

**"the fitting solution"<sup>SM</sup>**

# tubeclamps™

## tubeclamps™ FITTING SPECIFICATION

A **tubeclamps™** fitting is an iron casting and galvanised to BS EN 1461 1999.  
The **tubeclamps™** fitting is supplied with Deltatone™ coated case hardened set screws as standard.

## EASY TO USE

**tubeclamps™** fittings are manufactured with simplicity and ease of use very much in mind. No special skills required - no welding, no bending, no threading just an Allen key to tighten the set screws and you can join tubing together in a matter of seconds. The comprehensive range of fittings and sizes means that **tubeclamps™** fittings can be used in a wide variety of applications, temporary or permanent.

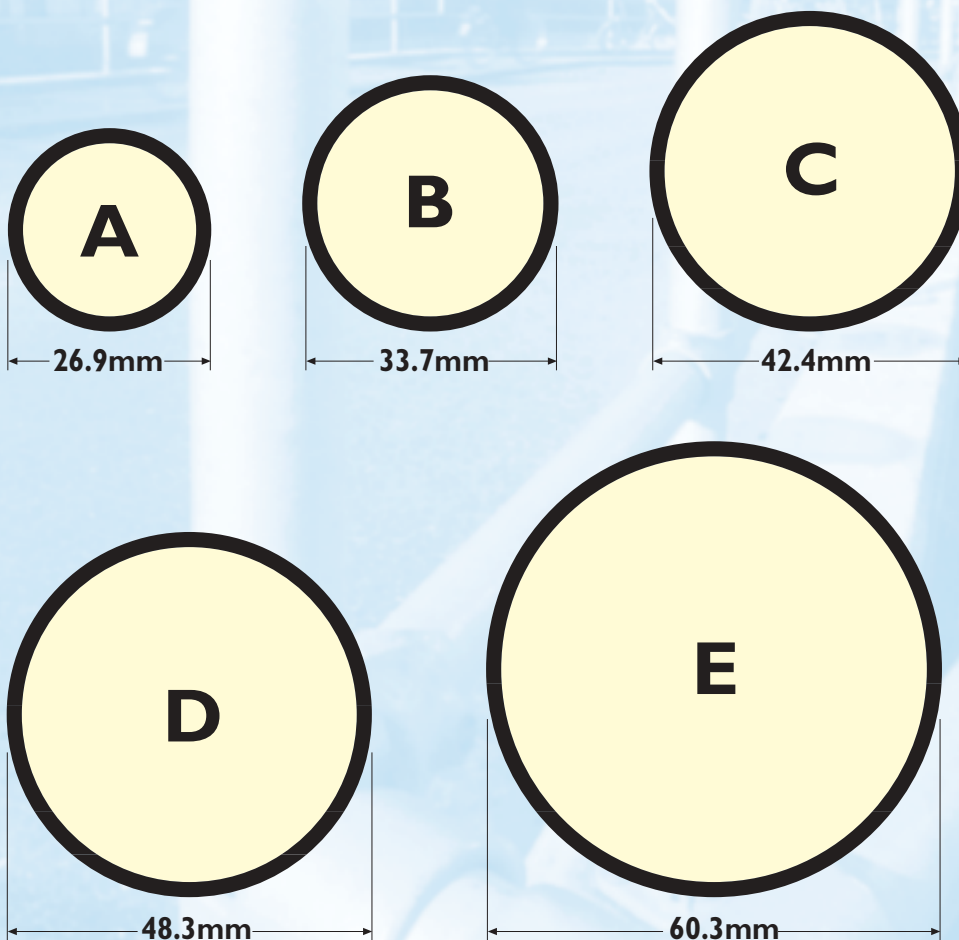
## SELECTING A tubeclamps™ FITTING

Selecting a **tubeclamps™** fitting is simple. Select the suitable fitting for the application required, select the suitable size of tube for the application required and combine the two reference numbers.

E.g. Long Tee to suit 48.3 O/D tube = 104D

**On the dimension chart a, b, c, d, e, refers to fitting dimensions.**  
**∅ indicates fixing hole diameter and kg indicates fitting weight.**

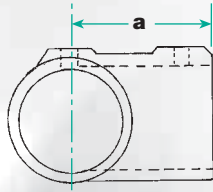
## TUBE SIZES



TUBE SIZES		
	TUBE DIA. O/D MM	TUBE DIA. O/D INCHES
<b>A</b>	26.9mm	1 1/16" (1.05")
<b>B</b>	33.7mm	1 1/32" (1.315")
<b>C</b>	42.4mm	1 1/16" (1.66")
<b>D</b>	48.3mm	1 29/32" (1.904")
<b>E</b>	60.3mm	2 3/8" (2.375")

Whilst every care has been taken to ensure that the information given in this manual is correct, Tubeclamps Limited reserve the right to alter and revise this information, as and when they consider it necessary. This is in line with their policy of research and development.

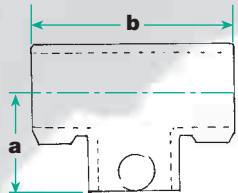
## 101 SHORT TEE



Typical use on straight and level guardrails to connect the upright to the top rail or end or mid rail to the upright. Tubes cannot be joined inside a 101, to join tubes inside the fitting use the 104. Normally used in conjunction with the 125 fitting.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
101A	26.9	40						0.19
101B	33.7	48						0.35
101C	42.4	60						0.52
101D	48.3	67						0.55
101E	60.3	86						1.20

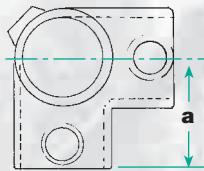
## 104 LONG TEE



Typical use on straight and level guardrail to connect the upright to the top rail. Tubes can be joined inside the 104 fitting. Normally used in conjunction with the 119 fitting.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
104A	26.9	40	80					0.35
104B	33.7	48	96					0.61
104C	42.4	60	122					0.93
104D	48.3	67	134					1.05
104E	60.3	86	172					1.90

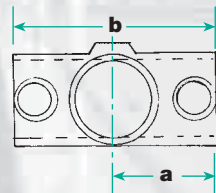
## 116 3 WAY THROUGH



Typical use on straight and level guardrail to connect the mid rails to the upright at a 90° corner. Normally used in conjunction with the 128 fitting.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
116A	26.9	40						0.26
116B	33.7	48						0.49
116C	42.4	60						0.76
116D	48.3	67						0.90
116E	60.3	86						1.70

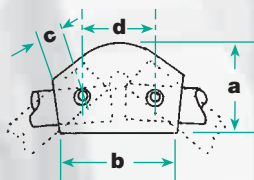
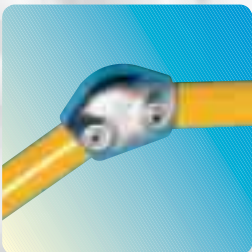
## 119 2 SOCKET CROSS



Typical use on straight and level guardrail to connect the mid rails to the upright. The uprights in guardrails must remain continuous with the cross rails being cut. Normally used in conjunction with the 104 fitting.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
119A	26.9	40	80					0.36
119B	33.7	48	96					0.49
119C	42.4	60	122					0.73
119D	48.3	67	134					0.75
119E	60.3	86	172					1.50

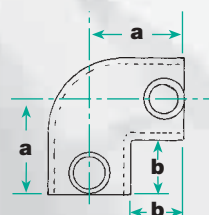
## 124 VARIABLE ELBOW 15° - 60°



Variable elbow for connecting two tubes together at angles between 15° and 60° on guardrails or handrails. This fitting avoids the need to bend tubes.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
124B	33.7	65	60	13	50			0.41
124C	42.4	80	66	16	55			0.68
124D	48.3	90	79	17	68			0.89

## 125 2 WAY ELBOW

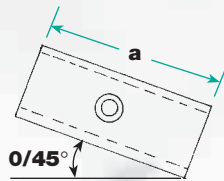
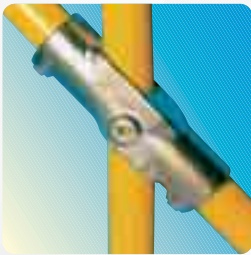


Typical use on straight and level guardrail to connect the top rails to the upright. Normally used in conjunction with the 101 fitting. This fitting can also be used to create a 90° tube bend.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
125A	26.9	40	22					0.28
125B	33.7	48	25					0.49
125C	42.4	60	33					0.72
125D	48.3	67	36					0.91
125E	60.3	86	47					1.40

# tubeclamps™

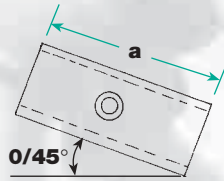
## 126 ANGLE CROSS UP TO 45°



Typical use is on sloping guardrails for connecting the mid or lower rails to the upright. The uprights in guardrails must remain continuous with the cross rails being cut. Normally used in conjunction with the 127 fitting. **Stocked as blanks, machined to order to the angle specified between 0° & 45°.**

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
126B	33.7	162						0.87
126C	42.4	190						1.20
126D	48.3	218						1.51

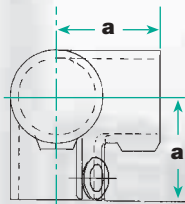
## 127 ANGLE TEE UP TO 45°



Typical use is on sloping guardrails for connecting the top rail to the upright. Normally used in conjunction with the 127 fitting. **Stocked as blanks, machined to order to the angle specified between 0° & 45°.**

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
127B	33.7	162						0.91
127C	42.4	190						1.31
127D	48.3	218						1.63

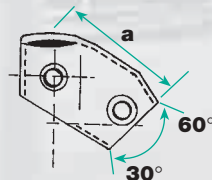
## 128 3 WAY 90° ELBOW



Typical use on straight and level guardrail to connect the 2 top rails to the upright at a 90° corner post. Normally used in conjunction with the 116 fitting.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
128A	26.9	40						0.37
128B	33.7	48						0.69
128C	42.4	60						1.00
128D	48.3	67						1.34
128E	60.3	85						1.82

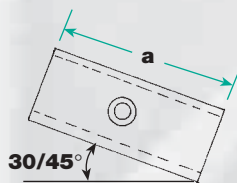
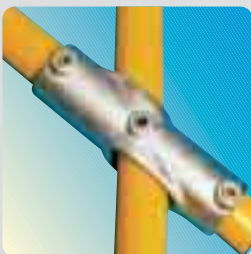
## 129 ADJUSTABLE TEE



Typical use is on steeper slopes or stairs as a tee connector with an angle between 30° & 60° with the upright remaining vertical. This fitting does not allow the through tube to be joined inside the fitting. Normally used in conjunction with the 130 fitting.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
129B	33.7	70						0.58
129C	42.4	85						0.87
129D	48.3	90						0.90

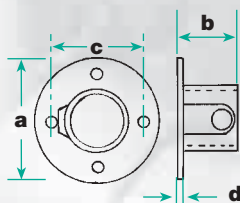
## 130 ADJUSTABLE CROSS



Typical use is on steeper slopes or stairs as an intermediate cross connector with an angle between 30° & 45° with the upright remaining vertical. The 130 is not recommended for use as the top fitting on guardrails, the 129 is recommended.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
130B	33.7	162						0.82
130C	42.4	190						1.17
130D	48.3	218						1.50

## 131 WALL FLANGE

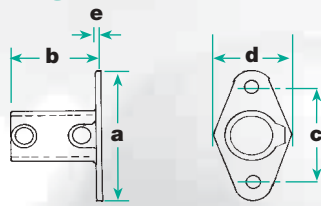


This fitting can be used for terminating cross rails to walls etc., it can also be used as a base plate for non-load bearing systems such as a bench or chair.

**THIS FITTING IS NOT TO BE USED AS A BASE PLATE FOR GUARDRAILS OR DEPENDANT STRUCTURES.**

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
131A	26.9	83	42	57	4		8	0.32
131B	33.7	89	45	64	5		9	0.46
131C	42.4	102	51	76	6		9	0.68
131D	48.3	114	57	89	6		9	0.85
131E	60.3	127	64	95	6		9	1.10

## 132 RAILING BASE FLANGE



A structural base plate for all applications of vertical posts. In guardrails the fitting should be positioned with the base holes at 90° to the line of the guardrails to give maximum strength.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
132A	26.9	114	76	76	65	8	11	0.65
132B	33.7	126	76	89	63	10	11	0.59
132C	42.4	140	89	102	75	10	14	1.00
132D	48.3	152	107	114	90	10	14	1.35
132E	60.3	165	128	127	100	10	18	1.80

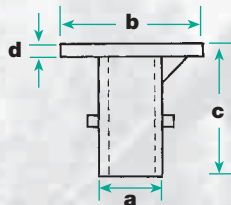
## 133 PLASTIC END CAP



Plastic end cap to seal the end of open tubes. This fitting is only a friction fit. For a permanent fix, a suitable adhesive should be used.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
133A	26.9							0.008
133B	33.7							0.010
133C	42.4							0.010
133D	48.3							0.016
133E	60.3							0.024

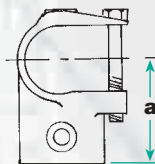
## 134 GROUND SOCKET



Typical use is as a base for a removable upright that can be removed without leaving obstructions. The tube is held in place by the setscrew. The casting hole should be a minimum 300mm x 300mm x 300mm.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
134B	33.7	60	140	130	8			2.00
134C	42.4	60	140	130	8			1.98
134D	48.3	60	140	130	8			1.96

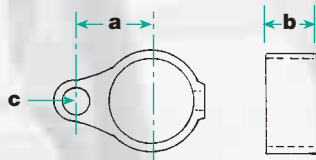
## 135 CLAMP ON TEE



Typical use is for adding to an existing inline structure without having to dismantle the original structure.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
135A	26.9	50						0.35
135B	33.7	53						0.45
135C	42.4	67						0.65
135D	48.3	77						0.70
135E	60.3	90						1.20

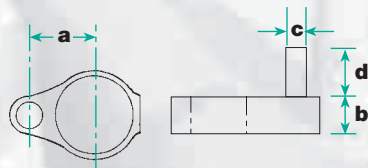
## 138 GATE EYE



Female section of a two part gate hinge. Normally used in conjunction with the 140 fitting. For heavy or wide gates use a 147,101 & 179 to construct the gate hinge. (See page 14 for details).

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
138A	26.9	30	25	15				0.21
138B	33.7	33	25	15				0.23
138C	42.4	38	25	15				0.25
138D	48.3	41	25	15				0.29

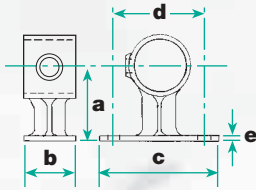
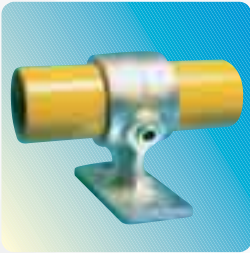
## 140 GATE HINGE



Male section of a two part gate hinge. Normally used in conjunction with the 138 fitting. For heavy or wide gates use a 147,101 & 179 to construct the gate hinge. (See page 14 for details).

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
140A	26.9	30	25	13	38			0.24
140B	33.7	33	25	13	38			0.27
140C	42.4	38	25	13	38			0.30
140D	48.3	41	25	13	38			0.33

## 143 HANDRAIL BRACKET

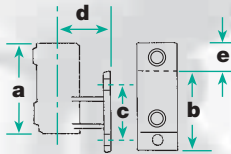
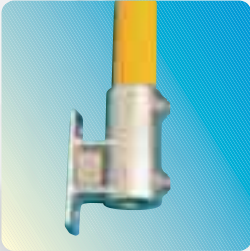


Typical use is a wall mounting handrail bracket, this fitting can also be used to hold in place kicking flats on guardrails or display board on exhibition displays.

**THIS FITTING IS NOT TO BE USED AS A BASE PLATE FOR GUARDRAILS OR DEPENDANT STRUCTURES.**

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
143A	26.9	55	44	78	57	5	8	0.45
143B	33.7	57	44	82	63	6	10	0.49
143C	42.4	63	44	102	76	6	10	0.60
143D	48.3	67	48	108	85	6	10	0.68

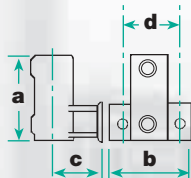
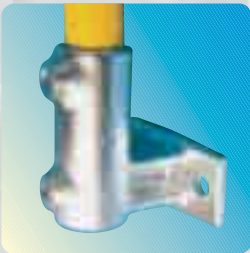
## 144 RAILING SIDE SUPPORT (VERTICAL)



Typical use is as an offset structural side palm fixing for either straight or sloping guardrails. The tube is unable to pass through the standard fitting, should this be required then the base must be reamed out.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
144B	33.7	104	96	67	65	30	14	0.91
144C	42.4	114	109	73	65	30	14	1.20
144D	48.3	120	123	89	65	28	14	1.50

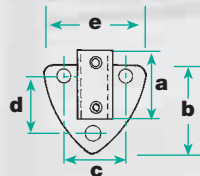
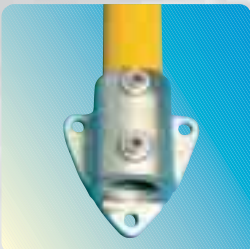
## 145 RAILING SIDE SUPPORT (HORIZONTAL)



Typical use is as a non-structural side palm fixing similar to the 144. The tube is unable to pass through the standard fitting, should this be required then the base must be reamed out.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
145B	33.7	104	98	65	65		14	0.95

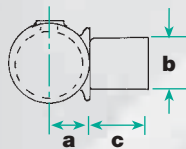
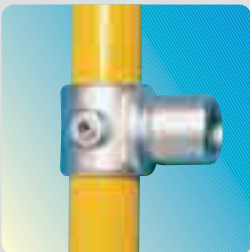
## 146 SIDE PALM FIXING



Typical use is as a side palm fixing for the upright on either straight or sloping guardrails keeping the upright as close as possible to the slope or stairs. The tube is unable to pass through the standard fitting, should this be required then the base must be reamed out.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
146B	33.7	76	88	71	63	96	11	0.65
146C	42.4	84	97	82	72	108	11	0.82
146D	48.3	90	105	86	78	110	11	0.93

## 147 INTERNAL SWIVEL TEE



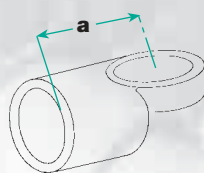
Typical use is for offset variable angle sloping guardrails used in conjunction normally with a 101 fitting. This fitting eliminates the need for specialised angle fittings such as the 126 or 127.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
147B	33.7	23	34	34				0.39
147C	42.4	29	42	40				0.58
147D	48.3	31	48	45				0.66

## 148 SHORT SWIVEL TEE



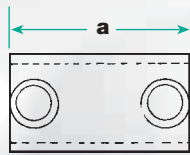
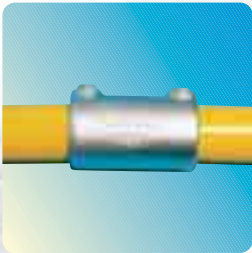
**THIS SHOWS TWO FITTINGS**



Typical use is on level guardrails to create a corner at other than 90° with an upright. Creates angles on plan between 85° & 235°. When using the 148 fitting the top of the upright needs to be closed using a 133 end cap.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
148A	26.9	58						0.31
148B	33.7	58						0.32
148C	42.4	73						0.54
148D	48.3	81						0.66
148E	60.3	110						1.14

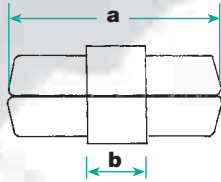
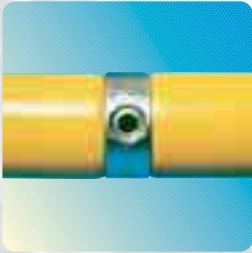
## 149 SLEEVE JOINT



TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
149A	26.9	76						0.33
149B	33.7	89						0.47
149C	42.4	102						0.64
149D	48.3	102						0.72
149E	60.3	120						1.14

Inline external connector for joining two tubes together in a run. For an inline joint that is the same diameter as the tube the 150 fitting should be used. Not recommended as structural joint.

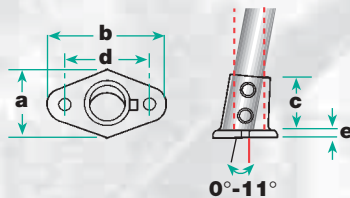
## 150 INTERNAL JOINT



TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
150B	33.7	80	20					0.30
150C	42.4	80	20					0.43
150D	48.3	80	20					0.58

In-line connector for joining two tubes together using medium gauge tube. It must never be used as a load bearing joint. *a structural joint.*

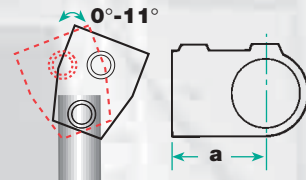
## 152 BASE FLANGE 0° - 11°



TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
152D	48.3	96	152	90	114	10	14	1.40

Typical use is a structural base for sloping guardrails between 0° and 11° enabling the upright to remain vertical.

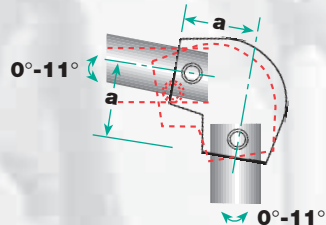
## 153 SHORT TEE 0° - 11°



TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
153D	48.3	67						0.76

Typical use is on shallow sloping guardrails between 0° and 11° to connect the upright to the top rail or the end or mid rail to the upright. Tubes cannot be joined inside this fitting use the 155 fitting. Normally used in conjunction with the 154 fitting.

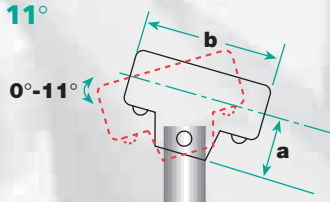
## 154 ELBOW 0° - 11°



TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
154D	48.3	67						1.02

Typical use is on shallow sloping guardrails between 0° and 11° at the start or end of a run to connect the top rail to the upright. This fitting can be used at either the bottom or top of an incline. Normally used in conjunction with the 153 fitting.

## 155 LONG TEE 0° - 11°

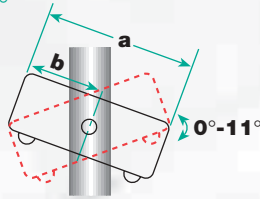
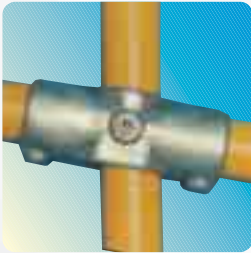


TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
155D	48.3	67	158					1.34

Typical use is on shallow sloping guardrails between 0° and 11° to connect the vertical to the top rail. Tubes can be joined inside a 155. Normally used in conjunction with the 156 fitting.

# tubeclamps™

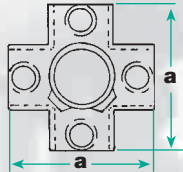
## 156 2 SOCKET CROSS 0° - 11°



Typical use is on shallow sloping guardrails between 0° and 11° to connect the mid or lower rails to the vertical. The vertical must remain continuous with the cross rails cut. Normally used in conjunction with the 155 fitting.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
156D	48.3	158	79					1.00

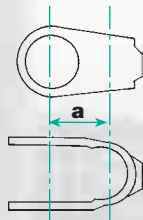
## 158 4 WAY CROSS



A four way cross for joining tubes together in the centre of a structure. The fitting allows the upright to pass through the centre with the cross rails joining at 90° to the upright.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
158A	26.9	41						0.60
158B	33.7	48						0.84
158C	42.4	60						1.21
158D	48.3	67						1.60
158E	60.3	86						2.50

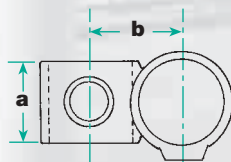
## 160 CLAMP ON CROSSOVER



Typical use is for adding to an existing offset structure without having to dismantle the original structure.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
160A	26.9	27						0.18
160B	33.7	34						0.30
160C	42.4	43						0.47
160D	48.3	49						0.65
160E	60.3	61						0.81

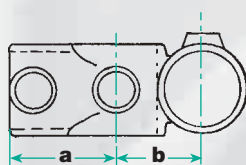
## 161 90° CROSSOVER



Typical use is for racking systems or offset guardrails. Tubes cannot be joined inside this fitting.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
161A	26.9	36	35					0.20
161B	33.7	38	40					0.36
161C	42.4	45	50					0.55
161D	48.3	51	56					0.71
161E	60.3	61	64					1.06
161B/C	33.7/42.4	45	45					0.46
161B/D	33.7/48.3	51	48					0.50
161D/C	48.3/42.4	51	52					0.59

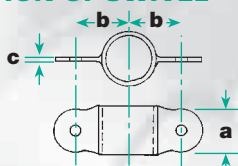
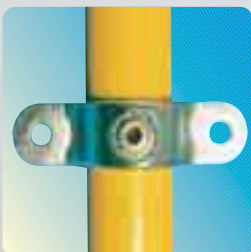
## 165 COMBINATION SOCKET



A combination fitting typically used for the construction of pallet racking or shelved racking systems. Tubes cannot be joined inside this fitting.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
165A	26.9	40	35					0.30
165B	33.7	48	40					0.57
165C	42.4	60	50					0.79
165D	48.3	67	56					0.96
165E	60.3	86	68					1.65

## 167M DOUBLE MALE SECTION OF SWIVEL



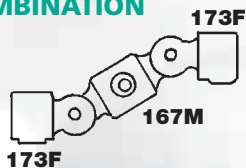
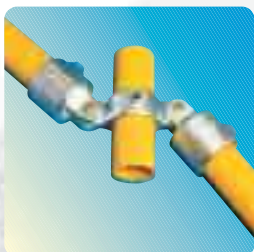
**THIS FITTING IS NOT DESIGNED TO WITHSTAND LATERAL LOADINGS**

Double male fitting with the connection lugs at 180° to each other. This fitting can also be used to retain display panels etc. in place.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
167AM	26.9	32	38	8				0.27
167BM	33.7	32	42	8				0.28
167CM	42.4	32	47	8				0.34
167DM	48.3	32	50	8				0.35
167EM	60.3	50	56	8				0.63



## 167 DOUBLE SWIVEL COMBINATION



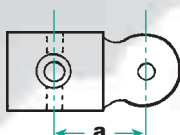
**THIS FITTING IS NOT DESIGNED TO WITHSTAND LATERAL LOADINGS**

Double in line swivel connector. Typical use is on sloping guardrails. This fitting combines 1 x 167M & 2 x 173F. The swivels can travel in approximately 85° from the horizontal in both vertical directions.

**AN ENTIRE STRUCTURE SHOULD NOT BE BUILT USING SWIVEL FITTINGS ONLY**

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
167A	26.9							0.90
167B	33.7							1.06
167C	42.4							1.25
167D	48.3							1.45
167E	60.3							2.50

## 168M 90° CORNER SWIVEL MALE SECTION

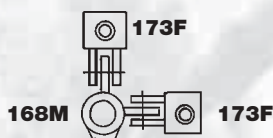


**THIS FITTING IS NOT DESIGNED TO WITHSTAND LATERAL LOADINGS**

Double male fitting with the connection lugs at 90° to each other. This fitting can also be used to retain display panels etc. in place.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
168AM	26.9	38						0.28
168BM	33.7	42						0.30
168CM	42.4	47						0.34
168DM	48.3	50						0.38

## 168 90° CORNER SWIVEL COMBINATION



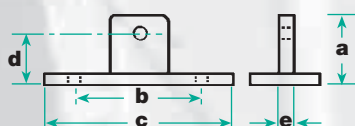
**THIS FITTING IS NOT DESIGNED TO WITHSTAND LATERAL LOADINGS**

Double corner swivel connector. Typical use is on sloping guardrails. This fitting combines 1 x 168M & 2 x 173F. The swivels can travel in approximately 85° from the horizontal in both vertical directions.

**AN ENTIRE STRUCTURE SHOULD NOT BE BUILT USING SWIVEL FITTINGS ONLY**

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
168A	26.9							0.90
168B	33.7							1.06
168C	42.4							1.29
168D	48.3							1.50

## 169M SWIVEL BASE SECTION

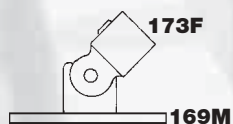


**THIS FITTING IS NOT DESIGNED TO WITHSTAND LATERAL LOADINGS**

Non structural male locating base, typically used to create a swivel base.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
169M		50	81	111	40	8	11	0.35

## 169 SWIVEL BASE THIS IS NOT A STRUCTURAL FITTING



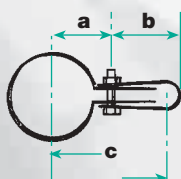
**THIS FITTING IS NOT DESIGNED TO WITHSTAND LATERAL LOADINGS**

Non structural male locating swivel. This fitting combines 1 x 169M plus 1 x 173F. The swivel can travel in approximately 85° from the horizontal in both vertical directions.

**THIS FITTING IS NOT TO BE USED AS A BASE PLATE FOR GUARDRAILS OR DEPENDANT STRUCTURES.**

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
169A	26.9						11	0.64
169B	33.7						11	0.77
169C	42.4						11	0.87
169D	48.3						11	0.98
169E	60.3						11	1.29

## 170 MESH PANEL CLIP SINGLE

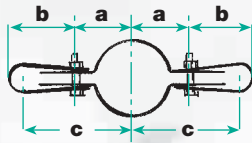


Single mesh panel clip. Typical use is for retaining weldmesh panels into guardrails. To correctly retain the weldmesh panel using this clip the panel should be framed with an 8mm bar.

Note - Dimension C can be increased by up to 10mm.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
170A	26.9	27	26	58				0.06
170B	33.7	30	26	61				0.07
170C	42.4	33	26	64				0.08
170D	48.3	38	26	68				0.09
170E	60.3	44	26	75				0.09

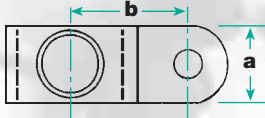
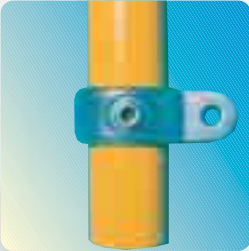
## 171 MESH PANEL CLIP DOUBLE



Double mesh panel clip. Typical use is for retaining weldmesh panels into guardrails. To correctly retain the weldmesh panel using this clip the panel should be framed with an 8mm bar.  
Note - Dimension C can be increased by up to 10mm.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
171A	26.9	27	26	58				0.09
171B	33.7	30	26	61				0.12
171C	42.4	33	26	64				0.13
171D	48.3	38	26	68				0.13
171E	60.3	44	26	75				0.14

## 173M SINGLE MALE SECTION OF SWIVEL

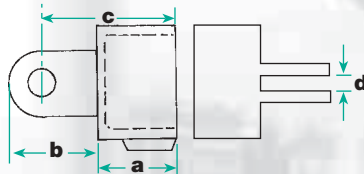
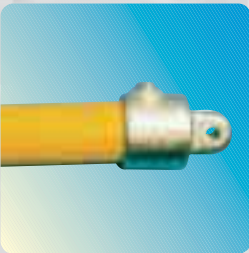


**THIS FITTING IS NOT DESIGNED TO WITHSTAND LATERAL LOADINGS**

Single male fitting with one connection lug. This fitting can also be used to retain display panels etc. in place. The swivel can travel in approximately 85° from the horizontal in both vertical directions.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
173AM	26.9	32	38					0.21
173BM	33.7	32	42					0.22
173CM	42.4	32	47					0.28
173DM	48.3	32	50					0.29
173EM	60.3	48	60					0.53

## 173F FEMALE SECTION OF SWIVEL

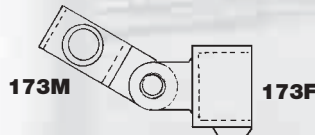


**THIS FITTING IS NOT DESIGNED TO WITHSTAND LATERAL LOADINGS**

Female section used in conjunction with the male fittings (167M, 168M, 169M & 173M)

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
173AF	26.9	28	35	58	10			0.25
173BF	33.7	35	35	60	10			0.38
173CF	42.4	38	35	64	10			0.46
173DF	48.3	44	35	70	10			0.52
173EF	60.3	60	40	95	10			0.93

## 173 SINGLE SWIVEL COMBINATION



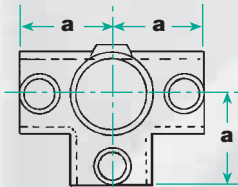
**THIS FITTING IS NOT DESIGNED TO WITHSTAND LATERAL LOADINGS**

Single in-line swivel connector. Typical use is on sloping guardrails. This fitting combines 1 x 173M & 1 x 173F.

**AN ENTIRE STRUCTURE SHOULD NOT BE BUILT USING SWIVEL FITTINGS ONLY**

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
173A	26.9							0.55
173B	33.7							0.60
173C	42.4							0.74
173D	48.3							0.86
173E	60.3							1.47

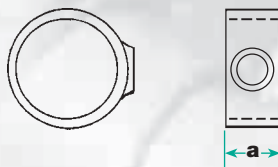
## 176 SIDE OUTLET TEE



Typical use would be for constructing market stalls, or play frame structures.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
176A	26.9	40						0.42
176B	33.7	48						0.49
176C	42.4	60						0.94
176D	48.3	67						1.15
176E	60.3	86						1.90

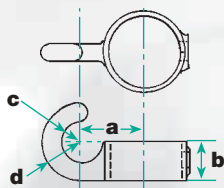
## 179 LOCKING COLLAR



Typical use is as a locking collar or as additional strength to fittings on high load structures.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
179A	26.9	22						0.15
179B	33.7	25						0.15
179C	42.4	25						0.18
179D	48.3	25						0.21
179E	60.3	40						0.31

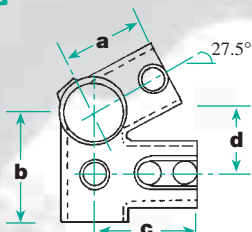
## 182 HOOK



A chain hook. This is not recommended as a permanent chain location, for permanent chain locations one end should be retained using a 173M fitting and fixed using a nut & bolt.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
182A	26.9	32	25	10	25			0.17
182B	33.7	34	25	13	25			0.25
182C	42.4	39	25	13	25			0.25
182D	48.3	41	25	13	25			0.30

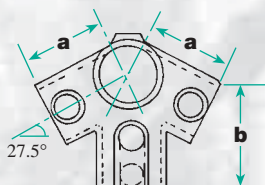
## 185 27½° EAVES FITTING



Typical use is for the eaves end of a roof system used in conjunction with fitting 191.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
185D	48.3	67	89	83	51			1.82

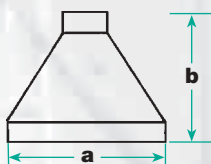
## 191 27½° RIDGE FITTING



Typical use is for the ridge of a roof system used in conjunction with fitting 185.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
191D	48.3	67	89					1.32

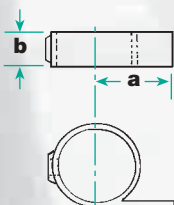
## 192 WEATHER SHIELD



Typical use is for weather protection around a 132 fitting on flat roof guardrails systems. This fitting needs to be sealed with a suitable sealant. For installation process see page 14.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
192B	33.7	140	125					0.25
192C	42.4	150	150					0.30
192D	48.3	166	150					0.35

## 199 FIXING BRACKET



Typical use is for fixing panels, display boards or flooring to structures. The fitting is supplied blank, a hole upto 12mm can be drilled if required into the flat.

TYPE	TUBE SIZE	a	b	c	d	e	Ø	Kg
199D	48.3	53	40					0.37

## 231 EXTRA SET SCREWS



TYPE	TUBE SIZE
231A	1/4" BSP SHORT
231BC	1/4" BSP
231DE	3/8" BSP

Deltatone™ coated, case hardened set screws. N.B. The set screw when tightened to a torque of 39 Nm, gives a slipload of 900Kg to a safety factor of 2.

## 232 HEXAGON KEY



TYPE	TUBE SIZE
232ABC	1/4" A/F
232DE	5/16" A/F

A/F = ACROSS FLAT

Hexagonal Allen key. This is the only tool required to tighten up a setscrew.

## 233 DUAL RATCHET



TYPE	TUBE SIZE
233ABC	1/4" A/F
233DE	5/16" A/F

A/F = ACROSS FLAT

Dual head ratchet key. The ratchet is supplied with 2 removable hexagon heads to enable all setscrews to be tightened to the correct torque.

## GUIDE TO GUARDRAIL BAY SIZES (DIMENSIONS ARE UPRIGHT CENTRES)

The below dimensions are for guidance only and are not intended to be used as an authorised specification dimension.

TYPE SIZE	SIZE B	SIZE C		SIZE D			SIZE E	
O/D	33.7	42.4	42.4	48.3	48.3	48.3	60.2	60.2
Wall in mm	3.2	3.2	4.0	3.2	4.0	5.0	3.65	4.5
Design Load n/M	Guardrail Height: - 900mm High							
360	925	1560	1820	2085	2445	3700	3720	4395
740	445	760	885	1015	1190	2250	1810	2140
Design Load n/M	Guardrail Height: - 1100mm High							
360	760	1275	1485	1705	2000	3700	3045	3595
740	365	620	725	830	970	1840	1480	1750
1500	180	300	355	405	480	900	730	860

Crossrails are 3.2mm wall thick tube. The above is based on the maximum permissible bending moment of the tube.

Design load examples: 360 n/M - Shopping trolley bays, Handrails, Machine protection guardrails, Directional rails

740 n/M - Pedestrian guardrails, Roof guardrails, fire escapes

These are examples only.

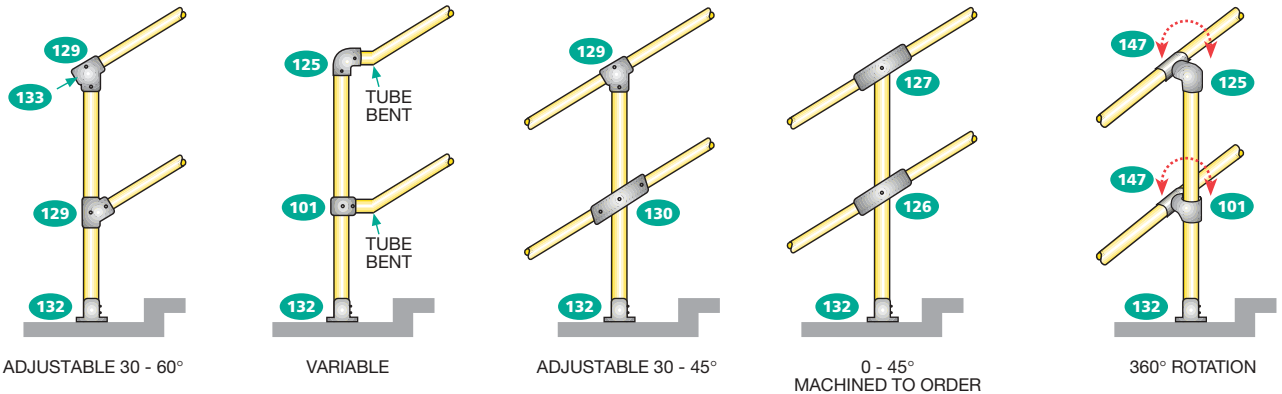
Specific design loads

should be confirmed.

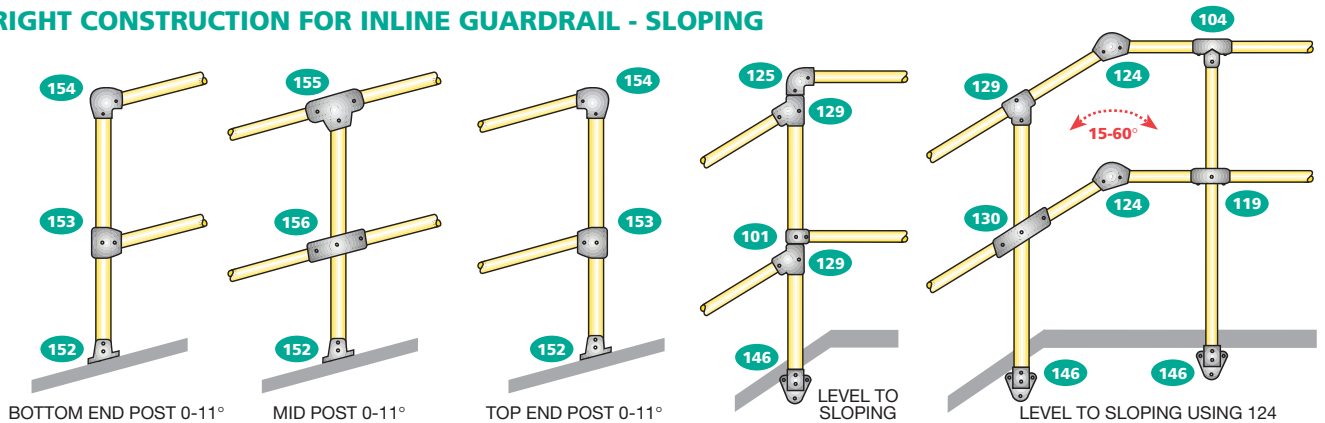
1500 n/M - Football stadia, high level public access areas in shopping malls etc

For details and dimensions on base fixings, refer to Page 14.

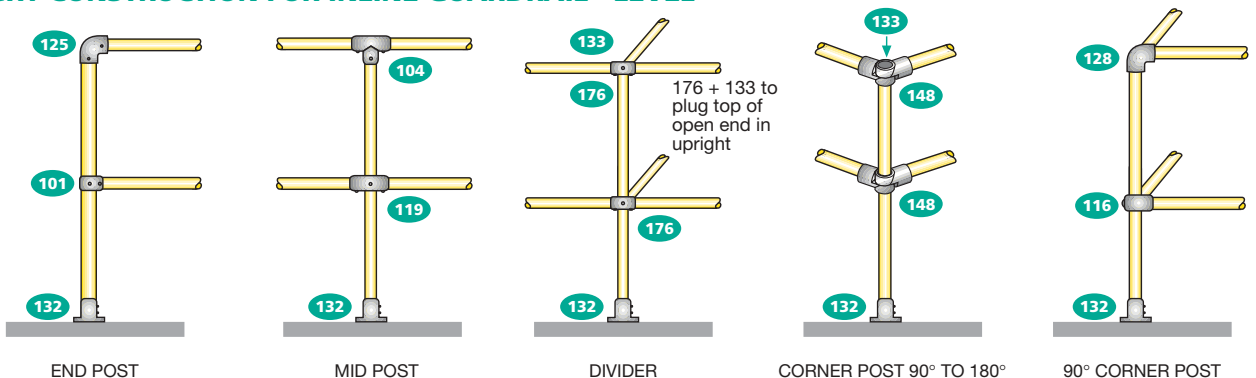
### UPRIGHT CONSTRUCTION FOR INLINE GUARDRAIL - SLOPING



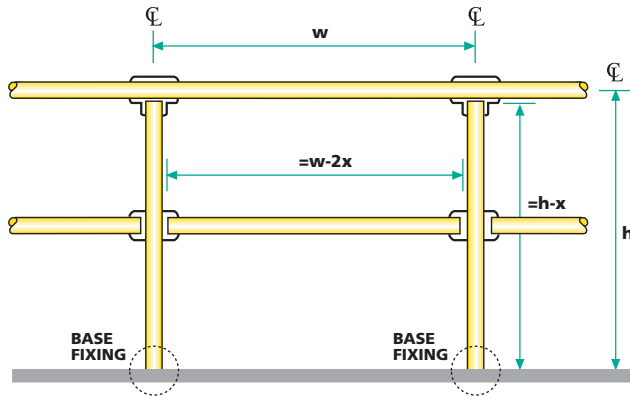
### UPRIGHT CONSTRUCTION FOR INLINE GUARDRAIL - SLOPING



### UPRIGHT CONSTRUCTION FOR INLINE GUARDRAIL - LEVEL



For details and dimensions on base fixings, refer to Page 14.  
**HOW TO CALCULATE CORRECT TUBE LENGTH - LEVEL**



$w$  = Distance between uprights  $\ell$  to  $\ell$

$h$  = Height of upright ground level to  $\ell$  top rail

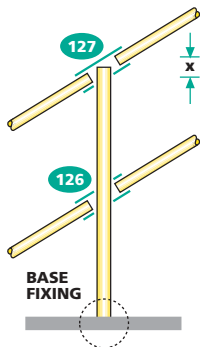
Upright height =  $h - x$   
 Cross rail =  $w - 2x$

### CUTTING CHART

SIZE	x
a	14
b	17
c	22
d	25
e	30

## HOW TO CALCULATE CORRECT TUBE LENGTH - SLOPING

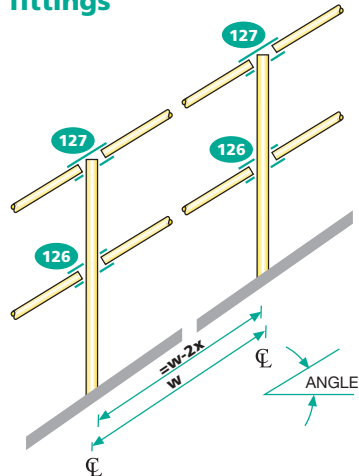
### 126 & 127 fittings



Add dimension 'x' to the upright height.

#### DIMENSION 'x'

	b	c	d
0°	19	22	25
5°	16	19	22
10°	16	16	19
15°	13	16	19
20°	13	13	16
25°	9	13	16
30°	9	13	13
35°	9	9	13
40°	6	9	9
45°	6	6	9

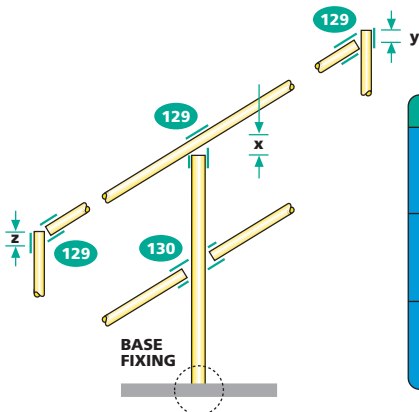


Subtract 2 x dim 'x' from the upright centres.  
 The upright centres must be measured on the slope.

#### DIMENSION 'x'

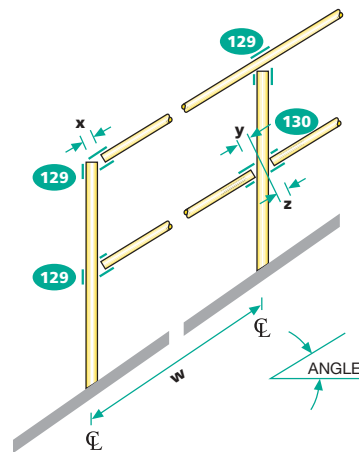
	b	c	d
0°	19	23	26
5°	22	25	29
10°	25	29	33
15°	25	33	35
20°	29	33	38
25°	33	35	42
30°	35	42	45
35°	39	45	52
40°	42	49	57
45°	48	55	64

### 129 & 130 fittings



Select the orientation for 129 fitting.  
 Add or subtract the relevant dimension.

	30°	35°	40°	45°	
b	x	-34	-34	-37	-43
	y	+24	+18	+11	+3
	z	+36	+42	+49	+58
c	x	-40	-44	-48	-54
	y	+29	+21	+12	+3
	z	+44	+52	+61	+71
d	x	-45	-50	-55	-61
	y	+33	+24	+14	+3
	z	+46	+55	+65	+77

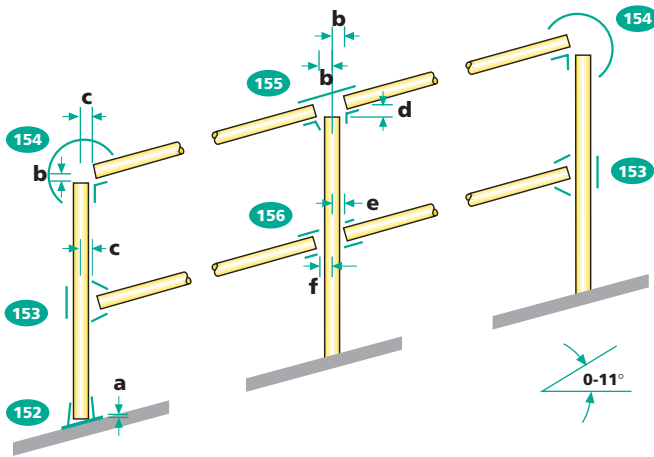


Subtract the relevant dimensions from the upright centres.  
 The upright centres must be measured on the slope.

	30°	35°	40°	45°	
b	x	32	34	37	44
	y	55	51	48	46
	z	36	40	43	46
c	x	40	45	49	55
	y	64	61	57	54
	z	41	45	49	53
d	x	46	51	56	61
	y	78	74	64	65
	z	55	58	61	66

## HOW TO CALCULATE CORRECT TUBE LENGTH - SLOPING

### 0 - 11° SLOPE FITTINGS



**CUTTING CHART**

SIZE	
a	7
b	25
c	28
d	28
e	28
f	35

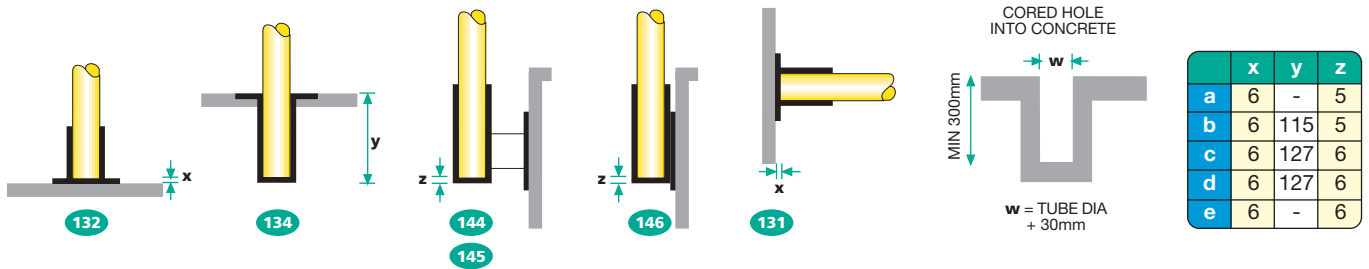
#### Upright

Calculating the upright height - select the top rail fitting (153, 154, 155). Subtract the relevant dimension from the upright length. Add or subtract the dimension for the ground fitting being used.

#### Crossrail

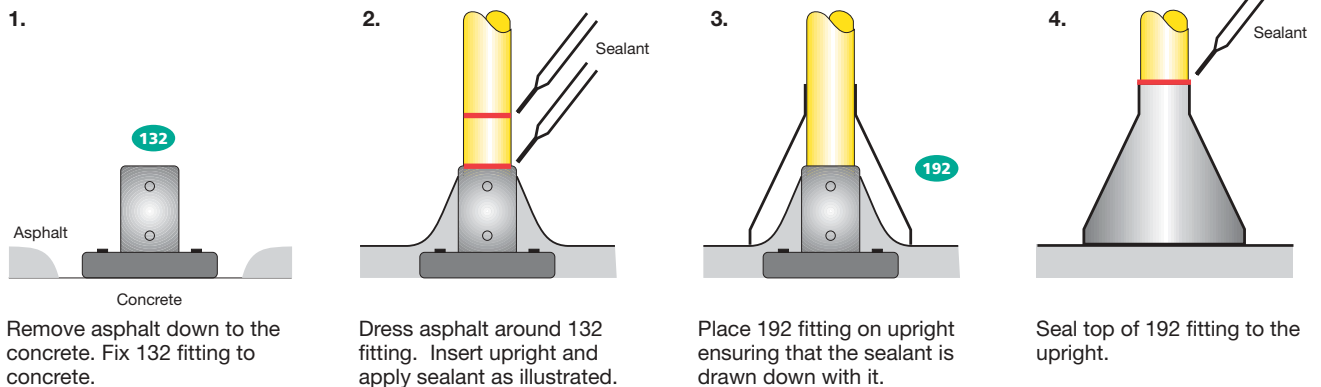
Calculating the crossrail width - select the fittings to be used and subtract the relevant dimension from the upright centres. The upright centres must be measured on the slope.

## CUTTING DIMENSIONS FOR BASE AND WALL PLATES



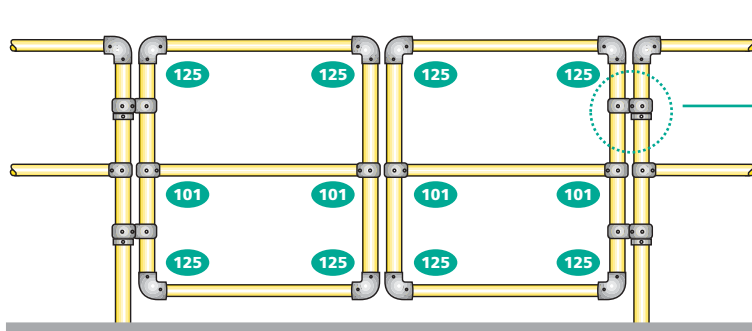
Dimensions x and z subtract from upright length. Dimension y added to upright length. Uprights cast into concrete pockets must be flat on one end and the hole min 300mm x 300mm x 300mm.

## 192 WEATHER FLANGE INSTALLATION PROCESS



## GATE CONSTRUCTION

### HEAVY DUTY GATE HINGE



- Tighten the grub screw on the 147 to the gate.
- Tighten the grub screw on the 101 to the 147.
- Tighten the grub screw on the 179 to the upright.
- Leave the grub screw on the 101 to the upright loose.

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## APPLICATIONS



GUARDRAIL



RACKING



DISPLAY STRUCTURES



HANDRAIL

## OTHER EXAMPLES

- AWNINGS & CARPORTS
- SUPPORT STRUCTURES
- CHILDREN'S PLAY EQUIPMENT
- MARKET STALLS
- EXHIBITION STANDS
- TEMPORARY BUILDINGS
- LIGHTING GRIDS
- PALLET OR GARMENT RACKING
- BENCHES
- SHOPPING TROLLEY BAYS

*and many more besides*

**"the fitting solution"™**

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