



Stainless Crossed Roller Rail Sets

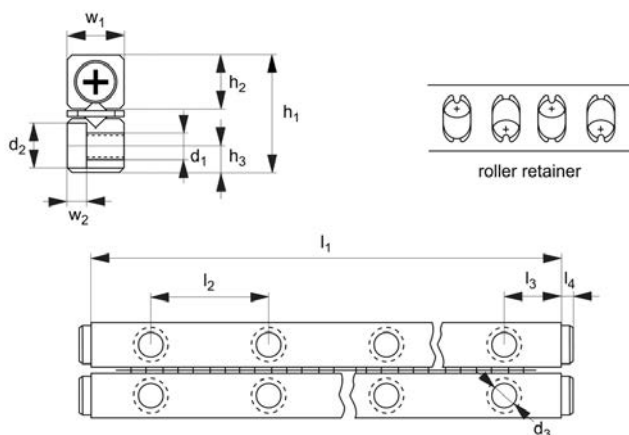
corrosion resistant

Linear Rail Sets



L1001

LINEAR RAIL SETS



Material

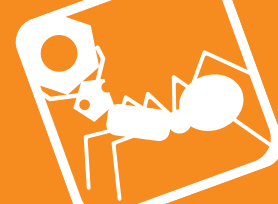
Stainless steel rail and rollers (AISI 440C). Hardness 60 ± 2 HRC. Stainless steel roller retainer (AISI 304).

Technical Notes

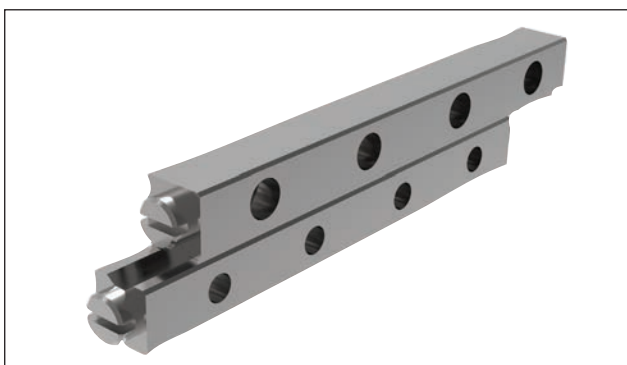
Supplied in sets of 4 rails (with 2 roller cages and 8 end screws as standard). See table for number of rollers in each cage.

Crossed roller cages can be cut to length to alter stroke - but this affects load rating, please see technical pages.

Order No.	l_1	Stroke max.	w_1	h_1 +0 -0.3	h_2	h_3	l_2	l_3	l_4	No. of rollers	Dyn. load C kN max.	Static load C_0 kN max.	d_1	d_2	d_3	w_2	Weight kg
L1001.01-020	20	13	4	8,5	3,9	1,8	10	5	1,3	5	0,63	0,72	1,65	3,0	M 2	1,4	0,01
L1001.01-030	30	21	4	8,5	3,9	1,8	10	5	1,3	7	0,88	1,01	1,65	3,0	M 2	1,4	0,01
L1001.01-040	40	29	4	8,5	3,9	1,8	10	5	1,3	9	1,13	1,30	1,65	3,0	M 2	1,4	0,02
L1001.01-050	50	37	4	8,5	3,9	1,8	10	5	1,3	11	1,38	1,58	1,65	3,0	M 2	1,4	0,02
L1001.01-060	60	45	4	8,5	3,9	1,8	10	5	1,3	13	1,63	1,88	1,65	3,0	M 2	1,4	0,03
L1001.01-070	70	53	4	8,5	3,9	1,8	10	5	1,3	15	1,88	2,16	1,65	3,0	M 2	1,4	0,03
L1001.01-080	80	61	4	8,5	3,9	1,8	10	5	1,3	17	2,13	2,45	1,65	3,0	M 2	1,4	0,03
L1001.02-030	30	24	6	12	5,5	2,5	15	7,5	1,5	5	1,47	1,46	2,55	4,4	M 3	2,0	0,03
L1001.02-045	45	30	6	12	5,5	2,5	15	7,5	1,5	8	2,34	2,34	2,55	4,4	M 3	2,0	0,04
L1001.02-060	60	44	6	12	5,5	2,5	15	7,5	1,5	10	2,93	2,92	2,55	4,4	M 3	2,0	0,06
L1001.02-075	75	58	6	12	5,5	2,5	15	7,5	1,5	12	3,52	3,50	2,55	4,4	M 3	2,0	0,07
L1001.02-090	90	72	6	12	5,5	2,5	15	7,5	1,5	14	4,10	4,09	2,55	4,4	M 3	2,0	0,08
L1001.02-105	105	86	6	12	5,5	2,5	15	7,5	1,5	16	2,50	4,34	2,55	4,4	M 3	2,0	0,10
L1001.02-120	120	100	6	12	5,5	2,5	15	7,5	1,5	18	5,27	5,26	2,55	4,4	M 3	2,0	0,11
L1001.02-135	135	106	6	12	5,5	2,5	15	7,5	1,5	21	6,15	6,13	2,55	4,4	M 3	2,0	0,13
L1001.02-150	150	120	6	12	5,5	2,5	15	7,5	1,5	23	6,74	6,72	2,55	4,4	M 3	2,0	0,14
L1001.02-165	165	134	6	12	5,5	2,5	15	7,5	1,5	25	7,33	7,30	2,55	4,4	M 3	2,0	0,15
L1001.02-180	180	148	6	12	5,5	2,5	15	7,5	1,5	27	7,91	7,88	2,55	4,4	M 3	2,0	0,17
L1001.03-050	50	34	8	18	8,3	3,5	25	12,5	2,0	7	4,47	5,33	3,3	6,0	M 4	3,1	0,10
L1001.03-075	75	54	8	18	8,3	3,5	25	12,5	2,0	10	6,38	7,61	3,3	6,0	M 4	3,1	0,15
L1001.03-100	100	74	8	18	8,3	3,5	25	12,5	2,0	13	8,29	9,89	3,3	6,0	M 4	3,1	0,20
L1001.03-125	125	104	8	18	8,3	3,5	25	12,5	2,0	15	9,57	11,4	3,3	6,0	M 4	3,1	0,24
L1001.03-150	150	124	8	18	8,3	3,5	25	12,5	2,0	18	11,5	13,7	3,3	6,0	M 4	3,1	0,29
L1001.03-175	175	144	8	18	8,3	3,5	25	12,5	2,0	21	13,4	16,0	3,3	6,0	M 4	3,1	0,34
L1001.03-200	200	164	8	18	8,3	3,5	25	12,5	2,0	24	15,3	18,3	3,3	6,0	M 4	3,1	0,38
L1001.03-225	225	184	8	18	8,3	3,5	25	12,5	2,0	27	17,2	20,6	3,3	6,0	M 4	3,1	0,43
L1001.03-250	250	204	8	18	8,3	3,5	25	12,5	2,0	30	19,1	22,8	3,3	6,0	M 4	3,1	0,48
L1001.03-275	275	224	8	18	8,3	3,5	25	12,5	2,0	33	21,1	25,1	3,3	6,0	M 4	3,1	0,53
L1001.03-300	300	244	8	18	8,3	3,5	25	12,5	2,0	36	23,0	27,4	3,3	6,0	M 4	3,1	0,57
L1001.04-080	80	54	11	22	10	4,5	40	20	2,0	8	9,84	9,36	4,3	7,5	M 5	4,1	0,26
L1001.04-120	120	92	11	22	10	4,5	40	20	2,0	11	13,5	12,9	4,3	7,5	M 5	4,1	0,39
L1001.04-160	160	130	11	22	10	4,5	40	20	2,0	14	17,2	16,4	4,3	7,5	M 5	4,1	0,51
L1001.04-200	200	154	11	22	10	4,5	40	20	2,0	18	22,1	21,1	4,3	7,5	M 5	4,1	0,64



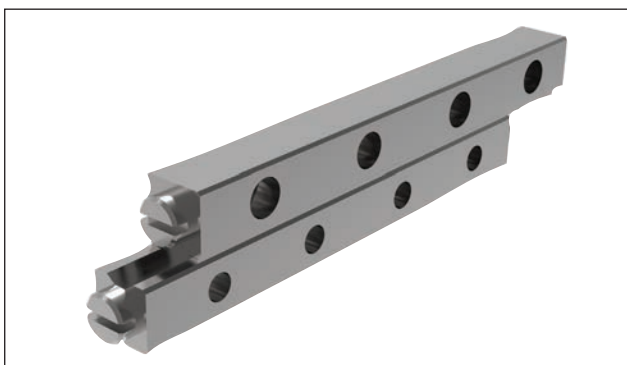
Order No.	l_1	Stroke max.	w_1	h_1 +0 -0.3	h_2	h_3	l_2	l_3	l_4	No. of rollers	Dyn. load C kN max.	Static load C_0 kN max.	d_1	d_2	d_3	w_2	Weight kg
L1001.04-240	240	192	11	22	10	4,5	40	20	2,0	21	25,8	24,6	4,3	7,5	M 5	4,1	0,76
L1001.04-280	280	230	11	22	10	4,5	40	20	2,0	24	29,5	28,1	4,3	7,5	M 5	4,1	0,89
L1001.04-320	320	254	11	22	10	4,5	40	20	2,0	28	34,4	32,8	4,3	7,5	M 5	4,1	1,01
L1001.04-360	360	292	11	22	10	4,5	40	20	2,0	31	38,1	36,3	4,3	7,5	M 5	4,1	1,14
L1001.04-400	400	330	11	22	10	4,5	40	20	2,0	34	41,8	39,8	4,3	7,5	M 5	4,1	1,27
L1001.04-440	440	354	11	22	10	4,5	40	20	2,0	38	46,7	44,5	4,3	7,5	M 5	4,1	1,39
L1001.04-480	480	392	11	22	10	4,5	40	20	2,0	41	50,4	48,0	4,3	7,5	M 5	4,1	1,51
L1001.06-100	100	80	15	31	14	6	50	25	2,0	7	18,0	18,4	5,3	9,5	M 6	5,2	9,62
L1001.06-150	150	108	15	31	14	6	50	25	2,0	11	28,3	29,0	5,3	9,5	M 6	5,2	0,93
L1001.06-200	200	154	15	31	14	6	50	25	2,0	14	36,0	36,9	5,3	9,5	M 6	5,2	1,24
L1001.06-250	250	200	15	31	14	6	50	25	2,0	17	43,7	44,8	5,3	9,5	M 6	5,2	1,55
L1001.06-300	300	246	15	31	14	6	50	25	2,0	20	51,4	52,6	5,3	9,5	M 6	5,2	1,85
L1001.06-350	350	274	15	31	14	6	50	25	2,0	24	61,7	63,2	5,3	9,5	M 6	5,2	2,16
L1001.06-400	400	320	15	31	14	6	50	25	2,0	27	69,4	71,1	5,3	9,5	M 6	5,2	2,47
L1001.06-450	450	366	15	31	14	6	50	25	2,0	30	77,1	79,0	5,3	9,5	M 6	5,2	2,77
L1001.06-500	500	412	15	31	14	6	50	25	2,0	33	84,8	86,9	5,3	9,5	M 6	5,2	3,08
L1001.06-550	550	458	15	31	14	6	50	25	2,0	36	92,5	94,8	5,3	9,5	M 6	5,2	3,38
L1001.06-600	600	486	15	31	14	6	50	25	2,0	40	103,0	105,0	5,3	9,5	M 6	5,2	3,69



Standard cross roller rail sets

L1000 & L1001

- Seven rail profiles (Sizes 1-12)
- Lengths: 20mm to 1 metre
- L1000 standard rail set
- L1001 corrosion resistant rail sets



Deep groove and anti-creep rail sets

L1002 + L1003

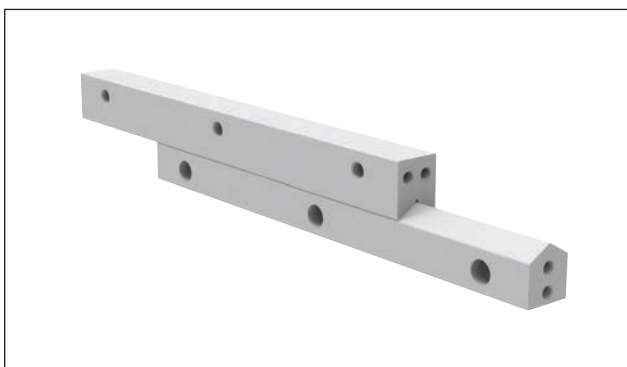
- 3 x load capacity of standard rail sets (due to deep V groove)
- Two rail profiles (Sizes 4 & 6)
- Lengths 50mm to 400mm
- Anti-creep versions for high acceleration applications



Needle roller rail sets

L1004

- Heavy load ratings and needle rollers are used
- Five rail profile size
- Lengths: 200mm to 1.2 metres



Anti-friction coated rail sets

L1005 & L1006

- Same profile as needle roller rails but contact face Teflon coated.
- Ideal for harsh, dirty conditions
- Vibration damping characteristics



Our cross roller rail sets are of the highest quality.

- Close tolerance $\pm 5\mu$
- Speeds up to 50 m/min
- Temperature range -40°C to $+80^{\circ}\text{C}$ up to $+250^{\circ}\text{C}$ if applying a temperature factor
- Through hardened to 60 ± 2 HRC
- Acceleration up to 50 m/sec^2
- Typical 0.003 coefficient of friction dependent on mounting surface accuracy

Expected life calculation:

$$\text{Life (Km)} L = (C/P)^{3.3} \times 1.15 \times 10^5 \text{m}$$

C = effective dynamic load (N)

P = equivalent load (N)

Working life calculation:

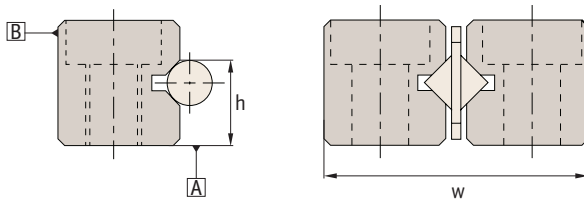
$$L_h \text{ (hours)} = \frac{L \times 10^6}{2 \times L_s \times n \times 60}$$

L = Life (Km), see above

L_s = Stroke Length (mm)

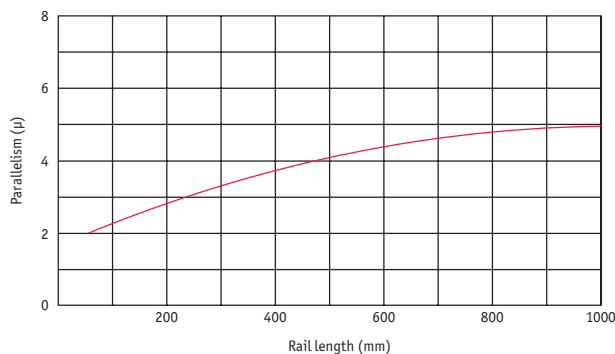
n = Number of operations/min

Accuracy Specification:



Accuracy level	
Parallelism of rolling plane A&B	graph below
Allowable height tolerance (h)	$\pm 0,02$
Paired mutual height tolerance (h)	0,01
Allowable width tolerance (w)	$+0, -0,02$

Parallelism



Lubrication:

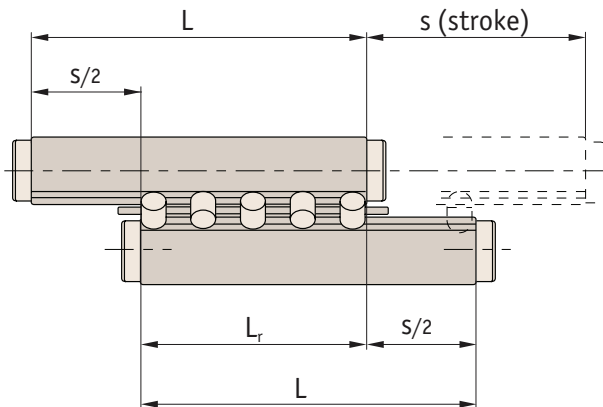
The units are lubricated with lithium soap lubricant. Relubricate if required.

Straightness		
Length (mm)		Straightness (μ)
Above	Below	
0	50	2,0
50	100	2,0
100	160	3,0
160	310	3,0
310	510	4,0
510	600	4,0

(Ra 0,2 μm)

Load capacity depends on:

- Rail size
- Number of rollers in cage
- Load rating = number of rollers x load rating/roller
- Number of rollers (N_r) = cage length (L_c) / pitch p
- Cage length affects the stroke and travel of the system



Load calculations

Calculations of retainer length and number of rollers:

$$L_r = L - \frac{S}{2}$$

L_r = distance between two rollers in ends of retainer (mm)

L = rail length (mm)

S = stroke length (mm)

Worked example:

Assume L1000.09-400 with a stroke of 250mm:

Cage length = $400 - (250/2) = 275\text{mm}$

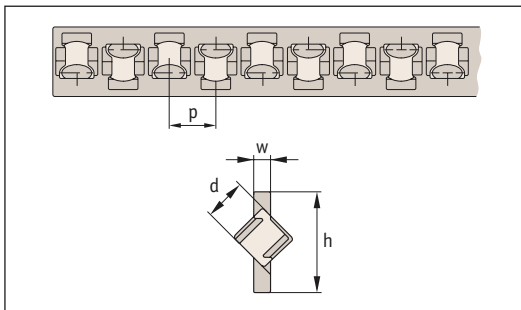
Roller $\varnothing = 9\text{mm}$ with a pitch (see table) of 18mm:

Number of rollers = $275/18 = 15$

Load rating of system = load/roller* x no. of rollers
(a pair of rollers) = $2420\text{N} \times 15$
= 36,300N

*See product table for allowable load per roller.

Allowable load rating with a 3x safety factor compared to static load.



Plastic cage



L1008.###-PR-xxx

Plastic cage with steel rollers,
for horizontal and vertical use.

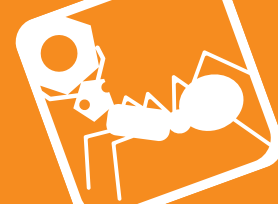
Steel cage



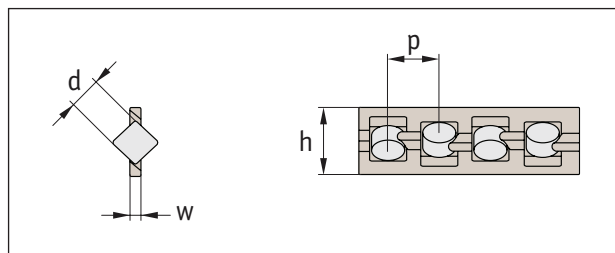
L1008.###-AA-xxx

Steel cage with steel rollers,
for horizontal use only.

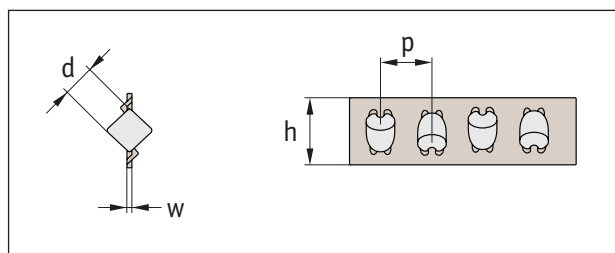
Order no.	d	p	h	w	Cage material
L1008.020-PR-xxx	2	3,9	5	0,75	Plastic - black
L1008.030-PR-xxx	3	5,0	7	1,00	Plastic - black
L1008.060-PR-xxx	6	8,5	14	2,00	Plastic - black
L1008.090-PR-xxx	9	14,0	20	3,00	Plastic - black
L1008.020-AA-xxx	2	4	5,5	0,80	Steel
L1008.030-AA-xxx	3	5	7,5	0,50	Steel
L1008.060-AA-xxx	6	12	14	0,80	Steel
L1008.090-AA-xxx	9	18	19,5	1,00	Steel
L1008.120-AA-xxx	12	22	25	1,20	Steel



Plastic cage (type PR)



Steel cage (type AA)



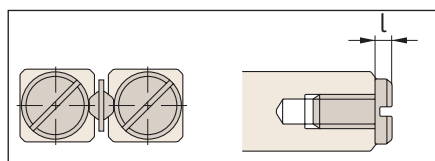
Roller load ratings (per roller)

Rail size	Max. dynamic load C_0 N	Max. static load C N	Allowable* load N
1	125	144	48
2	290	290	95
3	630	760	250
4	1230	1170	390
6	2570	2630	870
9	7190	7270	2420
12	14700	13100	4300

The more rollers the greater the load capacity

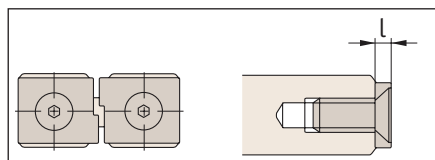
* Allowable load is 1/3 of max. static load/roller, to allow a safety factor in calculations of 3.

End pieces



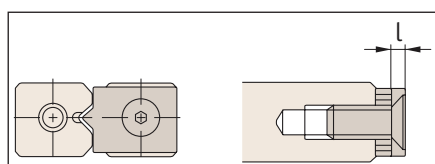
Type GA

- For horizontal applications, most used.



Type GB

- For horizontal or vertical applications.

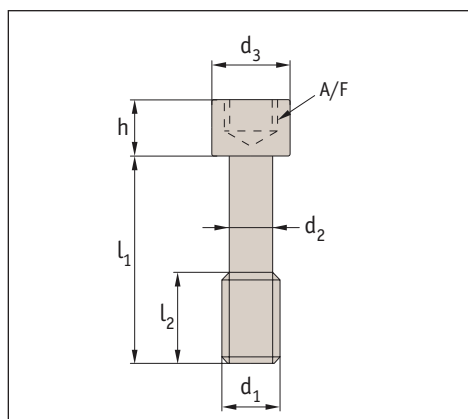


Type GC

- For horizontal or vertical applications.
- Mount on longer rail only.

Rail size	Type		
	GA l	GB l	GC l
1	1,5	-	-
2	2	3	-
3	2	2	3
6	3	3	5
9	3	4	6
12	3	5	8

End screws



Rail	h	d ₁	d ₂	d ₃	l ₁	l ₂	A/F
3	3	M3	2,3	5	12	5	2,5
6	5	M5	3,9	8	20	8	4
9	6	M6	4,6	8,5	30	12	5
12	8	M8	6,25	11,3	40	17	6