
1.5	999.0	941	212	19	19	17.5	2	62.44	124.88	8	8	7	11	7	29	5.7	0.043	2.6	A10-1.50-100
1.5	999.0		212	19	19	17.5	2										0.043	2.6	A10-1.51-100
1.5																			A10-1.51-999
Companion Rack For Assembly																			
2.0	502.7	440.1	80	24	24	22	2	62.83	125.66	4	8	7	11	7	31.3	5.7		2.1	A10-020-050
2.0	502.7		80	24	24	22	2											2.1	A10-021-050
2.0	1005.3	942.7	160	24	24	22	2	62.83	125.66	8	8	7	11	7	31.3	5.7	0.036	4.2	A10-020-100
2.0	1005.3		160	24	24	22	2										0.036	4.2	A10-021-100
2.0	2010.6	1948	320	24	24	22	2	62.83	125.66	16	8	7	11	7	31.3	5.7	0.058	8	A10-020-200
2.0	2010.6		320	24	24	22	2										0.058	8	A10-021-200
2.0																			A10-021-999
Companion Rack For Assembly																			
2.5	502.7	440.1	64	24	24	21.5	2	62.83	125.66	4	9	7	11	7	31.3	5.7	0.027	2.0	A10-2.50-050
2.5	502.7		64	24	24	21.5	2										0.027	2.0	A10-2.51-050
2.5	1005.3	942.7	128	24	24	21.5	2	62.83	125.66	8	9	7	11	7	31.3	5.7	0.036	4.1	A10-2.50-100
2.5	1005.3		128	24	24	21.5	2										0.036	4.1	A10-2.51-100
2.5	2010.6	1948	256	24	24	21.5	2	62.83	125.66	16	9	7	11	7	31.3	5.7	0.053	8	A10-2.50-200
2.5	2010.6		256	24	24	21.5	2										0.053	8	A10-2.51-200
2.5																			A10-2.51-999
Companion Rack For Assembly																			
3.0	508.9	440.1	54	29	29	26	2	63.62	127.23	4	9	10	15	9	34.4	7.7		3	A10-030-050
3.0	508.9		54	29	29	26	2											3	A10-031-050
3.0	1017.9	949.1	108	29	29	26	2	63.62	127.23	8	9	10	15	9	34.4	7.7	0.036	6	A10-030-100
3.0	1017.9		108	29	29	26	2										0.036	6	A10-031-100
3.0	2035.8	1967.0	216	29	29	26	2	63.62	127.23	16	9	10	15	9	34.4	7.7	0.055	11.5	A10-030-200
3.0	2035.8		216	29	29	26	2										0.055	11.5	A10-031-200
3.0																			A10-031-999
Companion Rack for Assembly																			
4.0	502.7	427.7	40	39	39	35	3	62.83	125.66	4	12	10	15	9	37.5	7.7		5.3	A10-040-050
4.0	502.7		40	39	39	35	3											5.3	A10-041-050
4.0	1005.3	930.3	80	39	39	35	3	62.83	125.66	8	12	10	15	9	37.5	7.7	0.040	10.5	A10-040-100
4.0	1005.3		80	39	39	35	3										0.040	10.5	A10-041-100
4.0	2010.6	1935.6	160	39	39	35	3	62.83	125.66	16	12	10	15	9	37.5	7.7		21	A10-040-200
4.0	2010.6		160	39	39	35	3											21	A10-041-200
4.0																			A10-041-999
Companion Rack for Assembly																			
5.0	502.6	442.4	32	49	39	34	3	62.83	125.66	4	12	14	20	13	30.1	11.7		6.7	A10-050-050
5.0	502.6		32	49	39	34	3											6.7	A10-051-050
5.0	1005.3	945	64	49	39	34	3	62.83	125.66	8	12	14	20	13	30.1	11.7	0.040	13.4	A10-050-100
5.0	1005.3		64	49	39	34	3										0.040	13.4	A10-051-100
5.0	2010.6	1950.4	128	49	39	34	3	62.83	125.66	16	12	14	20	13	30.1	11.7		26.8	A10-050-200
5.0	2010.6		128	49	39	34	3											26.8	A10-051-200
5.0																			A10-051-999
Companion Rack for Assembly																			
6.0	508.9	446.1	27	59	49	43	3	63.62	127.23	4	16	18	26	17	31.4	15.7		10.1	A10-060-050
6.0	508.9		27	59	49	43	3											10.1	A10-061-050
6.0	1017.8	955	54	59	49	43	3	63.62	127.23	8	16	18	26	17	31.4	15.7	0.040	20.2	A10-060-100
6.0	1017.8		54	59	49	43	3										0.040	20.2	A10-061-100
6.0	2035.8	1973	108	59	49	43	3	63.62	127.23	16	16	18	26	17	31.4	15.7		40.4	A10-060-200
6.0	2035.8		108	59	49	43	3											40.4	A10-061-200
6.0																			A10-061-999
Companion Rack for Assembly																			
8.0	502.7	449.5	20	79	79	71.0	3	62.83	125.66	4	25	22	33	21	26.6	19.7		22.4	A10-080-050
8.0	502.7		20	79	79	71.0	3											22.4	A10-081-050
8.0	1005.3	952	40	79	79	71.0	3	62.83	125.66	8	25	22	33	21	26.6	19.7	0.040	44.8	A10-080-100
8.0	1005.3		40	79	79	71.0	3										0.040	44.8	A10-081-100
8.0	2010.6	1957.3	80	79	79	71.0	3	62.83	125.66	16	25	22	33	21	26.6	19.7		89.5	A10-080-200
8.0	2010.6		80	79	79	71.0	3											89.5	A10-081-200
8.0																			A10-081-999
Companion Rack for Assembly																			
10.0	1005.3	754	32	99	99	89	3	62.83	125.66	8	32	33	48	32	125.7	19.7	0.040	69	A10-100-100
10.0	1005.3		32	99	99	89	3										0.040	69	A10-101-100
10.0																			A10-101-999
Companion Rack for Assembly																			

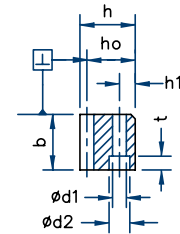
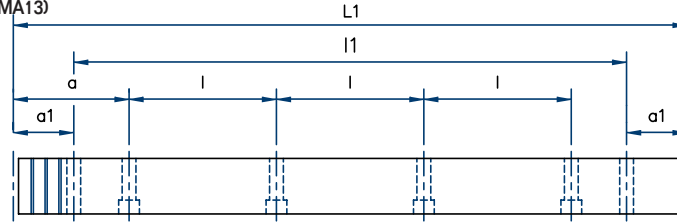
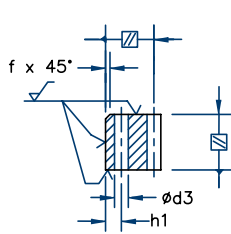
Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Teeth induction hardened to 50-55 Rc; ground on all sides after hardening. Only teeth are hardened allowing subsequent drilling and pinning of rack. Rack ends are machined for continuous mounting. Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

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SERIES A10Q5

Case Hardened & Ground Teeth
Tooth Quality DIN 5 h 22 (~AGMA13)
20° Pressure Angle



RACKS WITH STRAIGHT (SPUR) TEETH

Module	L1	l1	teeth	b	h	h _o	f	a	l	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part No.
1.5	499.51	441.5	106	19	19	17.5	2	62.44	124.88	4	8	7	11	7	29	5.7	0.021	1.3	A10-1.50-050-Q5
1.5	999.03	941.0	212	19	19	17.5	2	62.44	124.88	8	8	7	11	7	29	5.7	0.030	2.6	A10-1.50-100-Q5
1.5	Companion Rack for assembly																		A10-1.51-999
2.0	502.65	440.1	80	24	24	22	2	62.83	125.66	4	8	7	11	7	31.3	5.7	0.018	2.1	A10-020-050-Q5
2.0	1005.31	942.7	160	24	24	22	2	62.83	125.66	8	8	7	11	7	31.3	5.7	0.025	4.2	A10-020-100-Q5
2.0	Companion Rack for assembly																		A10-021-999
2.5	502.65	440.1	64	24	24	21.5	2	62.83	125.66	4	9	7	11	7	31.3	5.7	0.019	2.0	A10-2.50-050-Q5
2.5	1005.31	942.7	128	24	24	21.5	2	62.83	125.66	8	9	7	11	7	31.3	5.7	0.025	4.1	A10-2.50-100-Q5
2.5	Companion Rack for assembly																		A10-2.51-999
3.0	508.94	440.1	54	29	29	26	2	63.62	127.23	4	9	10	15	9	34.4	7.7	0.020	3	A10-030-050-Q5
3.0	1017.88	949.1	108	29	29	26	2	63.62	127.23	8	9	10	15	9	34.4	7.7	0.026	6	A10-030-100-Q5
3.0	Companion Rack for assembly																		A10-031-999
4.0	502.65	427.7	40	39	39	35	2	62.83	125.66	4	12	10	15	9	37.5	7.7	0.021	5.4	A10-040-050-Q5
4.0	1005.31	930.3	80	39	39	35	2	62.83	125.66	8	12	10	15	9	37.5	7.7	0.026	10.8	A10-040-100-Q5
4.0	Companion Rack for assembly																		A10-041-999
5.0	502.65	442.3	32	49	49	34	3	62.83	125.66	4	12	14	20	13	30.2	11.7	0.020	6.6	A10-050-050-Q5
5.0	1005.31	944.9	64	49	49	34	3	62.83	125.66	8	12	14	20	13	30.2	11.7	0.024	13.1	A10-050-100-Q5
5.0	Companion Rack for assembly																		A10-051-999
6.0	508.94	446.1	27	59	49	43	3	63.62	127.23	4	16	18	26	17	31.4	15.7	0.022	10.1	A10-060-050-Q5
6.0	1017.88	955	54	59	49	43	3	63.62	127.23	8	16	18	26	17	31.4	15.7	0.026	20.3	A10-060-100-Q5
6.0	Companion Rack for assembly																		A10-061-999
8.0	502.65	449.3	20	79	79	71.0	3	62.83	125.66	4	25	22	33	21	26.7	19.7	0.021	22.1	A10-080-050-Q5
8.0	1005.31	952	40	79	79	71.0	3	62.83	125.66	8	25	22	33	21	26.7	19.7	0.024	44.3	A10-080-100-Q5
8.0	Companion Rack for assembly																		A10-081-999
10.0	502.65	252.3	16	99	99	89	3	62.83	125.66	4	32	33	48	32	125.2	19.7	0.020	34.8	A10-100-050-Q5
10.0	1005.31	755	32	99	99	89	3	62.83	125.66	8	32	33	48	32	125.2	19.7	0.023	69	A10-100-100-Q5
10.0	Companion Rack for assembly																		A10-101-999

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Teeth induction hardened to 50-55 Rc: ground on all sides after hardening. Only teeth are hardened allowing subsequent drilling and pinning of rack. Rack ends are machined for continuous mounting.

Fp is the max cumulative pitch error for the corresponding rack length.

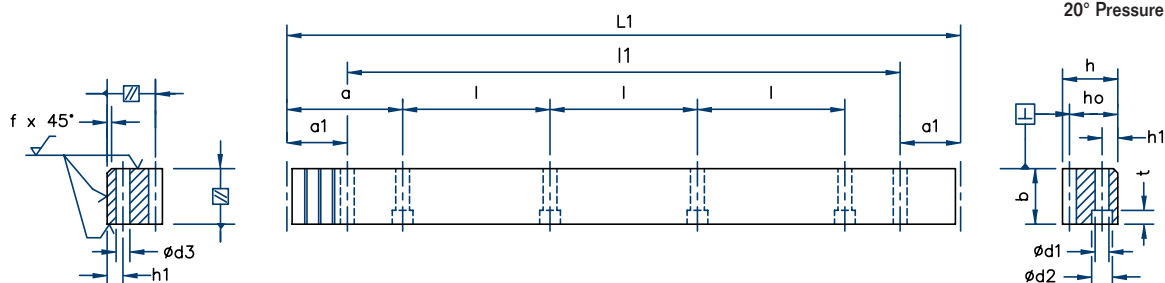
Dimensions are in mm and are subject to change - consult factory.

RACKS

WITH STRAIGHT (SPUR) TEETH

SERIES A12

Case Hardened & Ground Teeth
Tooth Quality DIN 6 h 23 (~AGMA12)
20° Pressure Angle



Module	L1	l1	teeth	b	h	ho	f	a	l	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part no.	
2.0	502.7	440.1	80	24	24	22	2	62.83	125.66	4	8	7	11	7	31.3	5.7		2.1	A12-020-050	
2.0	502.7		80	24	24	22	2				Without Holes							2.1	A12-021-050	
2.0	1005.3	942.7	160	24	24	22	2	62.83	125.66	8	8	7	11	7	31.3	5.7	0.036	4.2	A12-020-100	
2.0	1005.3		160	24	24	22	2				Without Holes							0.036	4.2	A12-021-100
2.0	Companion Rack For Assembly																		A10-021-999	
3.0	508.9	440.1	54	29	29	26	2	63.62	127.23	4	9	10	15	9	34.4	7.7		3	A12-030-050	
3.0	508.9		54	29	29	26	2				Without Holes							3	A12-031-050	
3.0	1017.9	949.1	108	29	29	26	2	63.62	127.23	8	9	10	15	9	34.4	7.7	0.036	6	A12-030-100	
3.0	1017.9		108	29	29	26	2				Without Holes							0.036	6	A12-031-100
3.0	Companion Rack for Assembly																		A10-031-999	
4.0	502.7	427.7	40	39	39	35	3	62.83	125.66	4	12	10	15	9	37.5	7.7		5.3	A12-040-050	
4.0	502.7		40	39	39	35	3				Without Holes							5.3	A12-041-050	
4.0	1005.3	930.3	80	39	39	35	3	62.83	125.66	8	12	10	15	9	37.5	7.7	0.04	10.6	A12-040-100	
4.0	1005.3		80	39	39	35	3				Without Holes							0.04	10.6	A12-041-100
4.0	Companion Rack for Assembly																		A10-041-999	

Material AISI 5115 (16MnCr5) Teeth induction hardened to 60 Rc: ground on all sides after hardeneing. Only teeth are hardened allowing subsequent drilling and pinning of rack. Rack ends are machined for continuous mounting.

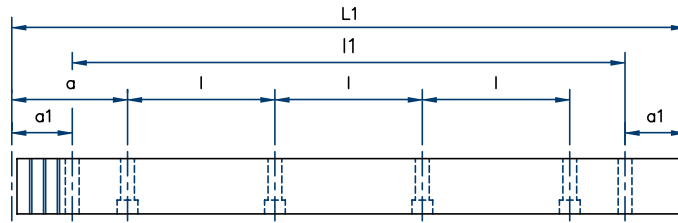
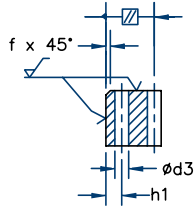
Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

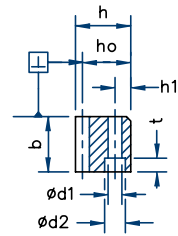
MODULAR RACK & PINION SYSTEM

SERIES A20

Quenched & Tempered Material
Quality DIN 8 h 27 (-AGMA10)
20° Pressure Angle



RACKS WITH STRAIGHT (SPUR) TEETH



Module	L1	l1	teeth	b	h	ho	f	a	l	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part no.
2.0	502.7	440.1	80	24	24	22	2	62.83	125.66	4	8	7	11	7	31.3	5.7	2.2	2.2	A20-020-050
2.0	502.7		80	24	24	22	2				without holes						2.2		A20-021-050
2.0	1005.3	942.7	160	24	24	22	2	62.83	125.66	8	8	7	11	7	31.3	5.7	0.063	4.3	A20-020-100
2.0	1005.3		160	24	24	22	2				without holes						0.063	4.3	A20-021-100
2.0	2010.6	1948	320	24	24	22	2	62.83	125.66	16	8	7	11	7	31.3	5.7		8.6	A20-020-200
2.0	2010.6		320	24	24	22	2				without holes							8.6	A20-021-200
2.0			Companion Rack For Assembly																A10-021-999-W
3.0	508.9	440.1	54	29	29	26	2	63.62	127.23	4	9	10	15	9	34.4	7.7	3.1	3.1	A20-030-050
3.0	508.9		54	29	29	26	2				without holes						3.1		A20-031-050
3.0	1017.9	949.1	108	29	29	26	2	63.62	127.23	8	9	10	15	9	34.4	7.7	0.071	6.2	A20-030-100
3.0	1017.9		108	29	29	26	2				without holes						0.071	6.2	A20-031-100
3.0	2035.8	1967	216	29	29	26	2	63.62	127.23	16	9	10	15	9	34.4	7.7		12.4	A20-030-200
3.0	2035.8		216	29	29	26	2				without holes							12.4	A20-031-200
3.0			Companion Rack for Assembly																A10-031-999-W
4.0	502.7	427.7	40	39	39	35	3	62.83	125.66	4	12	10	15	9	37.5	7.7	5.5	5.5	A20-040-050
4.0	502.7		40	39	39	35	3				without holes						5.5		A20-041-050
4.0	1005.3	930.3	80	39	39	35	3	62.83	125.66	8	12	10	15	9	37.5	7.7	0.08	11	A20-040-100
4.0	1005.3		80	39	39	35	3				without holes						0.08	11	A20-041-100
4.0	2010.6	1935.6	160	39	39	35	3	62.83	125.66	16	12	10	15	9	37.5	7.7		22	A20-040-200
4.0	2010.6		160	39	39	35	3				without holes							22	A20-041-200
4.0			Companion Rack for Assembly																A10-041-999-W
5.0	502.7	442.3	32	49	49	34	3	62.83	125.66	4	12	14	20	13	30.2	11.7	6.8	6.8	A20-050-050
5.0	502.7		32	49	49	34	3				without holes						6.8		A20-051-050
5.0	1005.3	945.0	64	49	49	34	3	62.83	125.66	8	12	14	20	13	30.2	11.7	0.08	13.6	A20-050-100
5.0	1005.3		64	49	49	34	3				without holes						0.08	13.6	A20-051-100
5.0	2010.6	1950.0	128	49	49	34	3	62.83	125.66	16	12	14	20	13	30.2	11.7		27.2	A20-050-200
5.0	2010.6		128	49	49	34	3				without holes							27.2	A20-051-200
5.0			Companion Rack for Assembly																A10-051-999-W

Material AISI 4140 (42CrMo4V) with tensile strength = 900 N/mm² (130,500 PSI).

Back and contact face ground. Rack ends are machined for continuous mounting.

Fp is the max cumulative pitch error for the corresponding rack length.

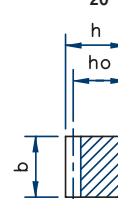
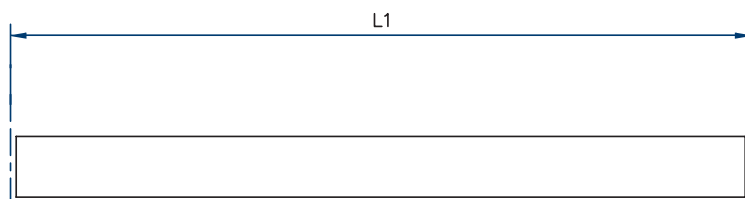
Dimensions are in mm and are subject to change - consult factory.

RACKS

WITH STRAIGHT (SPUR) TEETH

SERIES A30

Soft Rack
Tooth Quality DIN 9 h 27 (~AGMA 9)
20° Pressure Angle



Module	L1	teeth	b	h	ho	a	l	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part no.
1.0	499.51	159	10	9.8	8.8				without holes							0.35	A30-011-050
1.0	999.03	318	10	9.8	8.8				without holes						0.09	0.7	A30-011-100
1.0									Companion Rack for Assembly								A30-011-999
1.5	499.51	106	15	14.8	13.3				without holes							0.8	A30-1.51-050
1.5	999.03	212	15	14.8	13.3				without holes						0.09	1.6	A30-1.51-100
1.5	1998.05	424	15	14.8	13.3				without holes							3.1	A30-1.51-200
1.5									Companion Rack for assembly								A30-1.51-999
2.0	502.65	80	20	19.75	17.75				without holes							1.4	A30-021-050
2.0	1005.31	160	20	19.75	17.75				without holes						0.09	2.8	A30-021-101
2.0	2010.62	320	20	19.75	17.75				without holes							5.6	A30-021-201
2.0	3015.9	480	20	19.75	17.75				without holes							8.5	A30-021-300
2.0									Companion Rack For Assembly								A10-021-999-W
2.5	502.65	64	25	24.75	22.25				without holes							2.1	A30-2.51-050
2.5	1005.31	128	25	24.75	22.25				without holes						0.100	4.2	A30-2.51-101
2.5	2010.62	256	25	24.75	22.25				without holes							8.4	A30-2.51-201
2.5	3015.93	384	25	24.75	22.25				without holes							12.6	A30-2.51-301
2.5									Companion Rack For Assembly								A30-2.51-999
3.0	508.94	54	30	29.75	26.75				without holes							3.1	A30-031-051
3.0	1017.88	108	30	29.75	26.75				without holes						0.100	6.2	A30-031-101
3.0	2035.75	216	30	29.75	26.75				without holes							12.4	A30-031-201
3.0	3053.62	324	30	29.75	26.75				without holes							19.3	A30-031-300
3.0									Companion Rack for Assembly								A10-031-999-W
4.0	502.65	40	40	39.7	35.7				without holes							5.5	A30-041-050
4.0	1005.31	80	40	39.7	35.7				without holes						0.110	11	A30-041-100
4.0	2010.62	160	40	39.7	35.7				without holes							22	A30-041-201
4.0	3015.92	240	40	39.7	35.7				without holes							33.9	A30-041-300
4.0									Companion Rack for Assembly								A10-041-999-W
5.0	502.65	32	50	49.7	44.7				without holes							8.6	A30-051-050
5.0	1005.31	64	50	49.7	44.7				without holes						0.110	17.2	A30-051-100
5.0	2010.62	128	50	49.7	44.7				without holes							34.4	A30-051-200
5.0	3015.93	192	50	49.7	44.7				without holes							51.6	A30-051-300
5.0									Companion Rack for Assembly								A10-051-999-W
6.0	508.94	27	60	59.65	53.65				without holes							12.3	A30-061-050
6.0	1017.88	54	60	59.65	53.65				without holes						0.110	24.5	A30-061-101
6.0	2035.75	108	60	59.65	53.65				without holes							49	A30-061-201
6.0									Companion Rack for Assembly								A10-061-999-W
8.0	502.65	20	80	79.6	71.6				without holes							21.4	A30-081-050
8.0	1005.31	40	80	79.6	71.6				without holes						0.110	42.7	A30-081-100
8.0	2010.62	80	80	79.6	71.6				without holes							85.4	A30-081-200
8.0									Companion Rack for Assembly								A10-081-999-W
10.0	1005.3	32	100	99.6	89.6				without holes						0.110	70.6	A30-101-100
10.0									Companion Rack for Assembly								A10-101-999-W

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI).
Rack ends are machined for continuous mounting.

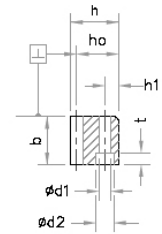
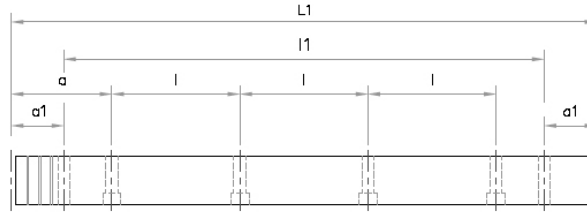
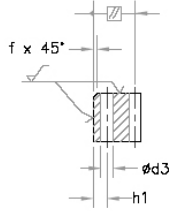
Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

MODULAR RACK & PINION SYSTEM

SERIES A32

Soft Rack
Quality DIN 9 h 27 (-AGMA 9)
20° Pressure Angle



Module	L1	l1	teeth	b	h	ho	a	l	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part no.
2.0	502.65	440.1	80	20	19.75	17.75	62.80	125.66	4	8	7	11	7	31.3	5.7	1.4		A32-020-050
2.0	1005.31	942.7	160	20	19.75	17.75	62.80	125.66	8	8	7	11	7	31.3	5.7	0.090	2.8	A32-020-100
2.0	2010.62	1948.0	320	20	19.75	17.75	62.80	125.66	16	8	7	11	7	31.3	5.7		5.6	A32-020-200
2.0	Companion Rack for Assembly																	A10-021-999-W
3.0	508.94	440.1	54	30	29.75	26.75	63.60	127.23	4	9	10	15	9	34.4	7.7		3.1	A32-030-050
3.0	1017.88	949.1	108	30	29.75	26.75	63.60	127.23	8	9	10	15	9	34.4	7.7	0.100	6.2	A32-030-100
3.0	2035.75	1967.0	216	30	29.75	26.75	63.60	127.23	16	9	10	15	9	34.4	7.7		12.4	A32-030-200
3.0	Companion Rack for Assembly																	A10-031-999-W
4.0	502.65	427.7	40	40	39.70	35.70	62.83	125.66	4	12	10	15	9	37.5	7.7		5.5	A32-040-050
4.0	1005.31	930.3	80	40	39.70	35.70	62.83	125.66	8	12	10	15	9	37.5	7.7	0.110	11.0	A32-040-100
4.0	2010.62	1935.6	160	40	39.70	35.70	62.83	125.66	16	12	10	15	9	37.5	7.7		22.0	A32-040-200
4.0	Companion Rack for Assembly																	A10-041-999-W
5.0	502.65	442.3	32	50	49.70	44.70	62.83	125.66	4	12	14	20	13	30.2	11.7		8.6	A32-050-050
5.0	1005.31	945	64	50	49.70	44.70	62.83	125.66	8	12	14	20	13	30.2	11.7	0.110	17.2	A32-050-100
5.0	2010.62	1950.3	128	50	49.70	44.70	62.83	125.66	16	12	14	20	13	30.2	11.7		34.4	A32-050-200
5.0	Companion Rack for Assembly																	A10-051-999-W
6.0	508.94	446.1	27	60	59.65	53.65	63.62	127.23	4	16	18	26	17	31.4	15.7		12.3	A32-060-050
6.0	1017.88	955	54	60	59.65	53.65	63.62	127.23	8	16	18	26	17	31.4	15.7	0.110	24.5	A32-060-100
6.0	2035.75	1972.9	108	60	59.65	53.65	63.62	127.23	16	16	18	26	17	31.4	15.7		49.0	A32-060-200
6.0	Companion Rack for Assembly																	A10-061-999-W
8.0	502.65	449.5	20	80	79.60	71.60	62.83	125.66	4	25	22	33	21	26.6	19.7		21.4	A32-080-050
8.0	1005.31	952.0	40	80	79.60	71.60	62.83	125.66	8	25	22	33	21	26.6	19.7	0.110	42.7	A32-080-100
8.0	2010.62	1957.3	80	80	79.60	71.60	62.83	125.66	16	25	22	33	21	26.6	19.7		85.4	A32-080-200
8.0	Companion Rack for Assembly																	A10-081-999-W
10.0	1005.31	754.0	32	100	99.60	89.60	62.83	125.66	8	32	33	48	32	125.7	19.7	0.110	70.6	A32-100-100
10.0	Companion Rack for Assembly																	A10-101-999-W

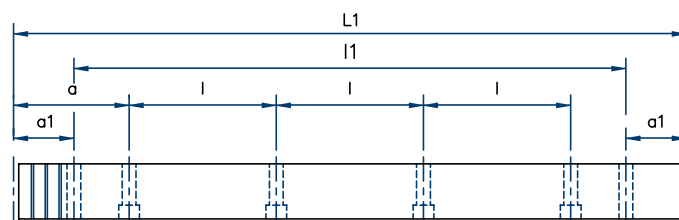
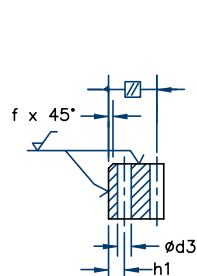
Material AISI 1045 (C45) with tensile strength = 650 N/mm2 (95,000 PSI).
Rack ends are machined for continuous mounting

Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

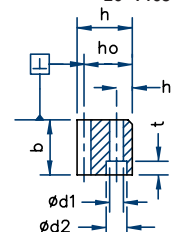
RACKS

WITH STRAIGHT (SPUR) TEETH



SERIES A40

Induction Hardened Teeth
Quality DIN 10 h 27 (~AGMA 8)
20° Pressure Angle



Module	L1	l1	teeth	b	h	ho	f	a	l	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part no.
2.0	502.7	440.1	80	24	24	22	2	62.83	125.66	4	8	7	11	7	31.3	5.7		2.1	A40-020-050
2.0	502.7		80	24	24	22	2				without holes							2.1	A40-021-050
2.0	1005.3	942.7	160	24	24	22	2	62.83	125.66	8	8	7	11	7	31.3	5.7	0.140	4.2	A40-020-100
2.0	1005.3		160	24	24	22	2				without holes						0.140	4.2	A40-021-100
2.0	2010.61	1948	320	24	24	22	2	62.83	125.66	16	8	7	11	7	31.3	5.7		8.4	A40-020-200
2.0	2010.61		320	24	24	22	2				without holes							8.4	A40-021-200
2.0	Companion Rack For Assembly																		A10-021-999-W
3.0	508.9	440.1	54	29	29	26	2	63.62	127.23	4	9	10	15	9	34.4	7.7		3	A40-030-050
3.0	508.9		54	29	29	26	2				without holes							3	A40-031-050
3.0	1017.9	949.1	108	29	29	26	2	63.63	127.23	8	9	10	15	9	34.4	7.7	0.160	6	A40-030-100
3.0	1017.9		108	29	29	26	2				without holes						0.160	6	A40-031-100
3.0	2035.75	1967.0	216	29	29	26	2	63.63	127.23	16	9	10	15	9	34.4	7.7		12	A40-030-200
3.0	2035.75		216	29	29	26	2				without holes							12	A40-031-200
3.0	Companion Rack for Assembly																		A10-031-999-W
4.0	502.7	427.7	40	39	39	35	3	62.83	125.66	4	12	10	15	9	37.5	7.7		5.3	A40-040-050
4.0	502.7		40	39	39	35	3				without holes							5.3	A40-041-050
4.0	1005.3	930.3	80	39	39	35	3	62.83	125.66	8	12	10	15	9	37.5	7.7	0.180	10.5	A40-040-100
4.0	1005.3		80	39	39	35	3				without holes						0.180	10.5	A40-041-100
4.0	2010.61	1935.6	160	39	39	35	3	62.83	125.66	16	12	10	15	9	37.5	7.7		21.2	A40-040-200
4.0	2010.61		160	39	39	35	3				without holes							21.2	A40-041-200
4.0	Companion Rack for Assembly																		A10-041-999-W
5.0	502.65	442.3	32	49	39	34	3	62.83	125.66	4	12	14	20	13	30.2	11.7		6.9	A40-050-050
5.0	502.65		32	49	39	34	3				without holes							6.9	A40-051-050
5.0	1005.3	945	64	49	39	34	3	62.83	125.66	8	12	14	20	13	30.2	11.7	0.180	13.8	A40-050-100
5.0	1005.3		64	49	39	34	3				without holes						0.180	13.8	A40-051-100
5.0	2010.61	1950.3	128	49	39	34	3	62.83	125.66	16	12	14	20	13	30.2	11.7		27.6	A40-050-200
5.0	2010.61		128	49	39	34	3				without holes							27.6	A40-051-200
5.0	Companion Rack for Assembly																		A10-051-999-W
6.0	508.93	446.1	27	59	49	43	3	63.62	127.23	4	16	18	26	17	31.4	15.7		10.5	A40-060-050
6.0	508.93		27	59	49	43	3				without holes							10.5	A40-061-050
6.0	1017.87	955	54	59	49	43	3	63.62	127.23	8	16	18	26	17	31.4	15.7	0.180	21	A40-060-100
6.0	1017.87		54	59	49	43	3				without holes						0.180	21	A40-061-100
6.0	2035.75	1972.9	108	59	49	43	3	63.62	127.23	16	16	18	26	17	31.4	15.7		42	A40-060-200
6.0	2035.75		108	59	49	43	3				without holes							42	A40-061-200
6.0	Companion Rack for Assembly																		A10-061-999-W

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Teeth are induction hardened to 50-55Rc. Back and contact faces are machined after hardening. Only teeth are induction hardened allowing subsequent drilling and pinning of the rack. Rack ends are machined for continuous mounting.

Fp is the max cumulative pitch error for the corresponding rack length.

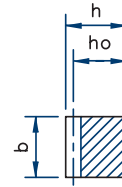
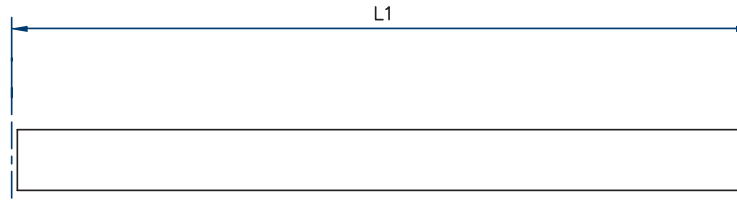
Dimensions are in mm and are subject to change - consult factory.

MODULAR RACK & PINION SYSTEM

SERIES A42

Induction Hardened Teeth
Tooth Quality DIN 10 h 27 (~AGMA 8)
20° Pressure Angle

RACKS WITH STRAIGHT (SPUR) TEETH



Module	L1	teeth	b	h	ho	a	l	holes	h1	d1	d2	t	a1	d3	Fp	kg.	Part no.
1.0	499.51	159	10	9.8	8.8					Without Holes						0.34	A42-011-050
1.0	999.02	318	10	9.8	8.8					Without Holes					0.140	0.68	A42-011-100
1.0										Companion Rack for Assembly							A30-011-999
1.5	499.51	106	15	14.8	13.3					Without Holes						0.78	A42-1.51-050
1.5	999.02	212	15	14.8	13.3					Without Holes					0.140	1.55	A42-1.51-100
1.5	1998.05	424	15	14.8	13.3					Without Holes						3.1	A42-1.51-200
1.5										Companion Rack for assembly							A30-1.51-999
2.0	502.65	80	20	19.75	17.75					Without Holes						1.4	A42-021-050
2.0	1005.31	160	20	19.75	17.75					Without Holes					0.140	2.8	A42-021-101
2.0	2010.62	320	20	19.75	17.75					Without Holes						5.6	A42-021-201
2.0										Companion Rack for assembly							A10-021-999-W
2.5	502.65	64	25	24.75	22.25					Without Holes						2.1	A42-2.51-050
2.5	1005.31	128	25	24.75	22.25					Without Holes					0.160	4.2	A42-2.51-101
2.5	2010.62	256	25	24.75	22.25					Without Holes						8.4	A42-2.51-201
2.5										Companion Rack for assembly							A30-2.51-999
3.0	508.94	54	30	29.75	26.75					Without Holes						3.1	A42-031-051
3.0	1017.88	108	30	29.75	26.75					Without Holes					0.160	6.2	A42-031-101
3.0	2035.75	216	30	29.75	26.75					Without Holes						12.4	A42-031-201
3.0										Companion Rack for assembly							A10-031-999-W
4.0	502.65	40	40	39.7	35.7					Without Holes						5.5	A42-041-050
4.0	1005.31	80	40	39.7	35.7					Without Holes					0.180	11	A42-041-100
4.0	2010.62	160	40	39.7	35.7					Without Holes						22	A42-041-201
4.0										Companion Rack for assembly							A10-041-999-W
5.0	502.65	32	50	49.7	44.7					Without Holes						8.6	A42-051-050
5.0	1005.31	64	50	49.7	44.7					Without Holes					0.180	17.2	A42-051-100
5.0	2010.62	128	50	49.7	44.7					Without Holes						34.4	A42-051-200
5.0										Companion Rack for assembly							A10-051-999-W
6.0	508.93	27	60	59.65	53.65					Without Holes						12.3	A42-061-050
6.0	1017.88	54	60	59.65	53.65					Without Holes					0.180	24.5	A42-061-101
6.0	2035.75	108	60	59.65	53.65					Without Holes						49	A42-061-201
6.0										Companion Rack for assembly							A10-061-999-W
8.0	502.65	20	80	79.6	71.6					Without Holes						21.4	A42-081-050
8.0	1005.31	40	80	79.6	71.6					Without Holes					0.180	42.7	A42-081-100
8.0	2010.62	80	80	79.6	71.6					Without Holes						85.4	A42-081-200
8.0										Companion Rack for assembly							A10-081-999-W
10.0	1005.31	32	100	99	89.6					Without Holes					0.180	70.6	A42-101-100
10.0										Companion Rack for assembly							A10-101-999-W

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Teeth are induction hardened to 50-55Rc. Only teeth are induction hardened allowing subsequent drilling and pinning of the rack. Rack ends are machined for continuous mounting.

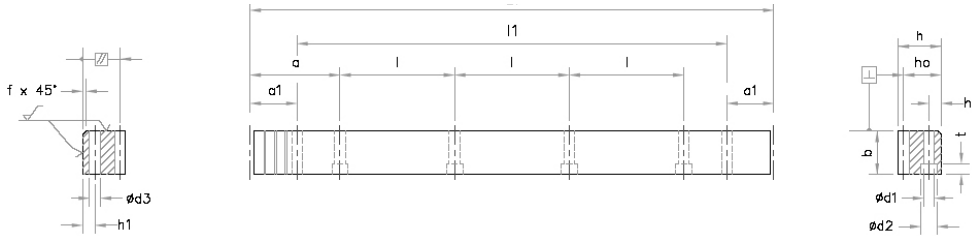
Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

RACKS WITH STRAIGHT (SPUR) TEETH

SERIES A44

Induction Hardened Teeth
Tooth Quality DIN 10 h 27 (~AGMA 8)
20° Pressure Angle



Module	L1	l1	teeth	b	h	ho	a	l	holes	h1	d1	d2	t	a1	d3	Fp	kg.	Part no.
2.0	502.65	440.1	80	20	19.75	17.75	62.83	125.66	4	8	7	11	7	31.3	5.7		1.4	A44-020-050
2.0	1005.31	942.7	160	20	19.75	17.75	62.83	125.66	8	8	7	11	7	31.3	5.7	0.140	2.8	A44-020-100
2.0	2010.62	1948.0	320	20	19.75	17.75	62.83	125.66	16	8	7	11	7	31.3	5.7		5.6	A44-020-200
2.0	Companion Rack for assembly																	A10-021-999-W
3.0	508.94	440.1	54	30	29.75	26.75	63.6	127.23	4	9	10	15	9	34.4	7.7		3.1	A44-030-050
3.0	1017.88	949.1	108	30	29.75	26.75	63.6	127.23	8	9	10	15	9	34.4	7.7	0.160	6.2	A44-030-100
3.0	2035.75	1967.0	216	30	29.75	26.75	63.6	127.23	16	9	10	15	9	34.4	7.7		12.4	A44-030-200
3.0	Companion Rack for assembly																	A10-031-999-W
4.0	502.65	427.7	40	40	39.70	35.70	62.83	125.66	4	12	10	15	9	37.5	7.7		5.5	A44-040-050
4.0	1005.31	930.3	80	40	39.70	35.70	62.83	125.66	8	12	10	15	9	37.5	7.7	0.180	11.0	A44-040-100
4.0	2010.62	1935.6	160	40	39.70	35.70	62.83	125.66	16	12	10	15	9	37.5	7.7		22.0	A44-040-200
4.0	Companion Rack for assembly																	A10-041-999-W
5.0	502.65	442.3	32	50	49.70	44.70	62.83	125.66	4	12	14	20	13	30.2	11.7		8.6	A44-050-050
5.0	1005.31	945.0	64	50	49.70	44.70	62.83	125.66	8	12	14	20	13	30.2	11.7	0.180	17.2	A44-050-100
5.0	2010.62	1950.3	128	50	49.70	44.70	62.83	125.66	16	12	14	20	13	30.2	11.7		34.4	A44-050-200
5.0	Companion Rack for assembly																	A10-051-999-W
6.0	508.94	446.1	27	60	59.65	53.65	63.6	127.23	4	16	18	26	17	31.4	15.7		12.3	A44-060-050
6.0	1017.88	955.0	54	60	59.65	53.65	63.6	127.23	8	16	18	26	17	31.4	15.7	0.180	24.5	A44-060-101
6.0	2035.75	1972.9	108	60	59.65	53.65	63.6	127.23	16	16	18	26	17	31.4	15.7		49	A44-060-200
6.0	Companion Rack for assembly																	A10-061-999-W
8.0	502.65	449.5	20	80	79.6	71.6	62.83	125.66	4	25	22	33	21	26.6	19.7		21.4	A44-080-050
8.0	1005.31	952.0	40	80	79.6	71.6	62.83	125.66	8	25	22	33	21	26.6	19.7	0.180	42.7	A44-080-100
8.0	2010.62	1957.3	80	80	79.6	71.6	62.83	125.66	16	25	22	33	21	26.6	19.7		85.4	A44-080-200
8.0	Companion Rack for assembly																	A10-081-999-W
10.0	1005.31	754.00	32	100	99.6	89.6	62.83	125.66	8	32	33	48	32	125.7	19.7	0.180	70.6	A44-100-100
10.0	Companion Rack for assembly																	A10-101-999-W

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Teeth are induction hardened to 50-55Rc. Only teeth are induction hardened allowing subsequent drilling and pinning of the rack. Rack ends are machined for continuous mounting.

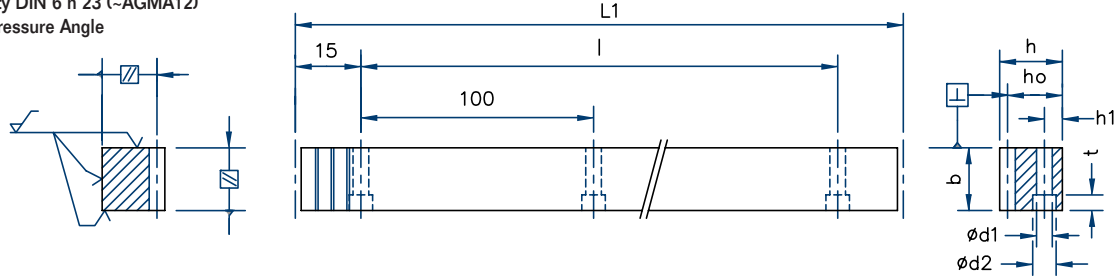
Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

SERIES A50

Case Hardened & Ground Teeth
Quality DIN 6 h 23 (~AGMA12)
20° Pressure Angle

RACKS WITH CIRCULAR PITCH STRAIGHT (SPUR) TEETH



Circular Pitch, p	Module	L1	L	teeth	b	h	ho	Np. holes	h1	d1	d2	t	Fp	mass kg.	Part No.
2.0	0.637	330	300	165	9.5	19.5	18.86	3	10.5	5.8	10	5.7	0.032	0.45	A50-020-033
2.0	0.637	1030	1000	515	9.5	19.5	18.86	10	10.5	5.8	10	5.7	0.068	1.4	A50-020-103
2.0	0.637	Companion Rack for assembly													A50-021-999
5.0	1.592	330	300	66	14.5	24.5	22.91	3	13	7	11	6.8	0.023	0.85	A50-050-033
5.0	1.592	1030	1000	206	14.5	24.5	22.91	10	13	7	11	6.8	0.043	2.6	A50-050-103
5.0	1.592	330	300	66	19.5	29.5	27.91	3	15.5	9	15	9	0.023	1.35	A50-050-033-19.5
5.0	1.592	1030	1000	206	19.5	29.5	27.91	10	15.5	9	15	9	0.043	4.2	A50-050-103-19.5
5.0	1.592	Companion Rack for assembly													A50-051-999
7.5	2.387	330	300	44	24.7	33	30.61	3	18.5	9	15	9	0.024	1.9	A50-7.50-033
7.5	2.387	1230	1200	164	24.7	33	30.61	12	18.5	9	15	9	0.041	7	A50-7.50-123
7.5	2.387	Companion Rack for assembly													A50-7.51-999
10.0	3.183	330	300	33	34.6	46.6	43.42	3	28.6	11	18	11	0.025	3.7	A50-100-033
10.0	3.183	1230	1200	123	34.6	46.6	43.42	12	28.6	11	18	11	0.04	13.9	A50-100-123
10.0	3.183	Companion Rack for assembly													A50-101-999

Material AISI 6150 (58CrMoV4). Teeth induction hardened to 50-60 Rc; ground on all sides after hardening. Only teeth are hardened allowing subsequent drilling and pinning of rack. Rack ends are machined for continuous mounting.

Fp is the max cumulative pitch error for the corresponding rack length.

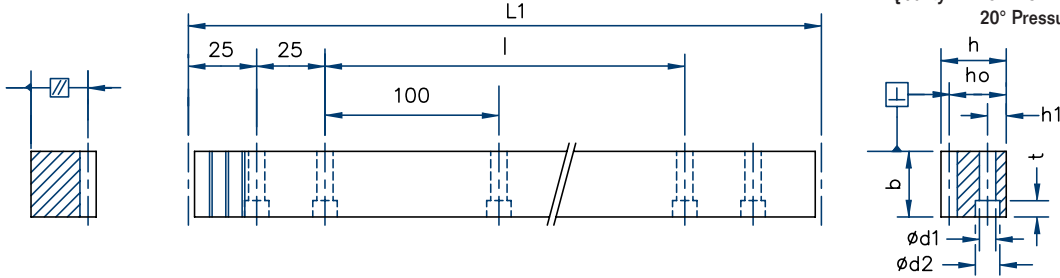
Dimensions are in mm and are subject to change - consult factory.

RACKS

WITH CIRCULAR PITCH STRAIGHT (SPUR) TEETH

SERIES A60

Induction Hardened Teeth
Quality DIN 9 h 25 (-AGMA 9)
20° Pressure Angle



Circular Pitch, p	Module	L1	L	teeth	b	h	h _o	No. holes	h1	d1	d2	t	Fp	mass kg.	Part No.
10.0	3.183	800	700	80	29	29	25.82	10	11.5	9	15	9	0.092	4.8	A60-100-080
10.0	3.183	1200	1100	120	29	29	25.82	14	11.5	9	15	9	0.108	7.2	A60-100-120
10.0	3.183	2000	1900	200	29	29	25.82	22	11.5	9	15	9	0.142	12	A60-100-200
10.0	3.183	Companion Rack for assembly													A50-101-999
12.5	3.979	800	700	64	39	39	35.02	10	14	11	18	11	0.094	9.8	A60-12.50-080
12.5	3.979	1200	1100	96	39	39	35.02	14	14	11	18	11	0.108	13.5	A60-12.50-120
12.5	3.979	2000	1900	160	39	39	35.02	22	14	11	18	11	0.137	22.5	A60-12.50-200
12.5	3.979	Companion Rack for assembly													A60-12.51-999
16.0	5.093	800	700	50	49	49	43.91	10	24	13.5	20	13	0.088	14.2	A60-160-080
16.0	5.093	1200	1100	75	49	49	43.91	14	24	13.5	20	13	0.099	21.2	A60-160-120
16.0	5.093	2000	1900	125	49	49	43.91	22	24	13.5	20	13	0.121	35.3	A60-160-200
16.0	5.093	Companion Rack for assembly													A60-161-999
20.0	6.366	800	700	40	59	59	52.63	10	29	13.5	20	13	0.094	20.2	A60-200-080
20.0	6.366	1200	1100	60	59	59	52.63	14	29	13.5	20	13	0.104	30.3	A60-200-120
20.0	6.366	2000	1900	100	59	59	52.63	22	29	13.5	20	13	0.125	50.5	A60-200-200
20.0	6.366	Companion Rack for assembly													A60-201-999
25.0	7.958	800	700	32	79	79	71.04	10	39	17.5	26	17.5	0.09	35.7	A60-250-080
25.0	7.958	1200	1100	48	79	79	71.04	14	39	17.5	26	17.5	0.098	53.6	A60-250-120
25.0	7.958	2000	1900	80	79	79	71.04	22	39	17.5	26	17.5	0.115	89.3	A60-250-200
25.0	7.958	Companion Rack for assembly													A60-251-999

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI).

Teeth are induction hardened to 50-55Rc. Back and contact faces are machined after hardening.

Only teeth are induction hardened allowing subsequent drilling and pinning of the rack.

Rack ends are machined for continuous mounting.

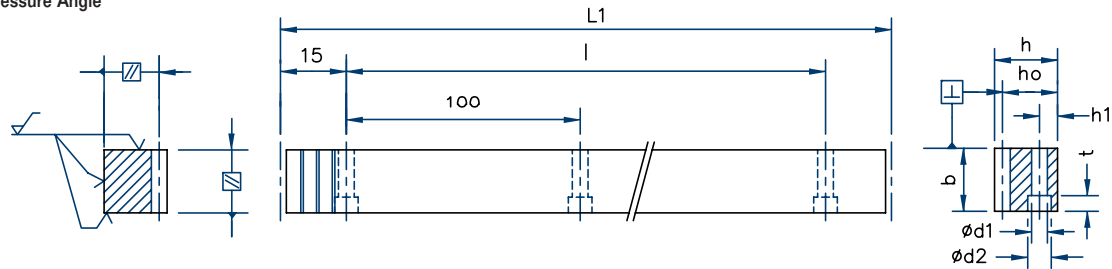
Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

SERIES A70

Soft Teeth
Tooth Quality DIN 7 h 25 (~AGMA 11)
20° Pressure Angle

RACKS WITH CIRCULAR PITCH STRAIGHT (SPUR) TEETH



Circular Pitch, p	Module	L1	teeth	b	h	h _o	l	No. holes	h1	d1	d2	t	Fp	mass kg.	Part No.
2.0	0.637	1000	500	9.5	9.5	8.86								0.7	A70-021-100
2.0	0.637	1030	515	9.5	19.5	18.86	1000	11	10.5	5.8	10	5.7	0.079	1.4	A70-020-103
2.0	0.637														A50-021-999
															Companion Rack for assembly
5.0	1.592	1000	200	14.5	14.5	12.9								1.5	A70-051-100
5.0	1.592	1030	206	14.5	24.5	22.91	1000	11	13	7	11	6.8	0.058	2.6	A70-050-103
5.0	1.592	1030	206	19.5	29.5	27.91	1000	11	15.5	9	15	9	0.058	4.2	A70-050-103-19.5
5.0	1.592														A50-051-999
															Companion Rack for assembly
7.5	2.387	1005	134	19.5	19.5	17.11								2.6	A70-7.51-100
7.5	2.387	1230	164	24.7	33	30.61	1200	13	18.5	9	15	9	0.057	7	A70-7.50-123
7.5	2.387														A50-7.51-999
															Companion Rack for assembly
10.0	3.183	1000	100	29.5	29.5	26.32								6.1	A70-101-100
10.0	3.183	1230	123	34.6	46.6	43.42	1200	13	28.6	11	18	11	0.055	13.9	A70-100-123
10.0	3.183														A50-101-999
															Companion Rack for assembly
12.5	3.979	1000	80	39.5	39.5	35.52								11	A70-12.51-100
12.5	3.979														A60-12.51-999
															Companion Rack for assembly

Material AISI 6150 (58CrMoV4) with holes and AISI 1045 (C45) without holes. Teeth are precision cut and racks are ground on all sides. Ends are machined for continuous mounting.

Fp is the max cumulative pitch error for the corresponding rack length.

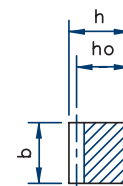
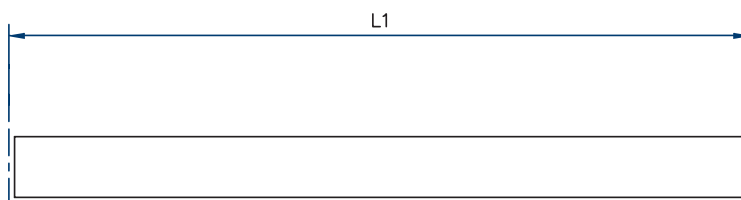
Dimensions are in mm and are subject to change - consult factory.

RACKS

WITH STRAIGHT (SPUR) TEETH

SERIES A80

Stainless Steel, Soft Rack
Tooth Quality DIN 8 h 27 (~AGMA 10)
20° Pressure Angle



Module	L1	teeth	b	h	ho	a	l	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part no.
1.0	499.51	159	10	9.80	8.80				Without Holes							0.34	A80-011-050
1.0	999.03	318	10	9.80	8.80				Without Holes							0.68	A80-011-100
1.0									Companion Rack for Assembly								A30-011-999
1.5	499.51	106	15	14.80	13.30				Without Holes							0.8	A80-1.51-050
1.5	999.03	212	15	14.80	13.30				Without Holes							1.6	A80-1.51-100
1.5									Companion Rack for assembly								A30-1.51-999
2.0	502.65	80	20	19.75	17.75				Without Holes							1.4	A80-021-050
2.0	999.03	159	20	19.75	17.75				Without Holes							2.8	A80-021-100
2.0	1998.05	318	20	19.75	17.75				Without Holes							5.6	A80-021-200
2.0									Companion Rack For Assembly								A10-021-999-W
3.0	499.51	53	30	29.75	26.75				Without Holes							3.1	A80-031-050
3.0	999.03	106	30	29.75	26.75				Without Holes							6.2	A80-031-100
3.0	1998.05	212	30	29.75	26.75				Without Holes							12.4	A80-031-200
3.0									Companion Rack for Assembly								A10-031-999-W
4.0	1005.31	80	40	39.70	35.70				Without Holes							11	A80-041-100
4.0	1998.05	159	40	39.70	35.70				Without Holes							22	A80-041-200
4.0									Companion Rack for Assembly								A10-041-999-W

Material AISI 303 (X8CrNiS 18-9). Rack ends are machined for continuous mounting.

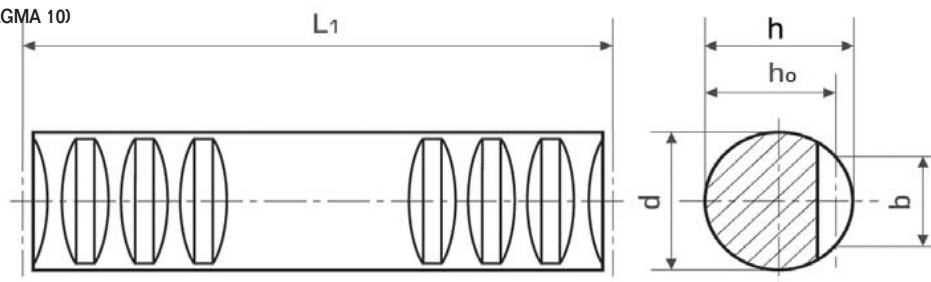
Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

MODULAR RACK & PINION SYSTEM

SERIES A90

Alloy Steel
Tooth Quality 8h27 (~AGMA 10)
20° Pressure Angle



Module	L1	teeth	d _{h6}	b	h	ho	Fp	mass kg.	Part no.
1.0	499.51	159	10	6.0	10	9.0	.056	0.66	A90-011-050
1.0	999.02	318	10	6.0	10	9.0	.063	1.3	A90-011-100
1.5	499.51	106	15	9.0	15	13.5	.056	0.84	A90-1.51-050
1.5	999.02	212	15	9.0	15	13.5	.063	1.7	A90-1.51-100
2.0	502.65	80	20	12.0	20	18.0	.056	1.1	A90-021-050
2.0	999.02	159	20	12.0	20	18.0	.063	2.2	A90-021-100
3.0	499.51	53	30	18.0	30	27	.063	2.5	A90-031-050
3.0	999.02	106	30	18.0	30	27	.071	5.1	A90-031-100
3.0	1998.05	212	30	18.0	30	27		10.2	A90-031-200
4.0	502.65	40	40	24.0	40	36.0	.071	4.5	A90-041-050
4.0	1005.30	80	40	24.0	40	36.0	.080	9.1	A90-041-100
4.0	2010.62	160	40	24.0	40	36.0		18.2	A90-041-100

Material ETG 100 is a high quality alloy steel with tensile strength = 1000 N/mm² (145,000 PSI)

The outside diameter is ground to tolerance h6 and rack ends are machined for continuous mounting

Fp is the cumulative pitch error for the corresponding rack length

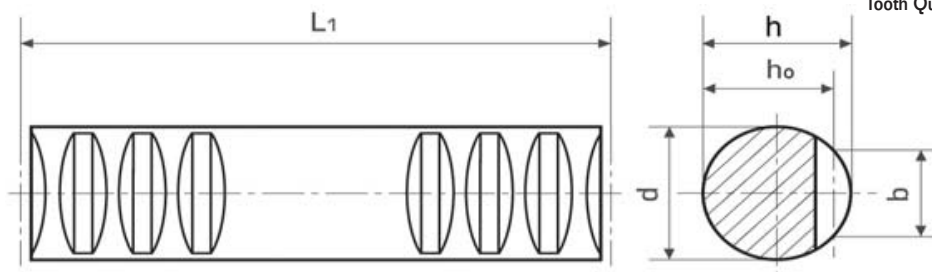
Please see support bushings on Page 21

Dimensions are in mm and are subject to change - consult factory

ROUND RACKS WITH STRAIGHT (SPUR) TEETH

SERIES A92

Stainless Steel
Tooth Quality 8h27 (~AGMA 10)
20° Pressure Angle



Module	L1	teeth	d_{hg}	b	h	ho	Fp	mass kg.	Part no.
1.0	499.51	159	10	6.2	10	9.0	.056	0.66	A92-011-050
1.0	999.02	318	10	6.2	10	9.0	.063	1.3	A92-011-100
1.5	499.51	106	15	9.3	15	13.5	.056	0.84	A92-1.51-050
1.5	999.02	212	15	9.3	15	13.5	.063	1.7	A92-1.51-100
2.0	502.65	80	20	12.5	20	18.0	.056	1.1	A92-021-050
2.0	999.02	159	20	12.5	20	18.0	.063	2.2	A92-021-100
3.0	499.51	53	30	18.5	30	27	.063	2.5	A92-031-050
3.0	999.02	106	30	18.5	30	27	.071	5.1	A92-031-100

Material AISI 303 (X8CrNiS 18-9)

The outside diameter tolerance is h9 and rack ends are machined for continuous mounting

Fp is the cumulative pitch error for the corresponding rack length

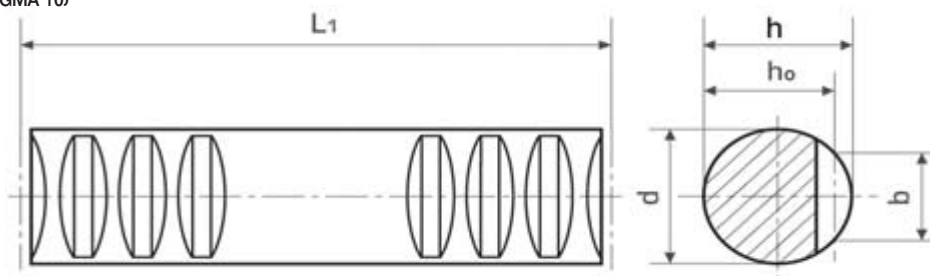
Please see support bushings on page 21

Dimensions are in mm and are subject to change - consult factory

MODULAR RACK & PINION SYSTEM

SERIES A94

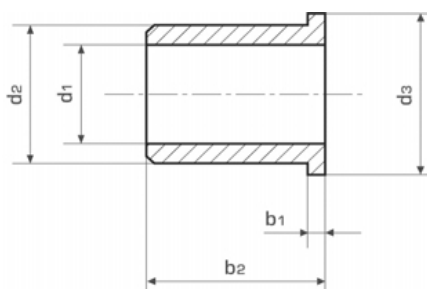
Soft
Tooth Quality 8h27 (~AGMA 10)
20° Pressure Angle



Module	L1	teeth	d_{h11}	b	h	ho	Fp	mass kg.	Part no.
1.0	499.51	159	15	7.5	15	14.0	.056	0.66	A94-011-050
1.0	999.02	318	15	7.5	15	14.0	.063	1.3	A94-011-100
1.5	499.51	106	17	9.6	17	15.5	.056	0.84	A94-1.51-050
1.5	999.02	212	17	9.6	17	15.5	.063	1.7	A94-1.51-100
2.0	502.65	80	20	12.0	20	18.0	.056	1.1	A94-021-050
2.0	999.02	159	20	12.0	20	18.0	.063	2.2	A94-021-100
2.5	502.65	64	25	15.0	25	22.5	.056	1.8	A94-2.51-050
2.5	997.45	127	25	15.0	25	22.5	.063	3.6	A94-2.51-100
3.0	499.51	53	30	18.0	30	27.0	.063	2.5	A94-031-050
3.0	999.02	106	30	18.0	30	27.0	.071	5.1	A94-031-100
4.0	502.65	40	40	24.0	40	36.0	.071	4.5	A94-041-050
4.0	1005.30	80	40	24.0	40	36.0	.080	9.1	A94-041-100
5.0	502.65	32	50	30.0	50	45.0	.071	7.1	A94-051-050
5.0	1005.30	64	50	30.0	50	45.0	.080	14.3	A94-051-100
5.0	2010.60	128	50	30.0	50	45.0		28.6	A94-051-200

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI)
The outside diameter tolerance h11 and rack ends are machined for continuous mounting
Fp is the cumulative pitch error for the corresponding rack length
See Support bushings below.

Oil Impregnated bronze bushings with MoS₂ providing nearly maintenance free round rack supports



SUPPORT BUSHINGS

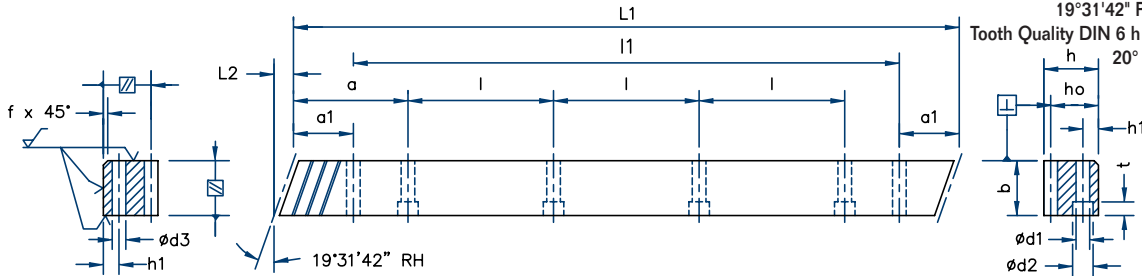
d1*	d2 r7	d3	b1	b2	(kg)	Part no.
10	16	22	3	16	0.02	141-010-000
15	21	26	3	16	0.03	141-015-000
20	26	32	3	25	0.04	141-020-000
30	38	46	4	30	0.11	141-030-000
40	50	60	5	50	0.27	141-040-000
50	60	70	5	63	0.58	141-050-000

* For Ød1 = 10 - 40 mm - tolerance = E7; For Ød1 = 50 mm - tolerance E8
Dimensions are in mm and are subject to change - consult factory

RACKS WITH RH HELICAL TEETH

SERIES A11

Case Hardened & Ground Teeth
19°31'42" R.H. Helix Angle
Tooth Quality DIN 6 h 23 (~AGMA12)
20° Pressure Angle



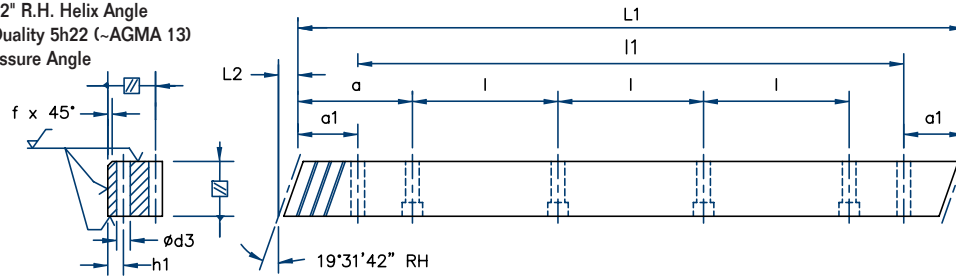
Module	L1	L2	teeth	b	h	ho	f	l1	a	l	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part no.
1.5	500	6.7	100	19	19	17.5	2	436.6	62.5	125	4	8	7	11	7	31.7	5.7	0.029	1.3	A11-1.50-050
1.5	500	6.7	100	19	19	17.5	2					Without Holes						0.029	1.3	A11-1.51-050
1.5	1000	6.7	200	19	19	17.5	2	936.6	62.5	125	8	8	7	11	7	31.7	5.7	0.043	2.6	A11-1.50-100
1.5	1000	6.7	200	19	19	17.5	2					Without Holes						0.043	2.6	A11-1.51-100
1.5								Companion Rack For Assembly												A11-1.51-999
2.0	500	8.5	75	24	24	22	2	436.6	62.5	125	4	8	7	11	7	31.7	5.7		2.1	A11-020-050
2.0	500	8.5	75	24	24	22	2					Without Holes							2.1	A11-021-050
2.0	1000	8.5	150	24	24	22	2	936.6	62.5	125	8	8	7	11	7	31.7	5.7	0.036	4.2	A11-020-100
2.0	1000	8.5	150	24	24	22	2					Without Holes						0.036	4.2	A11-021-100
2.0	2000	8.5	300	24	24	22	2	1936.6	62.5	125	16	8	7	11	7	31.7	5.7	0.058	8.2	A11-020-200
2.0	2000	8.5	300	24	24	22	2					Without Holes						0.058	8.2	A11-021-200
2.0								Companion Rack For Assembly												A11-021-999
2.5	500	8.5	60	24	24	21.5	2	436.6	62.5	125	4	9	7	11	7	31.7	5.7	0.027	2.0	A11-2.50-050
2.5	500	8.5	60	24	24	21.5	2					Without Holes						0.027	2.0	A11-2.51-050
2.5	1000	8.5	120	24	24	21.5	2	936.6	62.5	125	8	9	7	11	7	31.7	5.7	0.036	4.1	A11-2.50-100
2.5	1000	8.5	120	24	24	21.5	2					Without Holes						0.036	4.1	A11-2.51-100
2.5	2000	8.5	240	24	24	21.5	2	1936.6	62.5	125	16	9	7	11	7	31.7	5.7	0.053	8.2	A11-2.50-200
2.5	2000	8.5	240	24	24	21.5	2					Without Holes						0.053	8.2	A11-2.51-200
2.5								Companion Rack For Assembly												A11-2.51-999
3.0	500	10.3	50	29	29	26	2	430	62.5	125	4	9	10	15	9	35	7.7		2.9	A11-030-050
3.0	500	10.3	50	29	29	26	2					Without Holes							2.9	A11-031-050
3.0	1000	10.3	100	29	29	26	2	930	62.5	125	8	9	10	15	9	35	7.7	0.036	5.9	A11-030-100
3.0	1000	10.3	100	29	29	26	2					Without Holes						0.036	5.9	A11-031-100
3.0	2000	10.3	200	29	29	26	2	1930	62.5	125	16	9	10	15	9	35	7.7	0.054	11.2	A11-030-200
3.0	2000	10.3	200	29	29	26	2					Without Holes						0.054	11.2	A11-031-200
3.0								2												A11-031-999
4.0	506.67	13.8	38	39	39	35	3	433.0	62.5	125	4	12	10	15	9	33.3	7.7		5.4	A11-040-050
4.0	506.67	13.8	38	39	39	35	3					Without Holes							5.4	A11-041-050
4.0	1000	13.8	75	39	39	35	3	933.4	62.5	125	8	12	10	15	9	33.3	7.7	0.040	10.7	A11-040-100
4.0	1000	13.8	75	39	39	35	3					Without Holes						0.040	10.7	A11-041-100
4.0	2000	13.8	150	39	39	35	3	1933.4	62.5	125	16	12	10	15	9	33.3	7.7		21.4	A11-040-200
4.0	2000	13.8	150	39	39	35	3					Without Holes							21.4	A11-041-200
4.0								Companion Rack for Assembly												A11-041-999
5.0	500	17.4	30	49	49	34	3	425	62.5	125	4	12	14	20	13	37.5	11.7		6.5	A11-050-050
5.0	500	17.4	30	49	49	34	3					Without Holes							6.5	A11-051-050
5.0	1000	17.4	60	49	49	34	3	925	62.5	125	8	12	14	20	13	37.5	11.7	0.040	13	A11-050-100
5.0	1000	17.4	60	49	49	34	3					Without Holes						0.040	13	A11-051-100
5.0	2000	17.4	120	49	49	34	3	1925	62.5	125	16	12	14	20	13	37.5	11.7		26	A11-050-200
5.0	2000	17.4	120	49	49	34	3					Without Holes							26	A11-051-200
5.0								Companion Rack for Assembly												A11-051-999
6.0	500	20.9	25	59	59	43	3	425	62.5	125	4	16	18	26	17	37.5	15.7		9.9	A11-060-050
6.0	500	20.9	25	59	59	43	3					Without Holes							9.9	A11-061-050
6.0	1000	20.9	50	59	59	43	3	925	62.5	125	8	16	18	26	17	37.5	15.7	0.040	19.8	A11-060-100
6.0	1000	20.9	50	59	59	43	3					Without Holes						0.040	19.8	A11-061-100
6.0	2000	20.9	100	59	59	43	3	1925	62.5	125	16	16	18	26	17	37.5	15.7		36.2	A11-060-200
6.0	2000	20.9	100	59	59	43	3					Without Holes							36.2	A11-061-200
6.0								Companion Rack for Assembly												A11-061-999
8.0	480	28	18	79	79	71	3	240	60.0	120	4	25	22	33	21	120.0	19.7		21	A11-080-050
8.0	480	28	18	79	79	71	3					Without Holes							21	A11-081-050
8.0	960	28	36	79	79	71	3	720	60.0	120	8	25	22	33	21	120.0	19.7	0.040	42.5	A11-080-100
8.0	960	28	36	79	79	71	3					Without Holes						0.040	42.5	A11-081-100
8.0	1920	28	72	79	79	71	3	1680	60.0	120	16	25	22	33	21	120	19.7		85	A11-080-200
8.0	1920	28	72	79	79	71	3					Without Holes							85	A11-081-200
8.0								Companion Rack for Assembly												A11-081-999
10.0	1000	35.11	30	99	99	89	3	750	62.5	125	8	32	33	48	32	125	19.7	0.040	69	A11-100-100
10.0	1000	35.11	30	99	99	89	3					Without Holes						0.040	69	A11-101-100
10.0								Companion Rack for Assembly												A11-101-999

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Teeth induction hardened to 50-55 Rc; ground on all sides after hardening. Only teeth are hardened allowing subsequent drilling and pinning of rack. Rack ends are machined for continuous mounting. Fp is the max cumulative pitch error for the corresponding rack length. Dimensions are in mm and are subject to change - consult factory.

MODULAR RACK & PINION SYSTEM

SERIES A11-Q5

Case Hardened & Ground Teeth
19°31'42" R.H. Helix Angle
Tooth Quality 5h22 (-AGMA 13)
20° Pressure Angle



RACKS WITH RH HELICAL TEETH

Module	L1	L2	teeth	b	h	ho	f	L1	a	l	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part no.
1.5	500	6.7	100	19	19	17.5	2	436.6	62.5	125	4	8	7	11	7	31.7	5.7	0.021	1.3	A11-1.50-050-Q5
1.5	1000	6.7	200	19	19	17.5	2	936.6	62.5	125	8	8	7	11	7	31.7	5.7	0.030	2.6	A11-1.50-100-Q5
1.5	Companion Rack For Assembly																			A11-1.51-999
2.0	500	8.5	75	24	24	22	2	436.6	62.5	125	4	8	7	11	7	31.7	5.7	0.018	2.1	A11-020-050-Q5
2.0	1000	8.5	150	24	24	22	2	936.6	62.5	125	8	8	7	11	7	31.7	5.7	0.025	4.2	A11-020-100-Q5
2.0	Companion Rack For Assembly																			A11-021-999
2.5	500	8.5	60	24	24	21.5	2	436.6	62.5	125	4	9	7	11	7	31.7	5.7	0.019	2.0	A11-2.50-050-Q5
2.5	1000	8.5	120	24	24	21.5	2	936.6	62.5	125	8	9	7	11	7	31.7	5.7	0.024	4.1	A11-2.50-100-Q5
2.5	Companion Rack For Assembly																			A11-2.51-999
3.0	500	10.3	50	29	29	26	2	430	62.5	125	4	9	10	15	9	35	7.7	0.020	3	A11-030-050-Q5
3.0	1000	10.3	100	29	29	26	2	930	62.5	125	8	9	10	15	9	35	7.7	0.026	68	A11-030-100-Q5
3.0	Companion Rack for Assembly																			A11-031-999
4.0	506.67	13.8	38	39	39	35	3	433	62.5	125	4	12	10	15	9	33.3	7.7	0.021	5.4	A11-040-050-Q5
4.0	1000	13.8	75	39	39	35	3	933.4	62.5	125	8	12	10	15	9	33.3	7.7	0.026	10.8	A11-040-100-Q5
4.0	Companion Rack for Assembly																			A11-041-999
5.0	500	17.4	30	49	39	34	3	425	62.5	125	4	12	14	20	13	37.5	11.7	0.020	6.5	A11-050-050-Q5
5.0	1000	17.4	60	49	39	34	3	925	62.5	125	8	12	14	20	13	37.5	11.7	0.024	13.1	A11-050-100-Q5
5.0	Companion Rack for Assembly																			A11-051-999
6.0	500	20.9	25	59	49	43	3	425	62.5	125	4	16	18	26	17	37.5	15.7	0.022	10.0	A11-060-050-Q5
6.0	1000	20.9	50	59	49	43	3	925	62.5	125	8	16	18	26	17	37.5	15.7	0.026	20.3	A11-060-100-Q5
6.0	Companion Rack for Assembly																			A11-061-999
8.0	480	28	18	79	79	71	3	240	60.0	120	4	25	22	33	21	120.0	19.7	0.021	22	A11-080-050-Q5
8.0	960	28	36	79	79	71	3	720	60.0	120	8	25	22	33	21	120.0	19.7	0.024	44.3	A11-080-100-Q5
8.0	Companion Rack for Assembly																			A11-081-999
10.0	500	35.1	15	99	99	89	3	250	62.5	125	4	32	33	48	32	125	19.7	0.020	34	A11-100-050-Q5
10.0	1000	35.11	30	99	99	89	3	750	62.5	125	8	32	33	48	32	125	19.7	0.023	68	A11-100-100-Q5
10.0	Companion Rack for Assembly																			A11-101-999

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Teeth induction hardened to 50-55 Rc; ground on all sides after hardening. Only teeth are hardened allowing subsequent drilling and pinning of rack. Rack ends are machined for continuous mounting.

Fp is the max cumulative pitch error for the corresponding rack length.

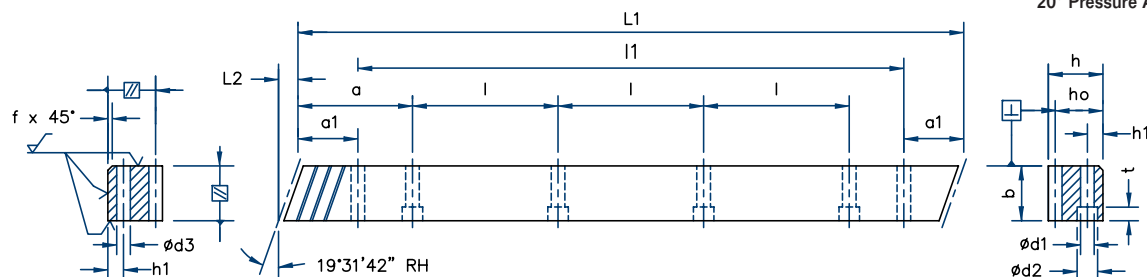
Dimensions are in mm and are subject to change - consult factory.

RACKS

WITH RH HELICAL TEETH

SERIES A13

Case Hardened & Ground Teeth
19°31'42" R.H. Helix Angle
Tooth Quality DIN 6 h 23 (~AGMA12)
20° Pressure Angle



Module	L1	L2	teeth	b	h	ho	f	l1	a	l	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part no.			
2.0	500	8.5	75	24	24	22	2	436.6	62.5	125	4	8	7	11	7	31.7	5.7		2.1	A13-020-050			
2.0	500	8.5	75	24	24	22	2	Without Holes													2.1	A13-021-050	
2.0	1000	8.5	150	24	24	22	2	936.6	62.5	125	8	8	7	11	7	31.7	5.7	0.036	4.2	A13-020-100			
2.0	1000	8.5	150	24	24	22	2	Without Holes													0.036	4.2	A13-021-100
2.0	Companion Rack For Assembly																				A11-021-999-W		
3.0	500	10.3	50	29	29	26	2	430	62.5	125	4	9	10	15	9	35	7.7		3	A13-030-050			
3.0	500	10.3	50	29	29	26	2	Without Holes													3	A13-031-050	
3.0	1000	10.3	100	29	29	26	2	930	62.5	125	8	9	10	15	9	35	7.7	0.036	6	A13-030-100			
3.0	1000	10.3	100	29	29	26	2	Without Holes													0.036	6	A13-031-100
3.0	Companion Rack for Assembly																				A11-031-999-W		
4.0	506.67	13.8	38	39	39	35	3	433	62.5	125	4	12	10	15	9	33.3	7.7		5.3	A13-040-050			
4.0	506.67	13.8	38	39	39	35	3	Without Holes													5.3	A13-041-050	
4.0	1000	13.8	75	39	39	35	3	933.4	62.5	125	8	12	10	15	9	33.3	7.7	0.040	10.6	A13-040-100			
4.0	1000	13.8	75	39	39	35	3	Without Holes													0.040	10.6	A13-041-100
4.0	Companion Rack for Assembly																				A11-041-999-W		

Material AISI 5115 (16MnCr5) Teeth induction hardened to 60 Rc: ground on all sides after hardening. Only teeth are hardened allowing subsequent drilling and pinning of rack. Rack ends are machined for continuous mounting.

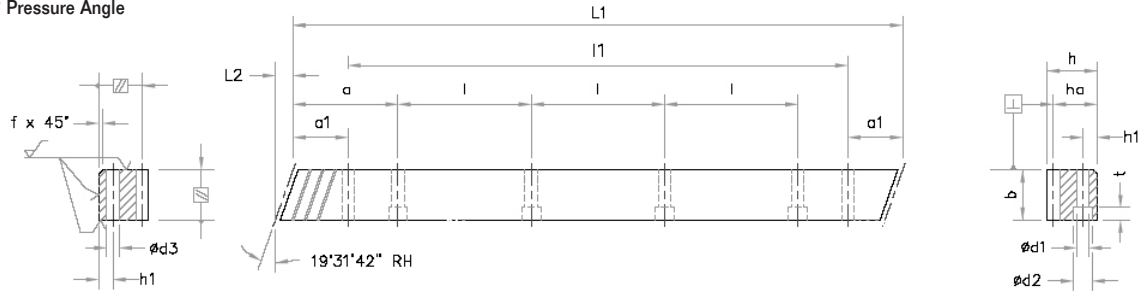
Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

SERIES A19 - HIGH STRENGTH RACKS

Case Hardened & Ground Teeth
 19°31'42" R.H. Helix Angle
 Tooth Quality DIN 6 h 23 (~AGMA12)
 20° Pressure Angle

RACKS
 WITH RH HELICAL TEETH



**PLEASE CONTACT ANDANTEX FOR DIMENSIONS
 AND RATINGS OF THIS NEW PRODUCT**

Material AISI 5115 (16MnCr5) Teeth flanks and root carburized and induction hardened to 60 Rc: ground on all sides after hardeneing.

Only teeth are hardened allowing subsequent drilling and pinning of rack. Rack ends are machined for continuous mounting.

Fp is the max cumulatve pitch error for the corresponding rack length.

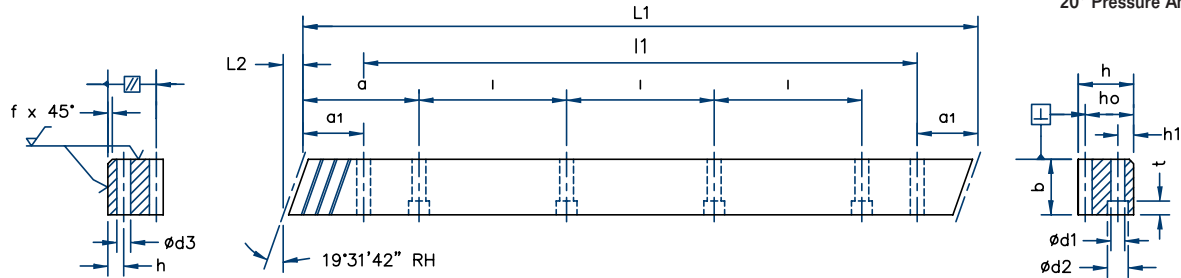
Dimensions are in mm and are subject to change - consult factory.

RACKS

WITH RH HELICAL TEETH

SERIES A21

Quenched & Tempered Material
19°31'42" R.H. Helix Angle
Tooth Quality DIN 8 h 27 (~AGMA10)
20° Pressure Angle



Module	L1	L2	teeth	b	h	ho	f	L	a	L	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part no.
2.0	500	8.5	75	24	24	22	2	436.6	62.5	125	4	8	7	11	7	31.7	5.7	2.1		A21-020-050
2.0	500	8.5	75	24	24	22	2					without holes						2.1		A21-021-050
2.0	1000	8.5	150	24	24	22	2	936.6	62.5	125	8	8	7	11	7	31.7	5.7	0.063	4.2	A21-020-100
2.0	1000	8.5	150	24	24	22	2					without holes						0.063	4.2	A21-021-100
2.0	2000	8.5	300	24	24	22	2	1936.6	62.5	125	16	8	7	11	7	31.7	5.7		8.6	A21-020-200
2.0	2000	8.5	300	24	24	22	2					without holes							8.6	A21-021-200
2.0								Companion Rack For Assembly												A11-021-999-W
3.0	500	10.3	50	29	29	26	2	430	62.5	125	4	9	10	15	9	35	7.7	3		A21-030-050
3.0	500	10.3	50	29	29	26	2					without holes						3		A21-031-050
3.0	1000	10.3	100	29	29	26	2	930	62.5	125	8	9	10	15	9	35	7.7	0.071	6	A21-030-100
3.0	1000	10.3	100	29	29	26	2					without holes						0.071	6	A21-031-100
3.0	2000	10.3	200	29	29	26	2	1930	62.5	125	16	9	10	15	9	35	7.7		12.2	A21-030-200
3.0	2000	10.3	200	29	29	26	2					without holes							12.2	A21-031-200
3.0								Companion Rack for Assembly												A11-031-999-W
4.0	506.67	13.8	38	39	39	35	2	433	62.5	125	4	12	10	15	9	33.3	7.7	5.5		A21-040-050
4.0	506.67	13.8	38	39	39	35	2					without holes						5.5		A21-041-050
4.0	1000	13.8	75	39	39	35	2	933.4	62.5	125	8	12	10	15	9	33.3	7.7	0.080	10.9	A21-040-100
4.0	1000	13.8	75	39	39	35	2					without holes						0.080	10.9	A21-041-100
4.0	2000	13.8	150	39	39	35	2	1933.4	62.5	125	16	12	10	15	9	33.3	7.7		21.8	A21-040-200
4.0	2000	13.8	150	39	39	35	2					without holes							21.8	A21-041-200
4.0								Companion Rack for Assembly												A11-041-999-W
5.0	500	17.4	30	49	39	34	2	425	62.5	125	4	12	14	20	13	37.5	11.7	6.5		A21-050-050
5.0	500	17.4	30	49	39	34	2					without holes						6.5		A21-051-050
5.0	1000	17.4	60	49	39	34	2	925	62.5	125	8	12	14	20	13	37.5	11.7	0.080	13	A21-050-100
5.0	1000	17.4	60	49	39	34	2					without holes						0.080	13	A21-051-100
5.0	2000	17.4	120	49	39	34	2	1925	62.5	125	16	12	14	20	13	37.5	11.7		26	A21-050-200
5.0	2000	17.4	120	49	39	34	2					without holes							26	A21-051-200
5.0								Companion Rack for Assembly												A11-051-999-W

Material AISI 4140 (42CrMo4V) with tensile strength = 900 N/mm² (130,500 PSI).

Back and contact faces ground. Rack ends are machined for continuous mounting.

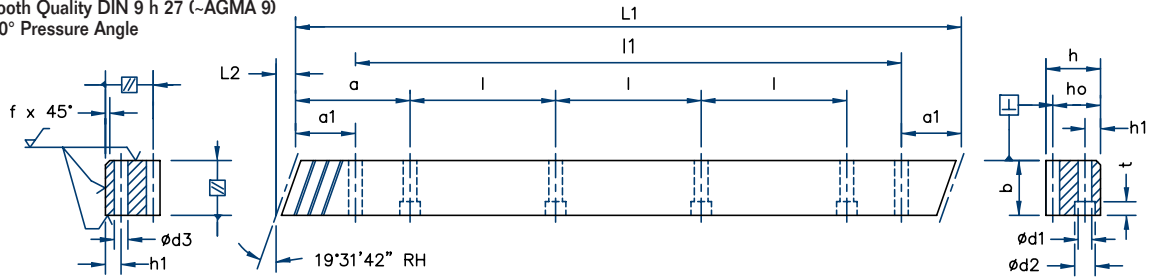
Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

MODULAR RACK & PINION SYSTEM

SERIES A31

Soft
19°31'42" R.H. Helix Angle
Tooth Quality DIN 9 h 27 (~AGMA 9)
20° Pressure Angle



RACKS WITH RH HELICAL TEETH

Module	L1	L2	teeth	b	h	ho	f	l1	a	l	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part no.
1.5	1000	6.0	200	17	16.80	15.30	1	936.6	62.5	125	8	6	6	10	6	31.7	5.7	0.090	2.0	A31-1.50-100
1.5	1000	6.0	200	17	16.80	15.30	1	Without Holes										0.090	2.0	A31-1.51-100
1.5	1500	6.0	300	17	16.80	15.30	1	1436.6	62.5	125	12	6	6	10	6	31.7	5.7		3.0	A31-1.50-150
1.5	1500	6.0	300	17	16.80	15.30	1	Without Holes											3.0	A31-1.51-150
1.5	2000	6.0	400	17	16.80	15.30	1	1936.6	62.5	125	16	6	6	10	6	31.7	5.7		4.0	A31-1.50-200
1.5	2000	6.0	400	17	16.80	15.30	1	Without Holes											4.0	A31-1.51-200
1.5	Companion Rack For Assembly																			A11-1.51-999
2.0	500	8.9	75	25	24.75	22.75	2	436.6	62.5	125	4	8	7	11	7	31.7	5.7		2.2	A31-020-050
2.0	500	8.9	75	25	24.75	22.75	2	Without Holes											2.2	A31-021-050
2.0	1000	8.9	150	25	24.75	22.75	2	936.6	62.5	125	8	8	7	11	7	31.7	5.7	0.090	4.4	A31-020-100
2.0	1000	8.9	150	25	24.75	22.75	2	Without Holes										0.090	4.4	A31-021-100
2.0	1500	8.9	225	25	24.75	22.75	2	1436.6	62.5	125	12	8	7	11	7	31.7	5.7		6.6	A31-020-150
2.0	1500	8.9	225	25	24.75	22.75	2	Without Holes											6.6	A31-021-150
2.0	2000	8.9	300	25	24.75	22.75	2	1936.6	62.5	125	16	8	7	11	7	31.7	5.7		8.8	A31-020-200
2.0	2000	8.9	300	25	24.75	22.75	2	Without Holes											8.8	A31-021-200
2.0	Companion Rack For Assembly																			A11-021-999-W
3.0	500	10.6	50	30	29.75	26.75	2	430	62.5	125	4	9	10	15	9	35	7.7		3.1	A31-030-050
3.0	500	10.6	50	30	29.75	26.75	2	Without Holes											3.1	A31-031-050
3.0	1000	10.6	100	30	29.75	26.75	2	930	62.5	125	8	9	10	15	9	35	7.7	0.100	6.2	A31-030-100
3.0	1000	10.6	100	30	29.75	26.75	2	Without Holes										0.100	6.2	A31-031-100
3.0	2000	10.6	200	30	29.75	26.75	2	1930	62.5	125	16	9	10	15	9	35	7.7		12.5	A31-030-200
3.0	2000	10.6	200	30	29.75	26.75	2	Without Holes											12.5	A31-031-200
3.0	Companion Rack for Assembly																			A11-031-999-W
4.0	506.67	14.2	38	40	39.7	35.7	3	433	62.5	125	4	12	10	15	9	33.3	7.7		5.6	A31-040-050
4.0	506.67	14.2	38	40	39.7	35.7	3	Without Holes											5.6	A31-041-050
4.0	1000	14.2	75	40	39.7	35.7	3	933.4	62.5	125	8	12	10	15	9	33.3	7.7	0.110	11.1	A31-040-100
4.0	1000	14.2	75	40	39.7	35.7	3	Without Holes										0.110	11.1	A31-041-100
4.0	2000	14.2	150	40	39.7	35.7	3	1933.4	62.5	125	16	12	10	15	9	33.3	7.7		22.2	A31-040-200
4.0	2000	14.2	150	40	39.7	35.7	3	Without Holes											22.2	A31-041-200
4.0	Companion Rack for Assembly																			A11-041-999-W
5.0	1000	17.7	60	50	39.7	34.7	3	925	62.5	125	8	12	14	20	13	37.5	11.7	0.110	13.2	A31-050-100
5.0	1000	17.7	60	50	39.7	34.7	3	Without Holes										0.110	13.2	A31-051-100
5.0	2000	17.7	120	50	39.7	34.7	3	1925	62.5	125	16	12	14	20	13	37.5	11.7		26.5	A31-050-200
5.0	2000	17.7	120	50	39.7	34.7	3	Without Holes											26.5	A31-051-200
5.0	Companion Rack for Assembly																			A11-051-999-W
6.0	1000	21.3	50	60	49.7	43.7	3	925	62.5	125	8	16	18	26	17	37.5	15.7	0.110	20.1	A31-060-100
6.0	1000	21.3	50	60	49.7	43.7	3	Without Holes										0.110	20.1	A31-061-100
6.0	2000	21.3	100	60	49.7	43.7	3	1925	62.5	125	16	16	18	26	17	37.5	15.7		40.2	A31-060-200
6.0	2000	21.3	100	60	49.7	43.7	3	Without Holes											40.2	A31-061-200
6.0	Companion Rack for Assembly																			A11-061-999-W
8.0	960	28.4	36	80	79.6	71.6	3	720	60.0	120	8	25	25	33	21	120.0	19.7	0.110	44.8	A31-080-100
8.0	960	28.4	36	80	79.6	71.6	3	Without Holes										0.110	44.8	A31-081-100
8.0	1920	28.4	72	80	79.6	71.6	3	1680	60.0	120	16	25	25	33	21	120	19.7		89.7	A31-080-200
8.0	1920	28.4	72	80	79.6	71.6	3	Without Holes											89.7	A31-081-200
8.0	Companion Rack for Assembly																			A11-081-999-W
10.0	1000	35.5	30	100	99	89	3	750	62.5	125	8	32	33	48	32	125	19.7		69.8	A31-100-100
10.0	1000	35.5	30	100	99	89	3	Without Holes											69.8	A31-101-100
10.0	Companion Rack for Assembly																			A11-101-999-W

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Rack ends are machined for continuous mounting.

Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

ANDANTEX

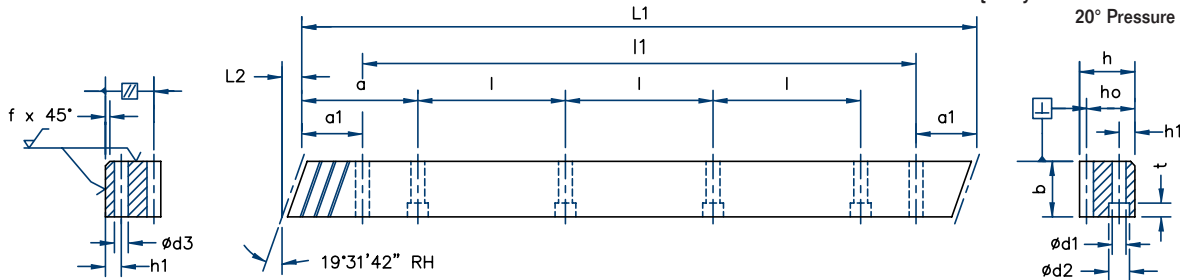
27

RACKS

WITH RH HELICAL TEETH

SERIES A41

Induction Hardened Teeth
19°31'42" R.H. Helix Angle
Quality DIN 10 h 27 (~AGMA 8)
20° Pressure Angle



Module	L1	L2	teeth	b	h	ho	f	l1	a	l	No. holes	h1	d1	d2	t	a1	d3	Fp	mass kg.	Part no.
2.0	500	8.5	75	24	24	22	2	436.6	62.5	125	4	8	7	11	7	31.7	5.7		2.1	A41-020-050
2.0	500	8.5	75	24	24	22	2												2.1	A41-021-050
2.0	1000	8.5	150	24	24	22	2	936.6	62.5	125	8	8	7	11	7	31.7	5.7	0.140	4.2	A41-020-100
2.0	1000	8.5	150	24	24	22	2											0.140	4.2	A41-021-100
2.0	2000	8.5	300	24	24	22	2	1936.6	62.5	125	16	8	7	11	7	31.7	5.7		8.4	A41-020-200
2.0	2000	8.5	300	24	24	22	2												8.4	A41-021-200
2.0								Companion Rack For Assembly												A11-021-999-W
3.0	500	10.3	50	29	29	26	2	430	62.5	125	4	9	10	15	9	35	7.7		3	A41-030-050
3.0	500	10.3	50	29	29	26	2												3	A41-031-050
3.0	1000	10.3	100	29	29	26	2	930.6	62.5	125	8	9	10	15	9	35	7.7	0.160	6	A41-030-100
3.0	1000	10.3	100	29	29	26	2											0.160	6	A41-031-100
3.0	2000	10.3	200	29	29	26	2	1930.6	62.5	125	16	9	10	15	9	35	7.7		12	A41-030-200
3.0	2000	10.3	200	29	29	26	2												12	A41-031-200
3.0								Companion Rack for Assembly												A11-031-999-W
4.0	506.67	13.8	38	39	39	35	3	433	62.5	125	4	12	10	15	9	33.3	7.7		5.3	A41-040-050
4.0	506.67	13.8	38	39	39	35	3												5.3	A41-041-050
4.0	1000	13.8	75	39	39	35	3	933.4	62.5	125	8	12	10	15	9	33.3	7.7	0.180	10.6	A41-040-100
4.0	1000	13.8	75	39	39	35	3											0.180	10.6	A41-041-100
4.0	2000	13.8	150	39	39	35	3	1933.4	62.5	125	16	12	10	15	9	33.3	7.7		21.2	A41-040-200
4.0	2000	13.8	150	39	39	35	3												21.2	A41-041-200
4.0								Companion Rack for Assembly												A11-041-999-W
5.0	500	17.4	30	49	49	34	3	425	62.5	125	4	12	14	20	13	37.5	11.7		6.5	A41-050-050
5.0	500	17.4	30	49	49	34	3												6.5	A41-051-050
5.0	1000	17.4	60	49	49	34	3	925	62.5	125	8	12	14	20	13	37.5	11.7	0.180	13	A41-050-100
5.0	1000	17.4	60	49	49	34	3											0.180	13	A41-051-100
5.0								Companion Rack for Assembly												A11-051-999-W
6.0	500	20.9	25	59	59	43	3	425	62.5	125	4	16	18	26	17	37.5	15.7		9.9	A41-060-050
6.0	500	20.9	25	59	59	43	3												9.9	A41-061-050
6.0	1000	20.9	50	59	59	43	3	925	62.5	125	8	16	18	26	17	37.5	15.7	0.180	19.8	A41-060-100
6.0	1000	20.9	50	59	59	43	3											0.180	19.8	A41-061-100
6.0								Companion Rack for Assembly												A11-061-999-W

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Teeth are induction hardened to 50-55Rc. Back and contact faces are machined after hardening. Only teeth are induction hardened allowing subsequent drilling and pinning of the rack. Rack ends are machined for continuous mounting.

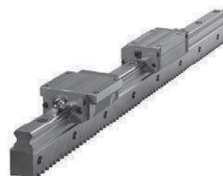
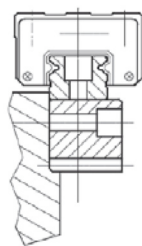
Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

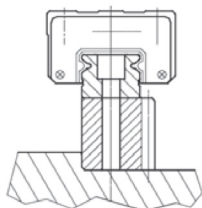
RACKS MACHINED FOR LINEAR GUIDEWAYS

Series	Style	Module	Heat Treatment	Quality Level*	Page
A52 _ _ _	Straight (spur) for rail 180°	5,10 circular pitch, p	Hardened & Ground	6 h 23 (~AGMA 12)	30
A54 _ _ _	Straight (spur) for rail 90°	5,10 circular pitch, p	Hardened & Ground	6 h 23 (~AGMA 12)	30
A72 _ _ _	Straight (spur) for rail 180°	5,10 circular pitch, p	Soft	9 h 27 (~AGMA 9)	31
A74 _ _ _	Straight (spur) for rail 90°	5,10 circular pitch, p	Soft	9 h 27 (~AGMA 9)	31
A15 _ _ _	Helical for Rail 180°	2, 3, 4	Hardened & Ground	6 h 23 (~AGMA 12)	32
A17 _ _ _	Helical for Rail 90°	2, 3, 4	Hardened & Ground	6 h 23 (~AGMA 12)	32
A33 _ _ _	Helical for Rail 180°	2, 3, 4	Soft	9 h 27 (~AGMA 9)	33
A35 _ _ _	Helical for Rail 90°	2, 3, 4	Soft	9 h 27 (~AGMA 9)	33

180° RACK GUIDEWAY DESIGN



90° RACK GUIDEWAY DESIGN



RACK, RAIL & BEARING BLOCK ASSEMBLY

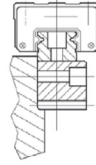
Series	Style	Module	Heat Treatment	Quality Level*	Page
Z2 _ _ _ R Z4 _ _ _ R	Straight (spur) for rail 180°	5,10 circular pitch, p	Hardened & Ground or Soft	6 h 23 (~AGMA 12) 9 h 27 (~AGMA 9)	34
Z2 _ _ _ Z Z4 _ _ _ Z	Straight (spur) for rail 90°	5,10 circular pitch, p	Hardened & Ground or Soft	6 h 23 (~AGMA 12) 9 h 27 (~AGMA 9)	35
Z1 _ _ _ R Z3 _ _ _ R	Helical with rail 180°	2, 3, 4	Hardened & Ground or Soft	6 h 23 (~AGMA 12) 9 h 27 (~AGMA 9)	36
Z1 _ _ _ Z Z3 _ _ _ Z	Helical with rail 90°	2, 3, 4	Hardened & Ground or Soft	6 h 23 (~AGMA 12) 9 h 27 (~AGMA 9)	37

*Note all AGMA quality grades in this catalog are based on AGMA standard 2000-A88. The new AGMA quality numbers defined in AGMA 2015-1-A01 are similar to the DIN numbers shown.

MODULAR RACK & PINION SYSTEM

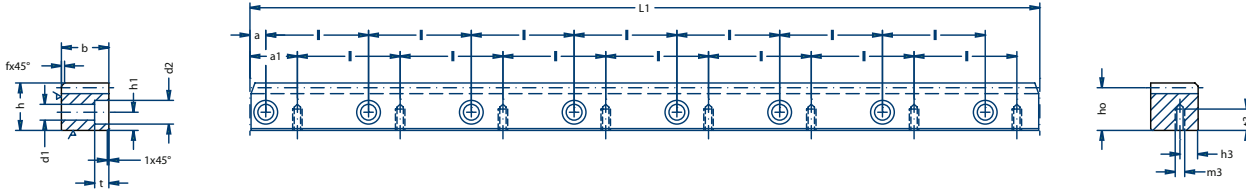
RACKS

WITH CIRCULAR PITCH STRAIGHT (SPUR) TEETH
MACHINED FOR LINEAR RAILS MOUNTED 180° FROM TOOTH SIDE



SERIES A52

Case Hardened & Ground Teeth
Tooth Quality DIN 6 h 23 (~AGMA12)
20° Pressure Angle

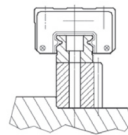


Circular Pitch, p	Module	L1	teeth	b	h	ho	f	a	l	holes	h1	d1	d2	t	a1	m3	h3	t3	Fp	kg.	Part no.
5.0	1.591	960	192	19	19.50	17.9	1	10	60	16	7.5	5.8	10	6	30	M4	7.5	8.0	0.032	2.7	A52-050-100
5.0	1.591	960	192	24	24.50	22.91	1	10	60	16	10.0	7.0	11	7	30	M5	10.0	11.0	0.032	4.2	A52-050-100-24
5.0	1.591																				A52-051-999
10.0	3.183	960	96	29	29.75	26.57	2	10	60	16	11.5	10.0	15	9	30	M6	11.5	13.5	0.038	5.6	A52-100-100
10.0	3.183																				A52-101-999

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Teeth induction hardened to 50-55 Rc; ground on all sides after hardening. Only teeth are hardened allowing subsequent drilling and pinning of rack. Rack ends are machined for continuous mounting.
Fp is the max cumulative pitch error for the corresponding rack length.
Dimensions are in mm and are subject to change - consult factory.

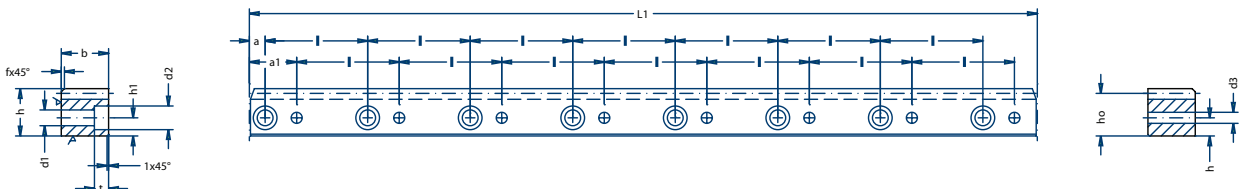
RACKS

WITH CIRCULAR PITCH STRAIGHT (SPUR) TEETH
MACHINED FOR LINEAR RAILS MOUNTED 90° FROM TOOTH SIDE



SERIES A54

Case Hardened & Ground Teeth
Tooth Quality DIN 6 h 23 (~AGMA12)
20° Pressure Angle



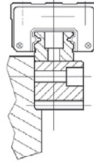
Circular Pitch, p	Module	L1	teeth	b	h	ho	f	a	l	holes	h1	d1	d2	t	a1	d3	Fp	kg.	Part no.
5.0	1.591	960	192	19	19.50	17.91	1	10	60	16	7.5	4.5	7.5	5.3	30	4.5		2.7	A54-050-100
5.0	1.591	960	192	24	24.50	22.91	1	10	60	16	10.0	6.0	9.5	8.5	30	6.0		4.2	A54-050-100-24
5.0	1.591	Companion Rack for Assembly																	A52-051-999
10.0	3.183	960	96	29	29.75	26.57	2	10	60	16	11.5	7.0	11.0	9.0	30	7.0		5.6	A54-100-100
10.0	3.183	Companion Rack for Assembly																	A52-101-999

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Teeth induction hardened to 50-55 Rc; ground on all sides after hardening. Only teeth are hardened allowing subsequent drilling and pinning of rack. Rack ends are machined for continuous mounting.
Fp is the max cumulative pitch error for the corresponding rack length.
Dimensions are in mm and are subject to change - consult factory.

MODULAR RACK & PINION SYSTEM

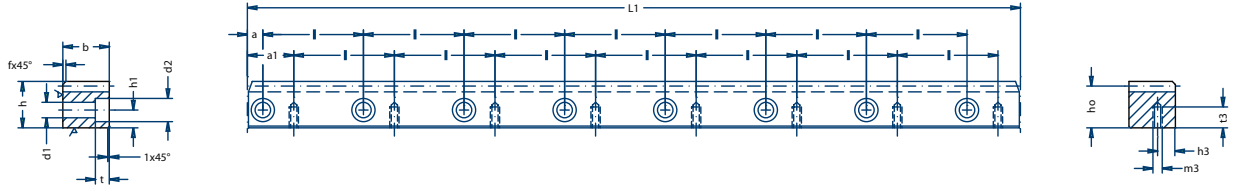
SERIES A72

Soft Teeth
Tooth Quality DIN 9 h 27 (~AGMA 9)
20° Pressure Angle



RACKS

WITH CIRCULAR PITCH STRAIGHT (SPUR) TEETH
MACHINED FOR LINEAR RAILS MOUNTED 180° FROM TOOTH SIDE



Circular Pitch, p	Module	L1	teeth	b	h	ho	f	a	l	holes	h1	d1	d2	t	a1	m3	h3	t3	Fp	kg.	Part no.
5.0	1.591	1920	384	20	19.50	17.91	1	10	60	32	7.5	5.8	10	6	30	M4	7.5	8.0	5.4		A72-050-200
5.0	1.591	1920	384	25	24.50	22.91	1	10	60	32	10.0	7.0	11	7	30	M5	10.0	11.0	8.4		A72-050-200-25
5.0	1.591																				A52-051-999
10.0	3.183	1920	192	30	29.75	26.57	2	10	60	32	11.5	10.0	15	9	30	M6	11.5	13.5	11.2		A72-100-200
10.0	3.183																				A52-101-999

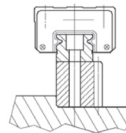
Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Rack ends are machined for continuous mounting.

Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

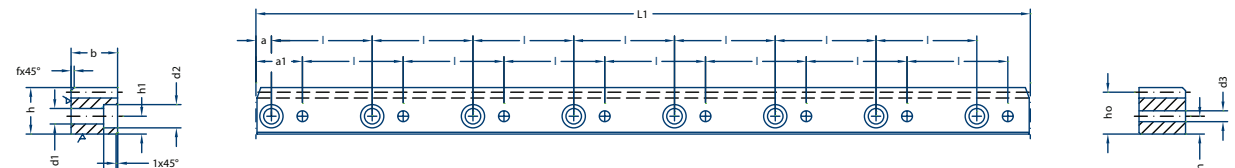
SERIES A74

Soft Teeth
Tooth Quality DIN 9 h 27 (~AGMA 9)
20° Pressure Angle



RACKS

WITH CIRCULAR PITCH STRAIGHT (SPUR) TEETH
MACHINED FOR LINEAR RAILS MOUNTED 90° FROM TOOTH SIDE



Circular										Case Hardened & Ground Teeth									
Pitch, p	Module	L1	teeth	b	h	ho	f	a	l	holes	h1	d1	d2	t	a1	d3	Fp	kg.	Part no.
5.0	1.591	1920	384	20	19.50	17.91	1	10	60	32	7.5	4.5	7.5	5.3	30	4.5		5.4	A74-050-200
5.0	1.591	1920	384	25	24.50	22.91	1	10	60	32	10.0	6.0	9.5	8.5	30	6.0		8.4	A74-050-200-25
5.0	1.591																		A52-051-999
10.0	3.183	1920	192	30	29.75	26.57	2	10	60	32	11.5	7.0	11.0	9.0	30	7.0		11.2	A74-100-200
10.0	3.183																		A52-101-999

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Rack ends are machined for continuous mounting.

Fp is the max cumulative pitch error for the corresponding rack length.

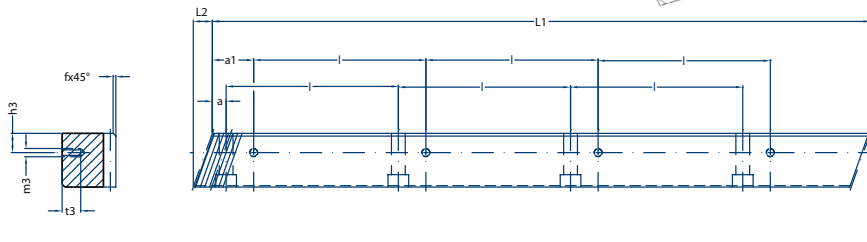
Dimensions are in mm and are subject to change - consult factory.

MODULAR RACK & PINION SYSTEM

RACKS

WITH RH HELICAL TEETH

MACHINED FOR LINEAR RAILS MOUNTED 180° FROM TOOTH SIDE



SERIES A15

Case Hardened & Ground Teeth
19°31'42" R.H. Helix Angle
Tooth Quality DIN 6 h 23 (~AGMA12)
20° Pressure Angle

Module	L1	L2	teeth	b	h	ho	f	a	l	holes	h1	d1	d2	t	a1	m3	h3	t3	Fp	mass kg.	Part no.
2.0	960	6.70	144	19	19.50	17.50	1	10	60	16	7.5	5.8	10.0	6	30	M4	7.5	8.0	0.036	2.7	A15-020-100
2.0	960	8.50	144	24	24.50	22.50	1	10	60	16	10.0	7.0	11.0	7	30	M5	10.0	11.0	0.036	4.2	A15-020-100-24
Companion Rack for Assembly																					A11-021-999-W
3.0	960	10.30	96	29	29.75	26.75	2	10	60	16	11.5	10	15.0	9	30	M6	11.5	13.5	0.036	5.6	A15-030-100
3.0	Companion Rack for Assembly																				A11-031-999-W
4.0	960	13.83	72	39	39.75	35.75	2	20	80	12	14.0	12.0	18.0	12	40	M8	14.0	16.0	0.040	10.5	A15-040-100
4.0	960	13.83	72	39	48.75	44.75	2	20	80	12	17.0	12.0	18.0	12	40	M8	17.0	16.0	0.040	13	A15-040-100-1
4.0	840	17.38	63	49	58.00	54.00	2	30	105	8	22.5	14.0	20.0	13	60	M12	22.5	25.0	0.040	17.3	A15-040-100-49
4.0	Companion Rack for Assembly																				A11-041-999-W

Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Teeth induction hardened to 50-55 Rc; ground on all sides after hardening. Only teeth are hardened allowing subsequent drilling and pinning of rack. Rack ends are machined for continuous mounting.

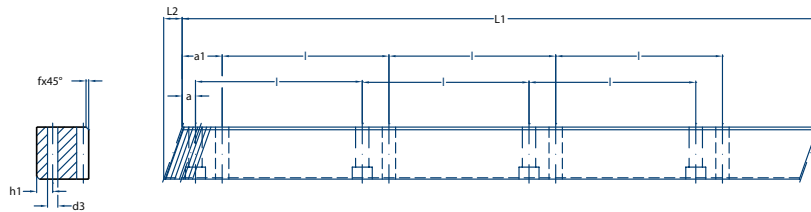
Fp is the max cumulative pitch error for the corresponding rack length.

Dimensions are in mm and are subject to change - consult factory.

RACKS

WITH RH HELICAL TEETH

MACHINED FOR LINEAR RAILS MOUNTED 90° FROM TOOTH SIDE



SERIES A17

Case Hardened & Ground Teeth
19°31'42" R.H. Helix Angle
Tooth Quality DIN 6 h 23 (~AGMA12)
20° Pressure Angle

Module	L1	L2	teeth	b	h	ho	f	a	l	holes	h1	d1	d2	t	a1	d3	Fp	kg.	Part no.
2.0	480	6.70	72	19	19.50	17.50	1	10	60	8	7.5	4.5	7.5	5.3	30	4.5		1.3	A17-020-050
2.0	960	6.70	144	19	19.50	17.50	1	10	60	16	7.5	4.5	7.5	5.3	30	4.5	0.036	2.7	A17-020-100
2.0	480	8.50	72	24	24.50	22.50	1	10	60	8	10.0	6.0	9.5	8.5	30	6.0		2.1	A17-020-050-24
2.0	960	8.50	144	24	24.50	22.50	1	10	60	16	10.0	6.0	9.5	8.5	30	6.0	0.036	4.2	A17-020-100-24
2.0	Companion Rack for Assembly																		A11-021-999-W
3.0	480	10.30	48	29	29.75	26.75	2	10	60	8	11.5	7.0	11.0	9.0	30	7.0		2.8	A17-030-050
3.0	960	10.30	96	29	29.75	26.75	2	10	60	16	11.5	7.0	11.0	9.0	30	7.0	0.036	5.6	A17-030-100
3.0	Companion Rack for Assembly																		A11-031-999-W
4.0	480	13.83	36	39	39.75	35.75	2	20	80	6	14.0	10.0	15.0	9.0	40	10.0		5.2	A17-040-050
4.0	960	13.83	72	39	39.75	35.75	2	20	80	12	14.0	10.0	15.0	9.0	40	10.0	0.040	10.5	A17-040-100
4.0	480	13.83	36	39	48.75	44.75	2	20	80	6	17.0	10.0	15.0	9.0	40	10.0		6.5	A17-040-050-1
4.0	960	13.83	72	39	48.75	44.75	2	20	80	12	17.0	10.0	15.0	9.0	40	10.0	0.040	13	A17-040-100-1
4.0	840	17.38	63	49	58.00	54.00	2	30	105	8	22.5	14.0	20.0	13.0	60	14.0		17.3	A17-040-100-49
4.0	Companion Rack for Assembly																		A11-041-999-W

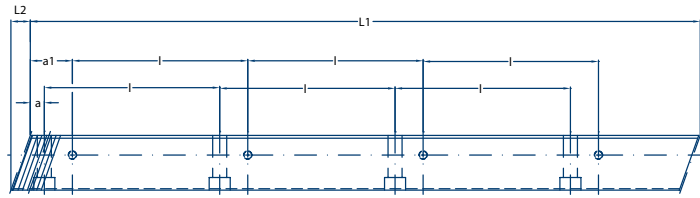
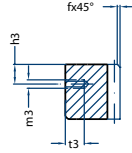
Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Teeth induction hardened to 50-55 Rc; ground on all sides after hardening. Only teeth are hardened allowing subsequent drilling and pinning of rack. Rack ends are machined for continuous mounting.

Fp is the max cumulative pitch error for the corresponding rack length. Dimensions are in mm and are subject to change - consult factory.

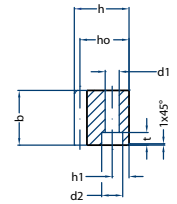
MODULAR RACK & PINION SYSTEM

SERIES A33

Soft Teeth
Tooth Quality DIN 9 h 27 (-AGMA 9)
19°31'42" R.H. Helix Angle
20° Pressure Angle



RACKS
WITH RH HELICAL TEETH
MACHINED FOR LINEAR RAILS MOUNTED 180° FROM TOOTH SIDE



Module	L1	L2	teeth	b	h	ho	f	a	l	holes	h1	d1	d2	t	a1	m3	h3	t3	Fp	kg.	Part no.
2.0	1920	7.1	288	20	19.5	17.5	1	10	60	32	7.5	5.8	10	6	30	M4	7.5	8	5.4		A33-020-200
2.0	1920	8.9	288	25	24.5	22.5	1	10	60	32	10	7	11	7	30	M5	10	11	8.4		A33-020-200-25
2.0																					A11-021-999-W
3.0	1920	10.6	192	30	29.75	26.75	2	10	60	32	11.5	10	15	9	30	M6	11.5	13.5	11.2		A33-030-200
3.0																					A11-031-999-W
4.0	1920	14.2	144	40	39.75	35.75	2	20	80	24	14	12	18	12	40	M8	14	16	21.5		A33-040-200
4.0																					A11-041-999-W

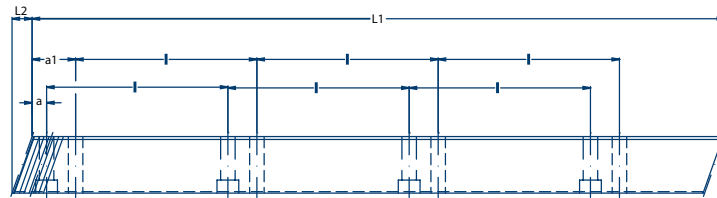
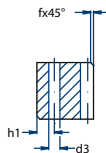
Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Rack ends are machined for continuous mounting.

Fp is the max cumulative pitch error for the corresponding rack length.

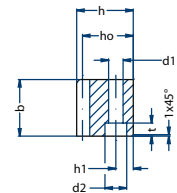
Dimensions are in mm and are subject to change - consult factory.

SERIES A35

Soft Teeth
Tooth Quality DIN 9 h 27 (-AGMA 9)
19°31'42" R.H. Helix Angle
20° Pressure Angle



RACKS
WITH RH HELICAL TEETH
CHINED FOR LINEAR RAILS MOUNTED 90° FROM TOOTH SIDE



Module	L1	L2	teeth	b	h	ho	f	a	l	holes	h1	d1	d2	t	a1	d3	Fp	kg.	Part no.	
2.0	1920	7.1	288	20	19.5	17.5	1	10	60	32	7.5	4.5	7.5	5.3	30	4.5	5.4		A35-020-200	
2.0	1920	8.9	288	25	24.5	22.5	1	10	60	32	10	6	9.5	8.5	30	6	8.4		A35-020-200-25	
2.0								Companion Rack for Assembly												A11-021-999-W
3.0	1920	10.6	192	30	29.75	26.75	2	10	60	32	11.5	7	11	9	30	7	11.2		A35-030-200	
3.0								Companion Rack for Assembly												A11-031-999-W
4.0	1920	14.2	144	40	39.75	35.75	2	20	80	24	14	10	15	9	40	10	21.5		A35-040-200	
4.0								Companion Rack for Assembly												A11-041-999-W

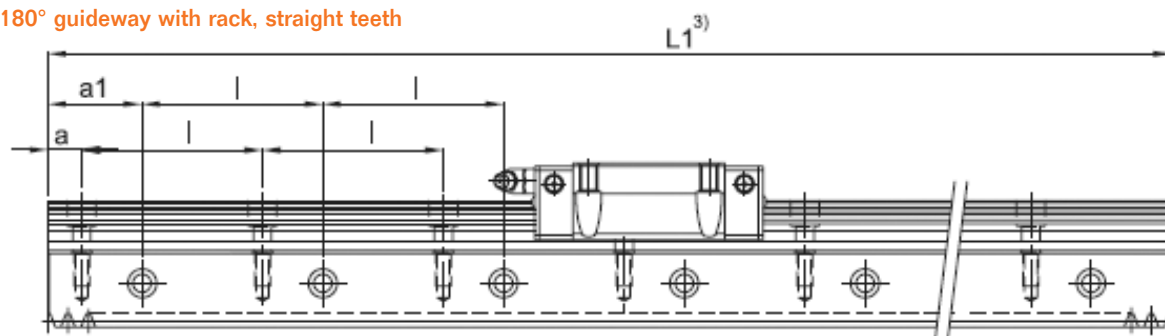
Material AISI 1045 (C45) with tensile strength = 650 N/mm² (95,000 PSI). Rack ends are machined for continuous mounting.

Fp is the max cumulative pitch error for the corresponding rack length.

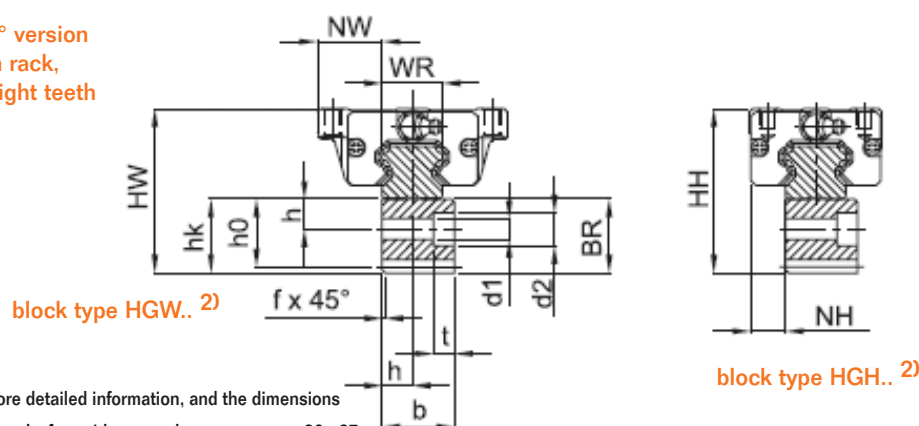
Dimensions are in mm and are subject to change - consult factory.

LINEAR GUIDEWAY WITH RACK Z SERIES

180° guideway with rack, straight teeth



180° version
with rack,
straight teeth



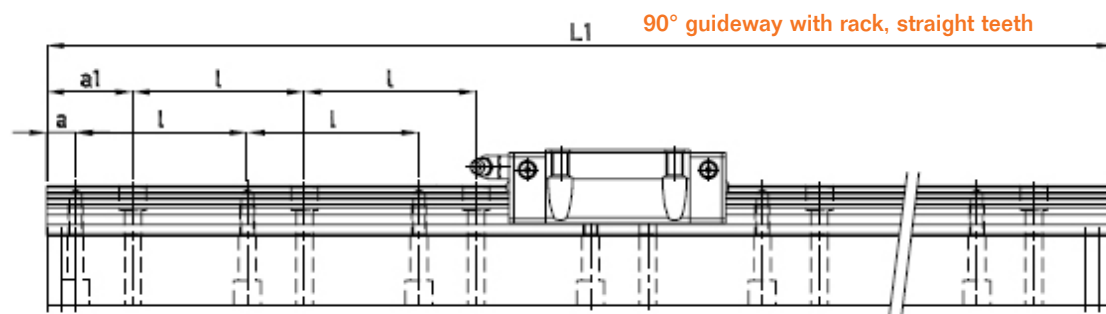
For more detailed information, and the dimensions
of our racks for guideways, please see pages 26 - 27.

Part no.	tooth quality 1)	design	GT f/300 4)	pitch	L1 ³⁾	b	hk	h0	f	a	a1	rack
Z2HGR15R	2	180°	0.022	p = 5	960	19	19.50	17.91	1	10	30	A52-050-100
Z4HGR15R	4	180°	0.059	p = 5	1920	20	19.50	17.91	1	10	30	A72-050-200
Z2HGR20R	2	180°	0.022	p = 5	960	24	24.50	22.91	1	10	30	A52-050-100-24
Z4HGR20R	4	180°	0.059	p = 5	1920	25	24.50	22.91	1	10	30	A72-050-200-25
Z2HGR25R	2	180°	0.024	p = 10	960	29	29.75	26.57	2	10	30	A52-100-100
Z4HGR25R	4	180°	0.065	p = 10	1920	30	29.75	26.57	2	10	30	A72-100-200

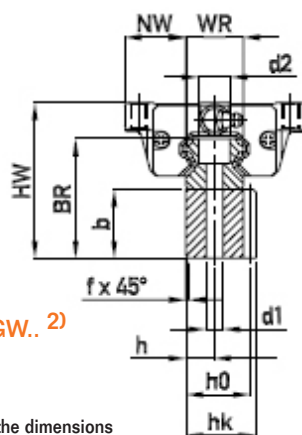
Part no.	l	h	d1	d2	t	BR	WR	NW	HW	NH	HH
Z2HGR15R	60	7.5	5.8	10	6	34.50	15	16.0	43.50	9.5	47.50
Z4HGR15R	60	7.5	5.8	10	6	34.50	15	16.0	43.50	9.5	47.50
Z2HGR20R	60	10.0	7.0	11	7	42.00	20	21.5	54.50	12.0	54.50
Z4HGR20R	60	10.0	7.0	11	7	42.00	20	21.5	54.50	12.0	54.50
Z2HGR25R	60	11.5	10.0	15	9	51.75	23	23.5	65.75	12.5	69.75
Z4HGR25R	60	11.5	10.0	15	9	51.75	23	23.5	65.75	12.5	69.75

- 1) 1 = helical, ground, hardened (6h23)
2 = straight teeth, ground, hardened (6h23)
3 = helical, milled, soft (9h27)
4 = straight teeth, milled, soft (9h27)
- 2) design and dimensions of the blocks acc. to HG series
- 3) racks with great length are delivered in several parts. To bring them into the correct pitch position, a mounting piece can be delivered.
- 4) maximum pitch error of the rack; rack length 300 mm.

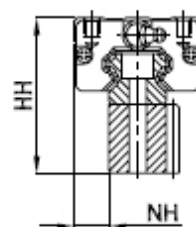
LINEAR GUIDEWAY WITH RACK Z SERIES



90° version,
straight teeth



block type HGW.. 2)



block type HGH.. 2)

For more detailed information, and the dimensions
of our racks for guideways, please see pages 26 - 27.

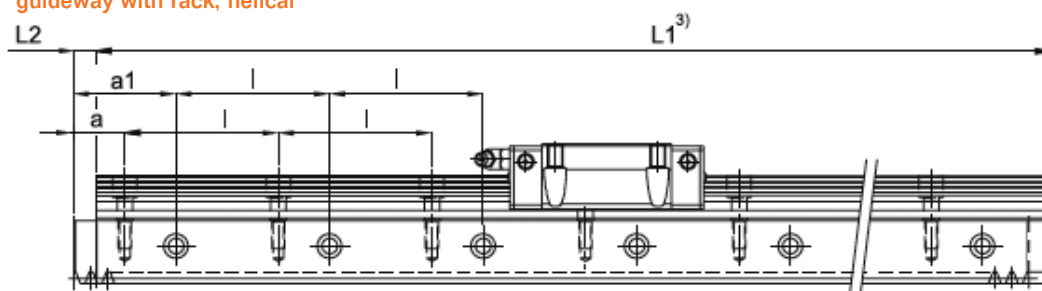
Part no.	toothing quality 1)	design	GT f/300 4)	pitch	L1 3)	b	hk	h0	f	a	a1	rack
Z2HGR15Z	2	90°	0.022	p = 5	960	19	19.50	17.91	1	10	30	A54-050-100
Z4HGR15Z	4	90°	0.059	p = 5	1920	20	19.50	17.91	1	10	30	A74-050-200
Z2HGR20Z	2	90°	0.022	p = 5	960	24	24.50	22.91	1	10	30	A54-050-100-24
Z4HGR20Z	4	90°	0.059	p = 5	1920	25	24.50	22.91	1	10	30	A74-050-200-25
Z2HGR25Z	2	90°	0.024	p = 10	960	29	29.75	26.57	2	10	30	A54-100-100
Z4HGR25Z	4	180°	0.065	p = 10	1920	30	29.75	26.57	2	10	30	A74-100-200

Part no.	l	h	d1	d2	t	BR	WR	NW	HW	NH	HH
Z2HGR15Z	60	7.5	4.5	7.5	5.3	34.0	15	16.0	43	9.5	47
Z4HGR15Z	60	7.5	4.5	7.5	5.3	35.0	15	16.0	44	9.5	48
Z2HGR20Z	60	10.0	6.0	9.5	8.5	41.5	20	21.5	54	12.0	54
Z4HGR20Z	60	10.0	6.0	9.5	8.5	42.5	20	21.5	55	12.0	55
Z2HGR25Z	60	11.5	7.0	11.0	9.0	51.0	23	23.5	65	12.5	69
Z4HGR25Z	60	11.5	7.0	11.0	9.0	52.0	23	23.5	66	12.5	70

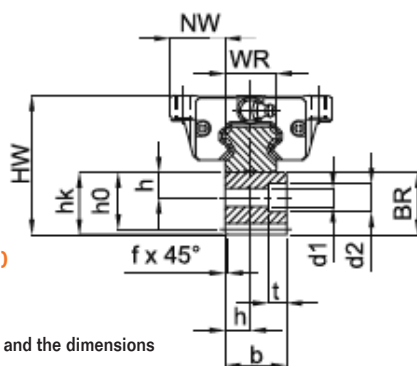
- 1) 1 = helical, ground, hardened (6h23)
2 = straight teeth, ground, hardened (6h23)
3 = helical, milled, soft (9h27)
4 = straight teeth, milled, soft (9h27)
- 2) design and dimensions of the blocks acc. to HG series
- 3) racks with great length are delivered in several parts. To bring them into the correct pitch position, a mounting piece can be delivered.
- 4) maximum pitch error of the rack; rack length 300 mm.

LINEAR GUIDEWAY WITH RACK Z SERIES

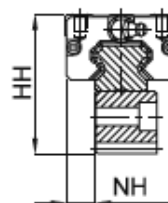
180° guideway with rack, helical



180° version, helical,
right hand 19°31'42"



block type HGW.. 2)



block type HGH.. 2)

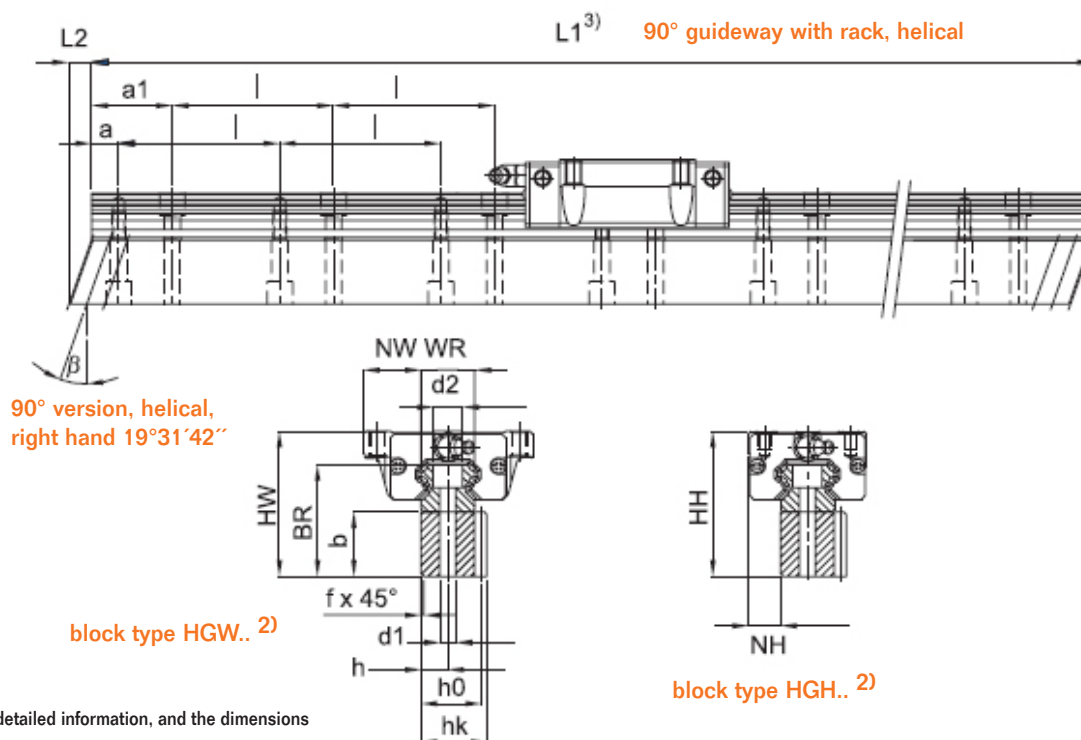
For more detailed information, and the dimensions
of our racks for guideways, please see pages 28 - 29.

Part no.	toothing quality 1)	design	GT f/300 4)	module	L1 ³⁾	L2	b	hk	h0	f	a	rack
Z1HGR15R	1	180°	0.022	2	960	6.7	19	19.50	17.50	1	10	A15-020-100
Z3HGR15R	3	180°	0.061	2	1920	7.1	20	19.50	17.50	1	10	A33-020-200
Z1HGR20R	1	180°	0.022	2	960	8.5	24	24.50	22.50	1	10	A15-020-100-24
Z3HGR20R	3	180°	0.061	2	1920	8.9	25	24.50	22.50	1	10	A33-020-200-25
Z1HGR25R	1	180°	0.024	3	960	10.3	29	29.75	26.75	2	10	A15-030-100
Z3HGR25R	3	180°	0.065	3	1920	10.6	30	29.75	26.75	2	10	A33-030-200
Z1HGR30R	1	180°	0.025	4	960	13.8	39	39.75	35.75	2	20	A15-040-100
Z3HGR30R	3	180°	0.068	4	1920	14.2	40	39.75	35.75	2	20	A33-040-200
Z1HGR35R	1	180°	0.025	4	960	13.8	39	48.75	44.75	2	20	A17-040-100-1
Z1HGR45R	1	180°	0.025	4	840	17.4	49	58.00	54.00	2	30	A17-040-100-49

Part no.	a1	l	h	d1	d2	t	BR	WR	NW	HW	NH	HH
Z1HGR15R	30	60	7.5	5.8	10	6	34.50	15	16.0	43.50	9.5	47.50
Z3HGR15R	30	60	7.5	5.8	10	6	34.50	15	16.0	43.50	9.5	47.50
Z1HGR20R	30	60	10.0	7.0	11	7	42.00	20	21.5	54.50	12.0	54.50
Z3HGR20R	30	60	10.0	7.0	11	7	42.00	20	21.5	54.50	12.0	54.50
Z1HGR25R	30	60	11.5	10.0	15	9	51.75	23	23.5	65.75	12.5	69.75
Z3HGR25R	30	60	11.5	10.0	15	9	51.75	23	23.5	65.75	12.5	69.75
Z1HGR30R	40	80	14.0	12.0	18	12	65.75	28	31.0	81.75	16.0	84.75
Z3HGR30R	40	80	14.0	12.0	18	12	65.75	28	31.0	81.75	16.0	84.75
Z1HGR35R	40	80	17.0	12.0	18	12	77.75	34	33.0	96.75	18.0	103.75
Z1HGR45R	60	105	22.5	14.0	20	13	96.00	45	37.5	118.00	20.5	128.00

- 1) 1 = helical, ground, hardened (6h23)
2 = straight teeth, ground, hardened (6h23)
3 = helical, milled, soft (9h27)
4 = straight teeth, milled, soft (9h27)
- 2) design and dimensions of the blocks acc. to HG series
- 3) racks with great length are delivered in several parts. To bring them into the correct pitch position, a mounting piece can be delivered.
- 4) maximum pitch error of the rack; rack length 300 mm.

LINEAR GUIDEWAY WITH RACK Z SERIES



For more detailed information, and the dimensions of our racks for guideways, please see pages 28 - 29.

Part no.	tooth quality 1)	design	GT f/300 4)	module	L1 ³⁾	L2	b	hk	h0	f	a	rack
Z1HGR15Z	1	90°	0.022	2	960	6.7	19	19.50	17.50	1	10	A17-020-100
Z3HGR15Z	3	90°	0.061	2	1920	7.1	20	19.50	17.50	1	10	A35-020-200
Z1HGR20Z	1	90°	0.022	2	960	8.5	24	24.50	22.50	1	10	A17-020-100-24
Z3HGR20Z	3	90°	0.061	2	1920	8.9	25	24.50	22.50	1	10	A35-020-200-25
Z1HGR25Z	1	90°	0.024	3	960	10.3	29	29.75	26.75	2	10	A17-030-100
Z3HGR25Z	3	90°	0.065	3	1920	10.6	30	29.75	26.75	2	10	A35-030-200
Z1HGR30Z	1	90°	0.025	4	960	13.8	39	39.75	35.75	2	20	A17-040-100
Z3HGR30Z	3	90°	0.068	4	1920	14.2	40	39.75	35.75	2	20	A35-040-200
Z1HGR35Z	1	90°	0.025	4	960	13.8	39	48.75	44.75	2	20	A17-040-100-1
Z1HGR45Z	1	90°	0.025	4	840	17.4	49	58.00	54.00	2	30	A17-040-100-49

Part no.	a1	l	h	d1	d2	t	BR	WR	NW	HW	NH	HH
Z1HGR15Z	30	60	7.5	4.5	7.5	5.3	34.0	15	16.0	43	9.5	47
Z3HGR15Z	30	60	7.5	4.5	7.5	5.3	35.0	15	16.0	44	9.5	48
Z1HGR20Z	30	60	10.0	6.0	9.5	8.5	41.5	20	21.5	54	12.0	54
Z3HGR20Z	30	60	10.0	6.0	9.5	8.5	42.5	20	21.5	55	12.0	55
Z1HGR25Z	30	60	11.5	7.0	11.0	9.0	51.0	23	23.5	65	12.5	69
Z3HGR25Z	30	60	11.5	7.0	11.0	9.0	52.0	23	23.5	66	12.5	70
Z1HGR30Z	40	80	14.0	10.0	15.0	9.0	65.0	28	31.0	81	16.0	84
Z3HGR30Z	40	80	14.0	10.0	15.0	9.0	66.0	28	31.0	82	16.0	85
Z1HGR35Z	40	80	17.0	10.0	15.0	9.0	68.0	34	33.0	87	18.0	94
Z1HGR45Z	60	105	22.5	14.0	20.0	13.0	87.0	45	37.5	109	20.5	119

1) 1 = helical, ground, hardened (6h23)

2 = straight teeth, ground, hardened (6h23)

3 = helical, milled, soft (9h27)

4 = straight teeth, milled, soft (9h27)

2) design and dimensions of the blocks acc. to HG series

3) racks with great length are delivered in several parts. To bring them into the correct pitch position, a mounting piece can be delivered.

4) maximum pitch error of the rack; rack length 300 mm.