

		design force (kN): 3.5				m (kg) C (£)				FC: adj		m (kg) C (£)				FC: per		m (kg) C (£)							
		design moment (Nm): 135.5				target		7 £ 70				frame		19.0 £ 455				frame		9.6 £ 201					
		min safety factor: 2.5		4		max		15 £ 200				bike		25.0 £ 555				bike		16.6 £ 351					
ID		characteristics								joint				link				approx weight (kg)				approx cost:			
technology	product line	D (mm)	t (mm)	d (mm)	rho (g/cc)	c (mm)	A (mm^2)	Sy (MPa)	Ic (mm4)	screw Fs (kN)	Fs (kN)	Mb (Nm)	min sf	Sd (Mpa)	Sb (Mpa)	Sc (Mpa)	sf	link (/m)	/joint	total (4m, 6 joints)	link (/m)	/joint	/cut		
item24 industrial building kits	Profiles 5	20	-	M5	2.7	10	180	195	7200	1	0.20	5	0.037	19.4	188.2	207.6	0.939	0.49	0.081	2.4	£6.99	£16.95	£2.70		
	Profiles 6	30	-	M6	2.7	15	467	195	41500	3.5	0.50	10	0.07	7.5	49.0	56.5	3.453	1.26	0.163	6.0	£12.29	£16.84	£2.70		
	Profiles 6 L	30	-	M6	2.7	15	343	195	29000	1	0.50	10	0.07	10.2	70.1	80.3	2.429	0.93	0.163	4.7	£9.29	£16.84	£2.70		
	Profiles 6 D30	30	-	M6	2.7	15	279	195	16900	3.5	0.50	10	0.07	12.5	120.3	132.8	1.468	0.75	0.163	4.0	£12.12	£12.00	£2.70		
	Profiles 8	40	-	M8	2.7	20	916	195	139600	10	0.75	20	0.15	3.8	19.4	23.2	8.393	2.47	0.41	12.4	£17.66	£12.24	£2.70		
	Profiles 8 L	40	-	M8	2.7	20	646	195	90000	5	0.75	20	0.15	5.4	30.1	35.5	5.488	1.74	0.41	9.4	£11.17	£12.24	£2.70		
	Profiles 8 E	40	-	M8	2.7	20	507	195	73800	3.5	0.75	20	0.15	6.9	36.7	43.6	4.47	1.37	0.41	7.9	£10.71	£12.24	£2.70		
	Profiles 8 D40	40	-	M8	2.7	20	545	195	56300	7	0.75	20	0.15	6.4	48.1	54.6	3.574	1.47	0.41	8.3	£19.23	£12.13	£2.70		
	Profiles 10	50	-	M10	2.7	25	1331	195	306800	14	1.50	25	0.18	2.6	11.0	13.7	14.26	3.59	0.8	19.2	£34.16	£5.78	£2.70		
	Profiles 10 E	50	-	M10	2.7	25	847	195	203400	7	1.50	25	0.18	4.1	16.7	20.8	9.381	2.29	0.8	13.9	£22.90	£5.78	£2.70		
	Profiles 12	60	-	M12	2.7	30	2060	195	705000	20	2.00	34	0.25	1.7	5.8	7.5	26.12	5.56	0.14	23.1	£61.90	£13.58	£3.85		
	Profiles 12 L	60	-	M12	2.7	30	1450	195	460200	10	2.00	34	0.25	2.4	8.8	11.2	17.34	3.92	0.25	17.2	£45.01	£13.58	£3.85		
tube and bracket	graphit; aluminium hi-load	28.6	3.5	21.6	2.7	14.3	276.0	250	22157.1	-	0.74	-	0.21	12.7	87.5	100.1	2.497	0.75	0.52	6.1	£5.50	£1.50	£0.50		
	steel 27mm light	26.9	2.3	22.3	8	13.45	177.8	195	13563.5	16	14	2500	4.00	19.7	134.4	154.1	1.266	1.42	0.3	7.5	£2.40	£2.04	£0.00		
	steel 34mm light	33.8	2.6	28.6	8	16.9	254.8	195	31225.0	16	14	2500	4.00	13.7	73.3	87.1	2.24	2.04	0.45	10.9	£3.38	£2.50	£0.00		
	steel 42mm light	42.5	2.6	37.3	8	21.25	325.9	195	65131.7	16	14	2500	4.00	10.7	44.2	54.9	3.549	2.61	0.72	14.7	£4.19	£3.08	£0.00		
	steel 27mm medium	27.2	2.6	22	8	13.6	200.9	195	15369.6	16	14	2500	4.00	17.4	119.9	137.3	1.42	1.61	0.3	8.2	£2.55	£2.04	£0.50		
	steel 34mm medium	34.2	3.2	27.8	8	17.1	311.6	195	37835.4	16	14	2500	4.00	11.2	61.2	72.5	2.691	2.49	0.45	12.7	£3.56	£2.50	£0.50		
	steel 42mm medium	42.9	3.2	36.5	8	21.45	399.1	195	79139.6	16	14	2500	4.00	8.8	36.7	45.5	4.286	3.19	0.72	17.1	£4.41	£3.08	£0.50		
kee hand railings	aluminium 33.4mm	33.4	3.38	26.64	2.7	16.7	318.8	250	36364.7	14	12	1500	3.43	11.0	62.2	73.2	3.415	0.86	0.22	4.8	£5.49	£12.00	£0.00		
	aluminium 33.7mm	33.7	3.2	27.3	2.7	16.85	306.6	250	36046.6	14	12	1500	3.43	11.4	63.3	74.8	3.344	0.83	0.22	4.7	£5.48	£12.00	£0.00		
	aluminium 42.2mm	42.16	3.56	35.04	2.7	21.08	431.7	250	81086.8	14	12	1500	3.43	8.1	35.2	43.3	5.769	1.17	0.35	6.8	£16.65	£16.00	£0.00		
	aluminium 42.4mm	42.4	2.6	37.2	2.7	21.2	325.1	250	64644.5	14	12	1500	3.43	10.8	44.4	55.2	4.529	0.88	0.35	5.6	£24.56	£16.00	£0.00		
	aluminium 33.4mm links;																								
	steel 34mm clamps	33.4	3.38	26.64	2.7	16.7	318.8	250	36364.7	16	14	2500	4.00	11.0	62.2	73.2	3.415	0.86	0.45	6.1	£5.49	£2.50	£0.00		
	aluminium 1 5/8" SWG 10;																								
	steel 42mm clamps	41.27	3.2	34.87	2.7	20.64	382.7	250	69825.8	16	14	2500	4.00	9.1	40.0	49.2	5.08	1.03	0.72	8.5	£8.82	£3.08	£0.50		
	aluminium 1 5/8" SWG 16;																								
	steel 42mm clamps	41.27	1.6	38.07	2.7	20.64	199.4	170	39289.1	16	14	2500	4.00	17.6	71.2	88.7	1.92	0.54	0.72	6.5	£4.32	£3.08	£0.50		
	aluminium 42.2mm; steel																								
	42mm clamps	42.16	3.56	35.04	2.7	21.08	431.7	250	81086.8	16	14	2500	4.00	8.1	35.2	43.3	5.77	1.17	0.72	9.0	£16.65	£3.08	£0.00		
aluminium 42.4mm; steel																									
42mm clamps	42.4	2.6	37.2	2.7	21.2	325.1	250	64644.5	16	14	2500	4.00	10.8	44.4	55.2	4.53	0.88	0.72	7.8	£24.56	£3.08	£0.00			
RK Tube Connectors	Solid Clamps 30x3 6082T6	30	3	24	2.7	15	254.5	250	23474.8	-	4.8	148	1.09	13.8	86.6	100.3	2.49	0.69	0.344	4.8	£7.66	£31.40	£0.50		
	Solid Clamps 30x2 6060	30	2	26	2.7	15	175.9	150	17329.0	-	4.8	148	1.09	19.9	117.3	137.18	1.09	0.48	0.344	4.0	£5.13	£31.40	£0.50		
	Solid Clamps 40x3 6082T6	40	3	34	2.7	20	348.7	250	60066.5	-	6	376	1.71	10.0	45.1	55.15	4.53	0.94	0.861	8.9	£10.26	£39.19	£0.50		
	Solid Clamps 40x1.5 6063T6	40	2	36	2.7	20	238.8	170	43215.7	-	6	376	1.71	14.7	62.7	77.368	2.20	0.64	0.861	7.7	£9.24	£39.19	£0.50		
	Solid Clamps 50x3 6060	50	3	44	2.7	25	443.0	150	122811.9	-	12	695	3.43	7.9	27.6	35.48	4.23	1.20	1.166	11.8	£12.97	£42.52	£0.50		
	Solid Clamps 50x1.5 6063T6	50	2	46	2.7	25	301.6	170	87009.6	-	12	695	3.43	11.6	38.9	50.538	3.36	0.81	1.166	10.3	£7.26	£42.52	£0.50		
RK Profiles	30x30	30	-	-	2.7	15	363.0	250	33000					9.6	61.6	71.233	3.51	0.98		3.9					
	40x40	40	-	-	2.7	20	705.0	250	112000					5.0	24.2	29.161	8.57	1.90		7.6					
	40x40 L	40	-	-	2.7	20	475.0	250	71000					7.4	38.2	45.537	5.49	1.28		5.1					
box section/ square tube	40off 12.7mm 6063	12.7	1.6	9.5	2.7	6.35	55.8	170	877.2					62.7	980.9	1043.6	0.65	0.15		2.4	£5.95				
	40off 25mm 6082T6	25	1.5	22	2.7	12.5	110.7	250	7675.7					31.6	220.7	252.27	3.96	0.30		4.8	£5.70				
polymer rod	Nylon 6 50mm +RK connect.	50	25	0	1.14	25	1963.5	82	306796.2	-	12	695	3.43	1.166	£42.52	43.686	1.88	2.24	1.166	15.9	£38.14	£42.52	£1.25		

s (£)			flexibility				score/rank					notes	
shipping	total (4m, 6j, 8c, s)		sizes intercom patible?	adjustable angle?	adjustable length?	inline 3-way joints?	corrosion resistance	S	W	C	F		total
							weight:						
£25.00	£	176.26	yes	yes	sliding +	some	yes	0	2	1	2	0	heavy duty hinges not strong enough; 1 direct fastener not strong enough; angle clamps probably not strong enough
£25.00	£	196.80	yes	yes	sliding +	some	yes	0	2	1	2	0	
£25.00	£	184.80	yes	yes	sliding +	some	yes	0	2	1	2	0	
£25.00	£	167.08	yes	yes	sliding +	some	yes	0	2	1	2	0	
£25.00	£	190.68	yes	yes	sliding +	some	yes	0	1	1	2	0	
£25.00	£	164.72	yes	yes	sliding +	some	yes	0	1	1	2	0	
£25.00	£	162.88	yes	yes	sliding +	some	yes	0	1	1	2	0	
£25.00	£	196.30	yes	yes	sliding +	some	yes	0	1	1	2	0	
£25.00	£	217.92	yes	no	limited	limited	yes	0	0	0	1	0	
£25.00	£	172.88	yes	no	limited	limited	yes	0	1	1	1	0	
£25.00	£	384.88	yes	no	limited	limited	yes	0	0	0	1	0	
£25.00	£	317.32	yes	no	limited	limited	yes	0	0	0	1	0	
£25.00	£	60.00	some	yes	sliding	yes	yes	0	2	2	2	0	lightweights
£6.00	£	27.86	some	yes	sliding	yes	galvanised	0	1	2	2	0	
£6.00	£	34.52	some	yes	sliding	yes	galvanised	1	1	2	2	4	
£6.00	£	41.23	some	yes	sliding	yes	galvanised	1	1	2	2	4	
£10.00	£	36.46	some	yes	sliding	yes	galvanised	0	1	2	2	0	
£10.00	£	43.25	some	yes	sliding	yes	galvanised	1	1	2	2	4	
£10.00	£	50.10	some	yes	sliding	yes	galvanised	2	0	2	2	0	
£35.00	£	128.96	no	no	sliding	swivel only	yes	1	2	1	1	2	fasten with grub screw directly into tube; may damage tube and make adjustment more difficult; note with 1 5/8" connector fit may be compromised
£35.00	£	128.92	no	no	sliding	swivel only	yes	1	2	1	1	2	
£35.00	£	197.60	no	some	sliding	swivel only	yes	2	2	1	1	4	
£35.00	£	229.22	no	some	sliding	swivel only	yes	2	2	0	1	0	
£20.00	£	56.96	some	yes	sliding	yes	links:yes; joints:galv.	1	2	2	2	8	
£35.00	£	92.74	some	yes	sliding	yes	links:yes; joints:galv.	2	1	1	2	4	
£35.00	£	74.75	some	yes	sliding	yes	links:yes; joints:galv.	0	2	1	2	0	
£35.00	£	120.06	some	yes	sliding	yes	links:yes; joints:galv.	2	1	1	2	4	
£35.00	£	151.68	some	yes	sliding	yes	links:yes; joints:galv.	2	1	1	2	4	
£25.00	£	248.04	yes	yes	yes	no	yes	0	2	0	2	0	clamps around circumference; looks promising! (expensive)
£25.00	£	237.93	yes	yes	yes	no	yes	0	2	0	2	0	
£25.00	£	305.20	yes	yes	yes	no	yes	0	1	0	2	0	
£25.00	£	301.11	yes	yes	yes	no	yes	0	1	0	2	0	
£25.00	£	336.01	yes	yes	yes	no	yes	2	1	0	2	0	
£25.00	£	313.16	yes	yes	yes	no	yes	1	1	0	2	0	
	£	-	some	yes	sliding	no	yes	1	2	1	1	2	need more data
	£	-	some	yes	sliding	no	yes	2	1	1	1	2	
	£	-	some	yes	sliding	no	yes	2	2	1	1	4	
£12.50	£	107.70	yes	no	discreet	no	yes	0	2	1	0	0	limited flexibilty
£12.50	£	103.70	yes	no	discreet	no	yes	1	2	1	0	0	
£15.00	£	432.68	yes	yes	no	no	yes	0	0	0	1	0	what did I expect?