

# CROSCO

## GALVANISED HANDRAIL



TECHINICAL GUIDE  
FITTINGS

# VERSATILE AND DURABLE







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## DISCLAIMER

Although every effort is made to ensure the information in this brochure is correct at the time of printing, no responsibility can be accepted for any errors or omissions. The information provided is only to be used as a guide, no responsibility will be accepted for any errors or changes in dimensions from our suppliers.

# INTRODUCTION

## THE **SAFE CLAMPING SYSTEM** FOR CIRCULAR HOLLOW SECTION TUBE

Crosco has a range of fittings manufactured from Malleable Iron to BS EN 1562 or Ductile Iron (where noted in the fittings description) to BS EN 1563 .

These fittings are used to construct lightweight tubular steel structures and are manufactured to suit five different tube sizes.

Crosco Handrail fittings require no welding, drilling or special tools, simply use a hexagon key to tighten the special setscrews that embed into the tube. The fittings will support an axial load of up to 900 kg when tightened to a torque of 39Nm.

### FINISHES AVAILABLE

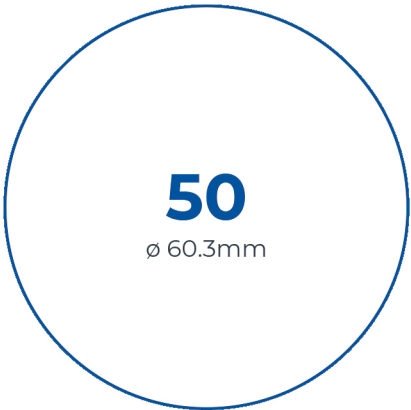
The castings are Hot dip Galvanised to BS EN ISO 1461 as standard. These fittings can also be supplied in a powder coated finish to RAL standard colours, subject to quantity and availability from the coaters.

### SIZING

Crosco fittings are suitable for use with steel tubes to BS EN 10255 with a minimum wall thickness of 3.2mm, however please note that internal fitting types: C01, C06, C65, DDA-02 & DDA-06 are only designed for use with 3.2mm thick tube.

Fitting	Tube Size ø	Nominal bore of tube	
		Metric	Imperial
20	26.9mm	20	¾"
25	33.7mm	25	1"
32	42.4mm	32	1 ¼"
40	48.3mm	40	1 ½"
50	60.3mm	50	2"

**Important Note:** The Tube Size Ø should be the first consideration as this is the primary structural component for any handrail structure. The application guidelines on the next page will help the design of Racking, General Structures and Handrail.





## RACKING AND GENERAL STRUCTURES

Racking and general structures can be constructed using Croscos fittings. Care must be taken to ensure that the tube size selected is adequate for the loads anticipated. To help with the selection of the correct tube, table 1 provides the uniformly distributed loads that can be supported between upright posts, assuming that the load is supported by two tubes. These loads are calculated based on the maximum bending moment for the tube.

Table 2 provides the load capacity for single upright posts with various unsupported lengths. These loads are based on the compression strength and buckling loads of the circular hollow section (CHS) tube.

NB. When designing structures care must be taken to ensure that the load on any one grub screw does not exceed 900kg.

**TABLE 1: Horizontal tubes load capacity**

Uniformly distributed load in kg using two horizontal tubes

SPAN (M)	TUBE Ø				
	26.9mm x 2.6	33.7mm x 3.2	42.4mm x 3.2	48.3mm x 3.2	60.3mm x 3.6
0.5	540	1060	1750	2380	4000
0.6	435	850	1407	1870	3250
0.7	375	730	1207	1595	2760
0.8	330	645	1063	1385	2420
0.9	295	579	946	1230	2160
1.0	265	525	850	1110	1950
1.1	240	478	770	1013	1775
1.2	219	438	705	930	1625
1.3	202	403	651	858	1497
1.4	187	373	604	796	1387
1.5	175	347	564	741	1290
1.6	-	325	529	693	1205
1.7	-	306	499	650	1129
1.8	-	290	472	613	1061
1.9	-	277	448	581	999
2.0	-	268	427	553	987
2.1	-	-	408	528	944
2.2	-	-	391	505	855
2.3	-	-	376	485	818
2.4	-	-	362	467	785
2.5	-	-	349	450	755
2.6	-	-	-	434	728
2.7	-	-	-	419	703
2.8	-	-	-	405	680
2.9	-	-	-	-	659
3.0	-	-	-	-	639
3.1	-	-	-	-	620
3.2	-	-	-	-	603
3.3	-	-	-	-	588
3.4	-	-	-	-	575
3.5	-	-	-	-	564

Grade: BS EN 10255 (ISO 65)

**TABLE 2: Vertical load capacity**

Vertical load in kg per strut

LENGTH (m)	TUBE Ø				
	26.9mm x 2.6	33.7mm x 3.2	42.4mm x 3.2	48.3mm x 3.2	60.3mm x 3.6
0.3	1720	2950	4038	4783	7044
0.4	1435	2617	3703	4446	6661
0.5	1150	2284	3368	4109	6278
0.6	910	1951	3033	3772	5895
0.7	725	1618	2690	3435	5512
0.8	590	1348	2363	3098	5129
0.9	480	1128	2028	2761	4746
1.0	-	948	1752	2424	4363
1.1	-	798	1524	2134	3980
1.2	-	-	1340	1884	3597
1.3	-	-	1188	1668	3253
1.4	-	-	1066	1484	2951
1.5	-	-	-	1328	2681
1.6	-	-	-	-	2441
1.7	-	-	-	-	2226
1.8	-	-	-	-	2032
1.9	-	-	-	-	1857
2.0	-	-	-	-	1697

Grade: BS EN 10255 (ISO 65)

### Guardrail

Guardrail is the most common form of structure that is built with these fittings and requires careful consideration to meet required design loadings. Design loads are usually specified, however if unsure BS 6399 and BS 6180 are good reference documents.

The loading capacity of any guardrail structure is determined principally by the diameter, thickness and frequency of its Uprights. The table below contains our recommendations to safely meet the stated design loads based on the maximum permissible bending moment of the Upright tube.

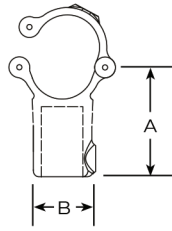
**TABLE 3**

	TUBE Ø					
LENGTH (m)	33.7 x 3.2mm	42.4 x x 3.2mm	42.4 x x 4.0mm	48.3 x 3.2mm	48.3 x 4.0mm	48.3 x 5.0mm
Design Load	Maximum upright centres (mm)					
900mm high						
360 N/m	814	1369	1595	1828	2584	3052
740 N/m	396	666	776	889	1257	2229
1500 N/m	195	329	383	439	620	1100
1000mm high						
360 N/m	732	1232	1435	1645	2326	2930
740 N/m	356	599	698	800	1131	2006
1500 N/m	176	296	345	395	558	990
1100mm high						
360 N/m	666	1120	1305	1496	2114	2778
740 N/m	324	545	635	728	1028	1824
1500 N/m	160	269	313	359	507	900

Grade: BS EN 10255 (ISO 65)  
Rails need only be 3.2mm thick and the same diameter as the Upright.

# FIXED FITTINGS

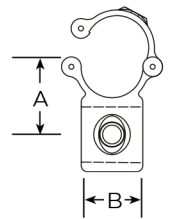
## CA03.101 Add On Short Tee



The Add On short Tee allows existing structures to be added to without the need for any dismantling. Tubes must not be jointed within this fitting.

Type	Tube size	A	B	Kg
16.101.032.000	42.4	60	55	0.60
16.101.040.000	48.3	68	60	0.71

## CA40.161 Add On 90° Crossover

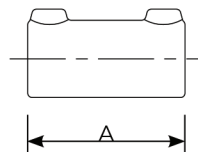


The Add On 90° Crossover allows existing structures to be added to without the need for any dismantling. This fitting is designed to give a 90° offset crossover joint.

Tubes must not be joined within this fitting.

Type	Tube size	A	B	Kg
16.161.032.000	42.4	49	46	0.65
16.161.040.000	48.3	55	50	0.73

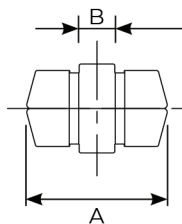
## C00.149 Sleeve Joint



The Sleeve Joint is designed to provide an in-line joint between two tubes of the same diameter.

Type	Tube size	A	Kg
16.149.020.000	26.9	76	0.33
16.149.025.000	33.7	89	0.39
16.149.032.000	42.4	102	0.50
16.149.040.000	48.3	100	0.55
16.149.050.000	60.3	120	1.14

## C01.150 Expanding Connector



The expanding connector is designed to provide an in line joint between tubes of the same diameter, and a wall thickness of 3.2mm. It fits flush with the tube surface and can be located inside other fittings.

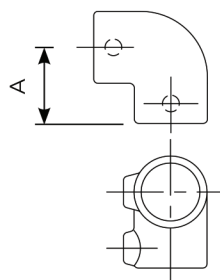


### WARNING!

Inline internal connector for joining two tubes together. Only medium gauge 3.2mm wall thick tube can be used. The 150 should never be used as a load bearing joint. The 150 must be used within 100mm of an upright.

Type	Tube size	A	B	Kg
16.150.025.000	33.7	75	19	0.18
16.150.032.000	42.4	75	19	0.27
16.150.040.000	48.3	75	19	0.35

## C02.125 90° Elbow

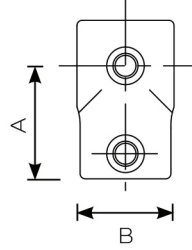


The 90° Elbow is designed to provide a joint between two tubes at right angles to each other. Often used for railing ends and corners.

Type	Tube size	A	Kg
16.125.020.000	26.9	40	0.24
16.125.025.000	33.7	48	0.39
16.125.032.000	42.4	60	0.53
16.125.040.000	48.3	67	0.68
16.125.050.000	60.3	86	1.53



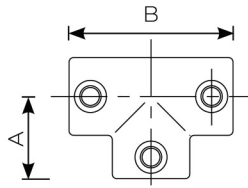
## C03.101 Short Tee



The Short Tee is designed to provide a butt joint between two tubes at right angles to each other. Often used for railing ends and tops. If tubes need to be joined inside the fitting then a C04G type should be used.

Type	Tube size	A	B	Kg
16.101.020.000	26.9	40	38	0.21
16.101.025.000	33.7	48	45	0.35
16.101.032.000	42.4	60	54	0.44
16.101.040.000	48.3	67	60	0.56
16.101.050.000	60.3	86	71	0.76

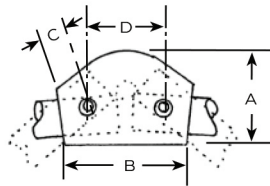
## C04.104 Long Tee



The Long Tee is designed to provide a butt joint between two tubes at right angles to each other. Often used for railing ends and tops. It allows the through tube to be joined inside the fitting. An alternative is the C03G type fitting.

Type	Tube size	A	B	Kg
16.104.020.000	26.9	40	80	0.35
16.104.025.000	33.7	48	96	0.52
16.104.032.000	42.4	60	122	0.77
16.104.040.000	48.3	67	134	0.88
16.104.050.000	60.3	86	172	1.33

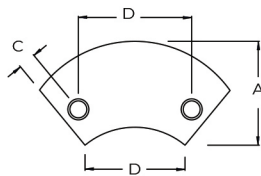
## C05.104 Variable Elbow (15° to 60°)



The Variable Elbow is designed to make joints at an angle of between 15° and 60°.

Type	Tube size	A	B	C	D	Kg
16.124.025.000	33.7	65	60	13	50	0.43
16.124.032.000	42.4	80	66	16	55	0.66
16.124.040.000	48.3	95	75	17	55	0.91

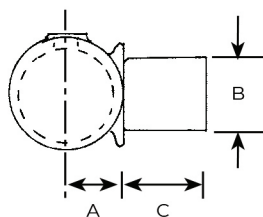
## C05A.124 Variable Elbow (11° to 30°)



The variable elbow is designed to make joints at an angle of between 11° & 30°

Type	Tube size	A	B	C	D	Kg
16.A124.032.000	42.4	84	84	16	92	0.82
16.A124.040.000	48.3	94	94	16	102	1.01

## C06.147 Internal T Joint

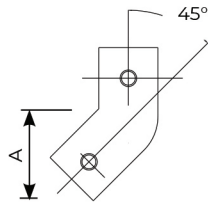


The Internal T joint is designed to provide an angled joint between a tube and a Crosco fitting when used in conjunction with C02G and C03G type fittings. Often used for railing tops and midrails to accommodate a slope as offset railing.

Type	Tube size	A	B	C	Kg
16.147.025.000	33.7	23	33	34	0.33
16.147.032.000	42.4	29	42	40	0.54
16.147.040.000	48.3	31	48	44	0.68

# FIXED FITTINGS

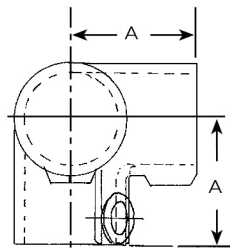
## C07.184 45° Tee



The 45° Tee is used as a bracing and strut component for strengthening structures.

Type	Tube size	A	Kg
16.184.025.000	33.7	45	0.38
16.184.032.000	42.4	54	0.63
16.184.040.000	48.3	60	0.83

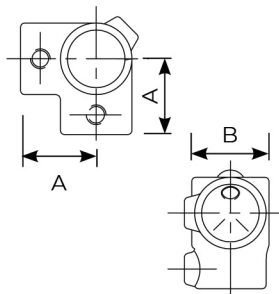
## C20.128 3 Way 90° Elbow



The 3 way 90° Elbow is designed to provide a neat corner for the upper rail of guardrail or frames.

Type	Tube size	A	Kg
16.128.020.000	26.9	40	0.37
16.128.025.000	33.7	48	0.51
16.128.032.000	42.4	60	0.8
16.128.040.000	48.3	67	0.97
16.128.050.000	60.3	84	1.82

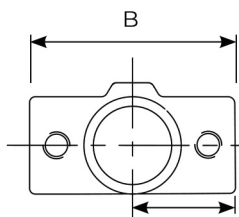
## C21.116 Corner c/w Through Tube



The Corner Complete with through tube is designed to provide a neat corner for the intermediate rail of guardrail or frames.

Type	Tube size	A	B	Kg
16.116.020.000	26.9	40	38	0.21
16.116.025.000	33.7	48	45	0.39
16.116.032.000	42.4	60	54	0.58
16.116.040.000	48.3	67	60	0.69
16.116.050.000	60.3	86	71	1.1

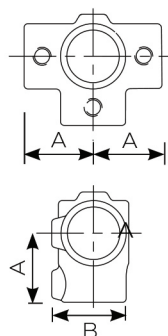
## C22.119 Two Socket Cross



The Two Socket Cross fitting provides the midrail joint for handrail and other structures. It is recommended that the handrail post is continuous through the fitting.

Type	Tube size	A	B	Kg
16.119.020.000	26.9	40	80	0.28
16.119.025.000	33.7	48	95	0.39
16.119.032.000	42.4	60	120	0.57
16.119.040.000	48.3	67	134	0.65
16.119.050.000	60.3	86	172	1.26

## C23.176 Side Outlet Tee

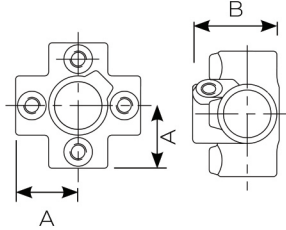


The Side Outlet Tee fitting provides a three way midrail joint for handrail and other structures. It is recommended that the handrail post is continuous through the fitting.

Type	Tube size	A	B	Kg
16.176.020.000	26.9	40	38	0.32
16.176.025.000	33.7	48	45	0.55
16.176.032.000	42.4	60	54	0.83
16.176.040.000	48.3	66	60	0.84
16.176.050.000	60.3	86	71	1.48



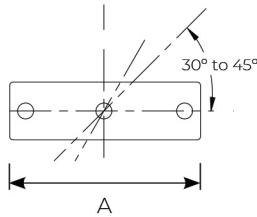
## C24.158 4 Way Cross + Central Tube



The 4 Way Cross fitting provides a four way midrail joint for handrail and other structures. It is recommended that the handrail post is continuous through the fitting. This fitting may also be used for the top rail with the centre post capped with a C65 Plastic Stop End.

Type	Tube size	A	B	Kg
16.158.020.000	26.9	41	59	0.43
16.158.025.000	33.7	48	65	0.75
16.158.032.000	42.4	60	80	1.14
16.158.040.000	48.3	67	85	1.19
16.158.050.000	60.3	86	90	2.12

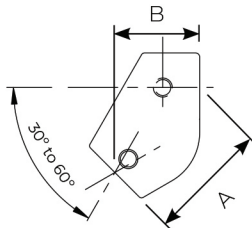
## C28.130 Adjustable 2 Socket Cross (30° to 45°)



The Adjustable 2 Socket Cross fitting will accommodate any rake angle from 30° to 45°. This fitting is not recommended as the top fitting on a guardrail or balustrade system, use the C29 Adjustable Short Tee.

Type	Tube size	A	Kg
16.130.025.000	33.7	162	0.71
16.130.032.000	42.4	190	1.12
16.130.040.000	48.3	218	1.38

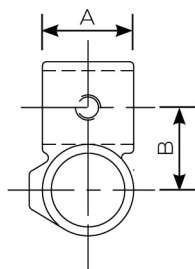
## C29.129 Adjustable Short Tee (30° to 60°)



The Adjustable Short Tee fitting will accommodate any rake angle from 30° to 60°. This fitting is commonly used for the top rail of handrail to accommodate the rake angle on slopes. It can also be used for any Tee Joint to make at an angle of between 30° and 60° for light weight structures.

Type	Tube size	A	B	Kg
16.129.025.000	33.7	74	54	0.47
16.129.032.000	42.4	85	63	0.63
16.129.040.000	48.3	102	108	0.78

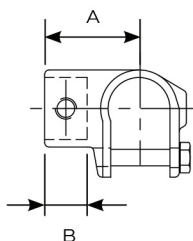
## C40.161 90° Crossover



The 90° Crossover connects two rails at 90° to each other and is often used for the handrailing when continuous standard lengths of tube are used. Please note that tube joints should use the C00 or C01 type fitting, and not the C40 type fitting.

Type	Tube size	A	B	Kg
16.161.020.000	26.9	36	35	0.22
16.161.025.000	33.7	40	40	0.34
16.161.032.000	42.4	49	49	0.41
16.161.040.000	48.3	55	55	0.57
16.161.050.000	60.3	61	64	0.82
16.161.025.032	33.7 / 42.4	45	45	0.46
16.161.025.040	33.7 / 48.3	51	48	0.57
16.161.032.040	42.2 / 48.3	51	52	0.59

## C41.135 Clamp on Tee

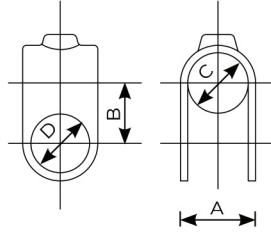


The Clamp on Tee is designed to allow a new tube to be joined to an existing structure. Torque maximum 15N\m. This uses a M10 stainless steel bolt.

Type	Tube size	A	B	Kg
16.135.020.000	26.9	50	25	0.28
16.135.025.000	33.7	53	25	0.45
16.135.032.000	42.4	67	35	0.61
16.135.040.000	48.3	77	35	0.79
16.135.050.000	60.3	90	45	0.97

# FIXED FITTINGS

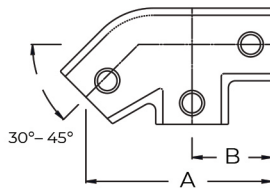
## C42.160 Clamp on Crossover



The Clamp on Crossover is designed to allow a new tube to be joined to an existing structure.

Type	Tube size	A	B	C	D	Kg
16.160.020.000	26.9	37	28	27	27	0.15
16.160.025.000	33.7	44	34	34	34	0.27
16.160.032.000	42.4	53	43	43	43	0.47
16.160.040.000	48.3	58	49	49	49	0.54
16.160.050.000	60.3	70	62	61	61	0.74

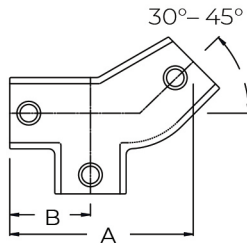
## C041.204 Level to Sloping Down Tee (30° to 45°)



Used to form a Tee on handrails where the rail changes from level to sloping down the stairs. Adjustable between 30° & 45°.

Type	Tube size	A	B	Kg
16.204.032.000	42.4	142	60	1.02
16.204.040.000	48.3	154	68	1.12

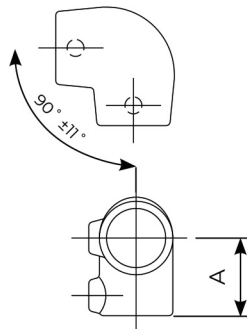
## C042.A204 Level to Sloping Up Tee (30° to 45°)



Used to form a Tee on handrails where the rail changes from level to sloping up the stairs. Adjustable between 30° & 45°.

Type	Tube size	A	B	Kg
16.A204.032.000	42.4	142	60	1.02
16.A204.040.000	48.3	154	68	1.12

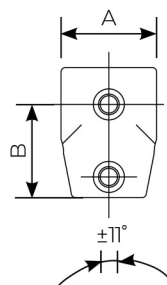
## C50.154 Slope Elbow (0° to 11°)



The Slope Elbow is designed to provide an elbow for use on ramps. The variable angle allows the fitting to accommodate slopes up to 11°.

Type	Tube size	A	Kg
16.154.032.000	42.4	60	0.81
16.154.040.000	48.3	67	1.02

## C51.153 Short Slope Tee (0° to 11°)

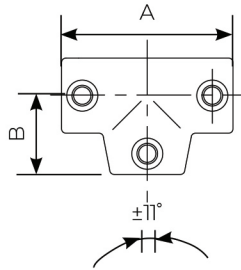


The Slope Short Tee is designed to provide a T joint between two tubes for use on ramps. The variable angle allows the fitting to accommodate slopes up to 11°.

Type	Tube size	A	B	Kg
16.153.032.000	42.4	68	60	0.57
16.153.040.000	48.3	72	68	0.76



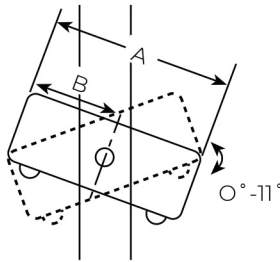
## C52.155 Long Slope Tee (0° to 11°)



The Slope Long Tee is designed to provide a T joint between two tubes for use on ramps. The variable angle allows the fitting to accommodate slopes up to 11°.

Type	Tube size	A	B	Kg
16.155.032.000	42.2	144	60	1.06
16.155.040.000	48.3	158	67	1.10

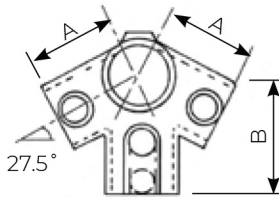
## C54.156 Slope 2 Socket Cross (0° to 11°)



The Slope 2 Socket Cross is designed to provide a joint for the midrail for use on ramps. The variable angle allows the fitting to accommodate slopes up to 11°.

Type	Tube size	A	Kg
16.156.032.000	42.4	144	0.97
16.156.040.000	48.3	158	1

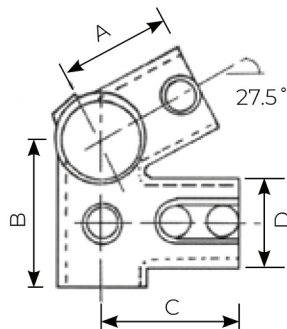
## C55.191 27½° Ridge Fitting



A four way socket fitting used to construct the ridge of a roof structure.

Type	Tube size	A	B	Kg
16.191.040.000	48.3	67	89	1

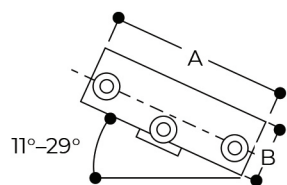
## C56.185 27½° Eaves Fitting



A four way socket fitting used to construct the eaves of a roof structure.

Type	Tube size	A	B	C	D	Kg
16.185.040.000	48.3	67	89	83	51	1.16

## C57.177 Three Socket Tee (11° to 30°)

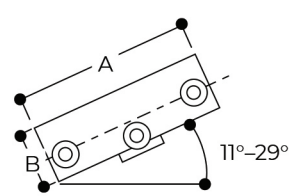


Similar to a type C27, it is used on Safety Railing with slopes between 11°-30° and fixes the top rail to a vertical intermediate upright. Unlike the type C27 these components are ex-stock and do not require machining.

Type	Tube size	A	B	Kg
16.177.032.000	42.4	180	35	1.16
16.177.040.000	48.3	216	40	1.46

# FIXED FITTINGS

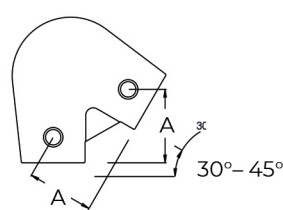
## C58.178 Two Socket Cross (11° to 30°)



Similar to a type C26, it is used on Safety Railing with slopes between 11°-30° and fixes the mid rail to a vertical intermediate upright. Unlike the type C26 these components are ex stock and do not require machining.

Type	Tube size	A	B	Kg
16.178.032.000	42.4	180	55	0.97
16.178.040.000	48.3	216	60	1.26

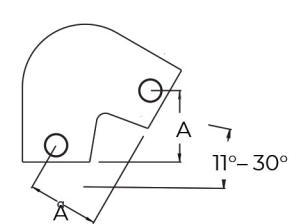
## C72.122 Acute Angle Elbow (30° to 45°)



Used when a junction between a sloping tube and an end post is required i.e guardrail on staircases between 30° & 45°

Type	Tube size	A	Kg
16.122.032.000	42.4	59	0.98
16.122.040.000	48.3	68	1.45

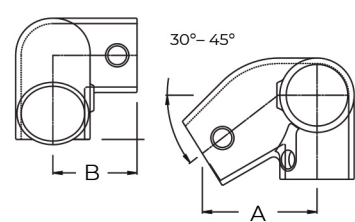
## C72A.A122 Acute Angle Elbow (11° to 30°)



The C72A is used as an alternative to bending, or when a junction between a sloping tube and an end post is required i.e. guardrail on staircases between 11° & 30°

Type	Tube size	A	Kg
16.A122.032.000	42.4	58	0.94
16.A122.040.000	48.3	63	1.12

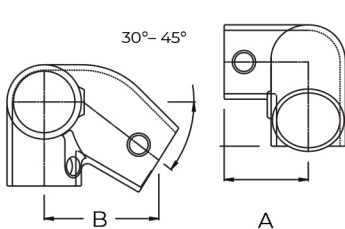
## C201LH.C201 Left Hand Level to sloping down side outlet elbow (30° to 45°)



Used to form a Left Hand Side Outlet Elbow on handrails where the top rail changes from level to sloping down the stairs. Adjustable between 30° & 45°

Type	Tube size	A	B	Kg
16.C201.LH0.032	42.4	86	60	1.08
16.C201.LH0.040	48.3	93	68	1.28

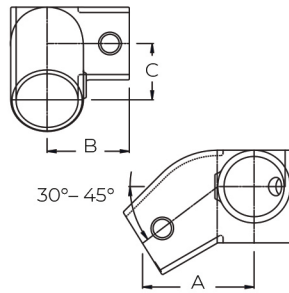
## C201RH.C201 Right Hand Level to sloping down side outlet elbow (30° to 45°)



Used to form a Right Hand Side Outlet Elbow on handrails where the top rail changes from level to sloping down the stairs. Adjustable between 30° & 45°

Type	Tube size	A	B	Kg
16.C201.RH0.032	42.4	86	60	1.08
16.C201.RH0.040	48.3	93	68	1.28

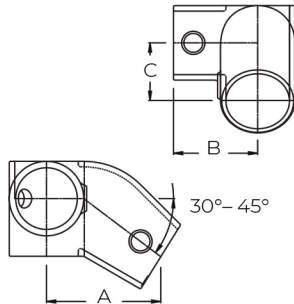
## C211LH.C211 Left Hand Level to sloping down side outlet tee (30° to 45°)



Used to form a Left Hand Side Outlet Tee on handrails where the mid rail changes from level to sloping down the stairs. Adjustable between 30° & 45°

Type	Tube size	A	B	C	Kg
16.C211.LHO.032	42.4	86	60	42	0.96
16.C211.LHO.040	48.3	92	68	47	1.12

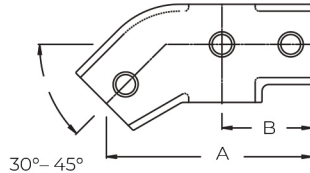
## C211RH.C211 Right Hand Level to sloping down side outlet tee (30° to 45°)



Used to form a Right hand Side Outlet Tee on hand-rails where the mid rail changes from level to sloping down the stairs. Adjustable between 30° & 45°

Type	Tube size	A	B	C	Kg
16.C211.RHO.032	42.4	86	60	42	0.92
16.C211.RHO.040	48.3	92	68	47	1.12

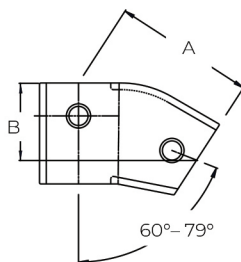
## C221.219 Level to Sloping Down / Up Cross (30° to 45°)



Used to form a cross on handrails where the mid rail changes from either level to sloping down or level to sloping up the stairs. Adjustable between 30° & 45°

Type	Tube size	A	B	Kg
16.219.032.000	42.4	142	60	0.82
16.129.040.000	48.3	154	68	0.95

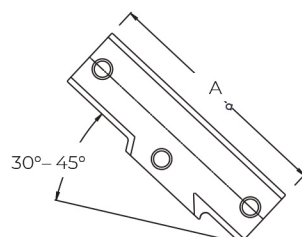
## C229.229 Single Socket Tee (11° to 30°)



The adjustable Short Tee fitting will accommodate any rake angle from 11° to 30°. It can be used for any Tee Joint to make an angle of between 11° & 30°.

Type	Tube size	A	B	Kg
16.229.032.000	42.4	99	54	0.73
16.229.040.000	48.3	109	59	0.86

## C245.277 Three Socket Tee (30° to 45°)



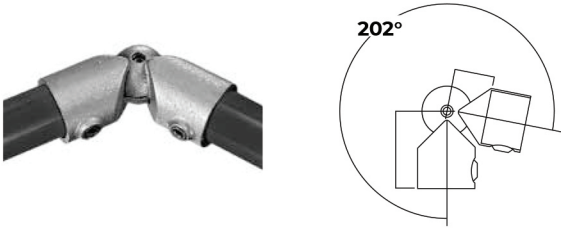
This fitting is used on Safety Railing with slopes between 30° & 45° and fixes the top rail to a vertical intermediate upright

Type	Tube size	A	Kg
16.277.032.000	42.4	180	0.95
16.277.040.000	48.3	216	1.22



# SWIVEL FITTINGS

## BC05.166 Swivel Elbow



Type BC05 fitting has been designed as a variable angle in-line connection, adjustable through 202°.

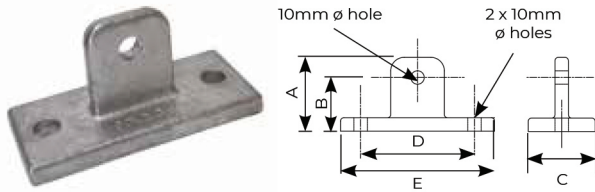


### WARNING!

An entire structure should not be constructed from Type BC05 or any other swivel fitting, as these would not provide sufficient stability or rigidity in the structure due to the free rotation of the fitting.

Type	Tube size	A	B	Kg
16.166.025.000	33.7	60	33	0.51
16.166.032.000	42.4	73	36	0.81
16.166.040.000	48.3	83	45	1.14

## C10G.169M Swivel Base



Designed to provide a base fixing. It is usually used in conjunction with a C36G type fitting to make a C46G type base swivel combination.

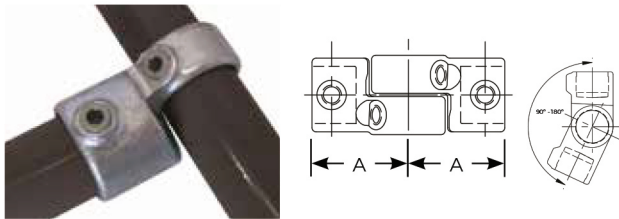
Type	A	B	C	D	E	Kg
16.169M.000.000	50	40	50	81	111	0.51



### WARNING!

This fitting does not provide sufficient rigidity to be used as a railing base without other means of support.

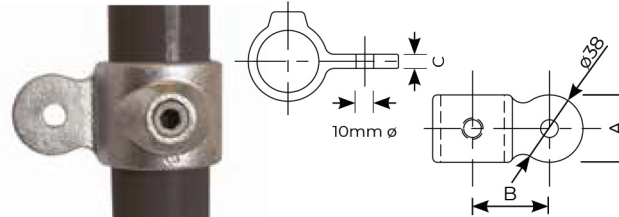
## C25.148 Short Tee Swivel (Normally used in pairs)



Normally used in pairs for corner angles of 90° to 180°. Also used on staircases with C02 & C03 fittings along with a short piece of tube and a C65 Plastic End Cap in landing areas. When ordering please specify the number of fittings required, not the number of pairs.

Type	Tube size	A	Kg
16.148.020.000	26.9	65	0.31
16.148.025.000	33.7	66	0.37
16.148.032.000	42.4	73	0.48
16.148.040.000	48.3	81	0.49
16.148.050.000	60.3	110	0.85

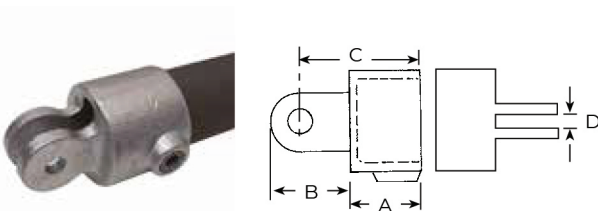
## C35.173M Male Through Swivel



Can be used on its own for use with a shackle and chain or with the C36 female swivel to mount rails at any angle for slopes. It can also be used for attaching flat sheets or boards to a structure and is available assembled with the C36 fittings as a C45 single swivel combination.

Type	Tube size	A	B	C	Kg
16.173M.020.000	26.9	32	38	8	0.15
16.173M.025.000	33.7	32	42	8	0.20
16.173M.032.000	42.4	32	47	8	0.21
16.173M.040.000	48.3	32	50	8	0.24
16.173M.050.000	60.3	48	60	8	0.47

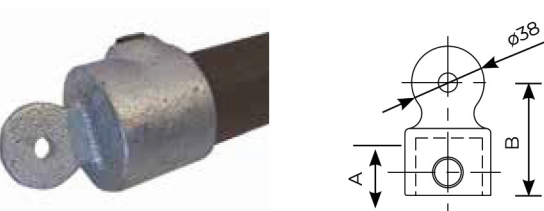
## C36F.173F Female End Swivel



The Female Swivel is designed as part of the swivel combination group of fittings. It can be used with the C10, C35, C37, C38 or C36M male swivel fittings.

Type	Tube size	A	B	C	D	Kg
16.173F.020.000	26.9	39	35	53	10	0.24
16.173F.025.000	33.7	41	35	60	10	0.33
16.173F.032.000	42.4	44	35	63	10	0.38
16.173F.040.000	48.3	50	35	70	10	0.46
16.173F.050.000	60.3	70	40	95	10	0.84

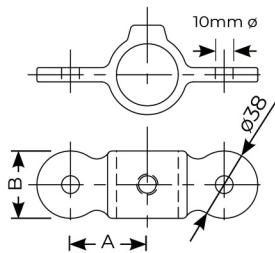
## C36M Male End Swivel



The Male Swivel is designed as part of the swivel combination group of fittings. It can be used with C36F fittings.

Type	Tube size	A	B	Kg
16.C36M.025.000	33.7	30	60	0.28
16.C36M.032.000	42.4	40	70	0.40
16.C36M.040.000	48.3	45	75	0.44

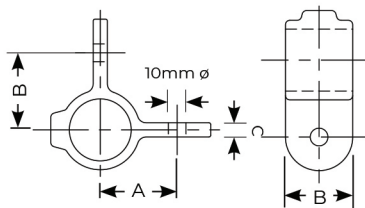
## C37.167M Double Male Swivel



The Double Male Swivel is designed as part of the swivel combination group of fittings. It can be used with two C36 female swivel fittings. The double swivel combination is also available assembled as a type C47 fitting.

Type	Tube size	A	B	Kg
16.167M.020.000	26.9	40	32	0.21
16.167M.025.000	33.7	44	32	0.28
16.167M.032.000	42.4	49	32	0.32
16.167M.040.000	48.3	52	32	0.46
16.167M.050.000	60.3	63	50	0.51

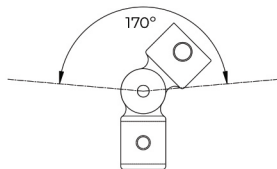
## C38.168M 90° Corner Male Swivel



The 90° Corner Male Swivel is designed as part of the swivel combination group of fittings. It can be used with two C36 female swivel fittings to make a corner combination fitting which is also available assembled as a type C48 type fitting.

Type	Tube size	A	B	C	Kg
16.168M.020.000	26.9	40	39	8	0.22
16.168M.025.000	33.7	44	38	8	0.34
16.168M.032.000	42.4	49	48	8	0.39
16.168M.040.000	48.3	53	48	8	0.47

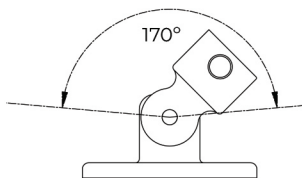
## C45.173 Single Swivel Combination



The Single Swivel Combination is designed to provide an angled tee between two tubes. It can be used to construct sloping handrail and for providing bracing struts to structures.

Type	Tube size	Kg
16.173.020.000	26.9	0.42
16.173.025.000	33.7	0.55
16.173.032.000	42.4	0.62
16.173.040.000	48.3	0.73
16.173.050.000	60.3	1.34

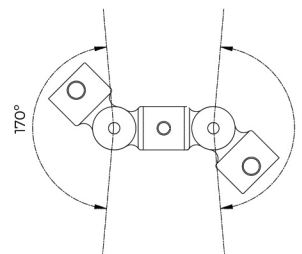
## C46.169 Base Swivel Combination



The Base Swivel Combination is designed to provide an angled wall or floor mounting. This fitting should not be used as a railing base without suitable support.

Type	Tube size	Kg
16.169.020.000	26.9	0.62
16.169.025.000	33.7	0.87
16.169.032.000	42.4	0.81
16.169.040.000	48.3	0.85
16.169.050.000	60.3	0.96

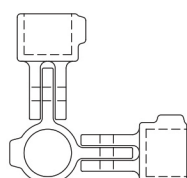
## C47.167 Double Swivel Combination



The Double Swivel Combination is designed to provide an in line angled joint as a post, this is suitable for the mid rail of a sloping handrail or to provide bracing to a structure.

Type	Tube size	Kg
16.167.020.000	26.9	0.78
16.167.025.000	33.7	0.99
16.167.032.000	42.4	0.81
16.167.040.000	48.3	1.32
16.167.050.000	60.3	2.5

## C48.168 90° Corner Swivel Combination

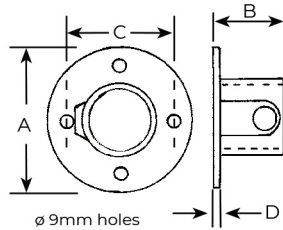


The 90° Corner Swivel Combination is designed to provide an angled joint at a post, this is suitable for the mid rail of sloping handrail or to provide bracing to a structure.

Type	Tube size	Kg
16.168.020.000	26.9	0.75
16.168.025.000	33.7	1.0
16.168.032.000	42.4	1.12
16.168.040.000	48.3	1.46

# FIXINGS & ANCILLARIES

## C11.131 Wall Flange

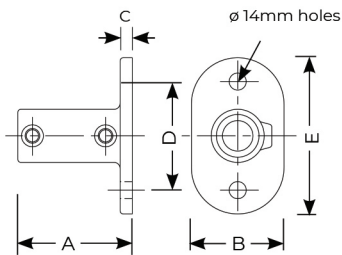


The Wall Flange is designed to provide a positional wall or base fixing.

It is not recommended to use this fitting as a structural railing base.

Type	Tube size	A	B	C	D	Kg
16.131.020.000	26.9	86	42	57	4	0.35
16.131.025.000	33.7	89	45	64	6	0.39
16.131.032.000	42.4	102	50	76	6	0.5
16.131.040.000	48.3	114	57	89	6	0.65
16.131.050.000	60.3	127	64	95	6	1.1

## C12.132 Railing Base Flange



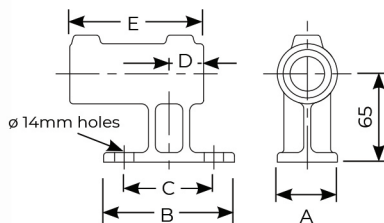
The Railing Base is designed to provide a base for railings and other structures.

Recommended this fitting be used in accordance with Croscos maximum post centre dimensions, see table 3 on Page 5.

Type	Tube size	A	B	C	D	E	Kg
16.132.020.000	26.9	76	65	8	76	114	0.60
16.132.025.000	33.7	89	76	9	89	128	0.91
16.132.032.000	42.4	89	80	10	102	140	1.03
16.132.040.000	48.3	89	89	10	114	152	1.24
16.132.050.000	60.3*	128	128	9	127	165	1.89

\* Has Ø 18mm holes

## C13.144 Railing Vertical Side Support

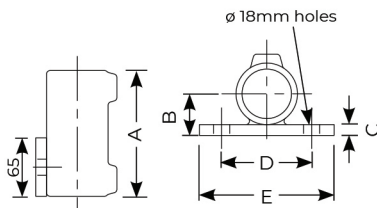


Designed to provide a base for railings and other structures that need a side mounted fixing.

Type	Tube size	A	B	C	D	E	Kg
16.144.025.000	33.7	45	96	67	28	104	0.6
16.144.032.000	42.4	50	109	78	30	114	0.91
16.144.040.000	48.3	60	123	86	34	120	1.03

Recommended this fitting be used in accordance with Croscos maximum post centre dimensions, see table 3 on Page 5.

## C14.145 Railing Horizontal Side Support

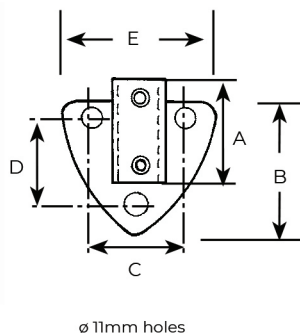


Designed to provide a base for railings and other structures that need a side mounted fixing.

Type	Tube size	A	B	C	Kg
16.145.025.000	33.7	90	30	12	1.08
16.145.032.000	42.4	90	35	12	1.32
16.145.040.000	48.3	90	41	15	1.67

Recommended this fitting be used in accordance with Croscos maximum post centre dimensions, see table 3 on Page 5.

## C15.146 Side Palm Fixing



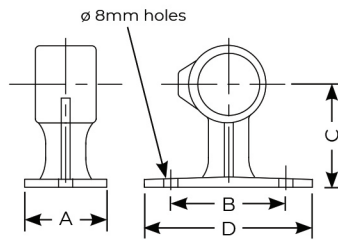
Designed to provide a base for railings and other structures that need a side mounted fixing.

Type	Tube size	A	B	C	D	E	Kg
16.146.025.000	33.7	76	89	71	63	97	0.63
16.146.032.000	42.4	84	98	82	72	108	0.80
16.146.040.000	48.3	92	104	86	78	112	0.84

Recommended this fitting be used in accordance with Croscos maximum post centre dimensions, see table 3 on Page 5.



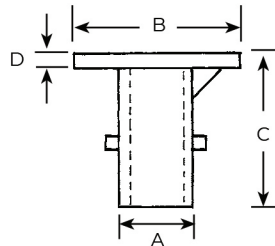
## C16.143 Handrail Bracket



The Handrail Bracket is designed to secure handrail tube to a wall. It can also be used on top of walls as a fixing for a low rail.

Type	Tube size	A	B	C	D	Kg
16.143.020.000	26.9	44	57	55	78	0.36
16.143.025.000	33.7	44	63	57	82	0.46
16.143.032.000	42.4	44	76	63	102	0.57
16.143.040.000	48.3	48	85	67	108	0.62

## C17.134 Ground Support

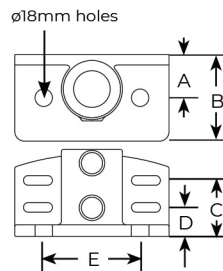


The Ground Socket is designed to provide a base that can be cast into the ground to support a post. The post is removable.

Type	Tube size	A	B	C	D	Kg
16.134.025.000	33.7	60	140	130	4.5	1.42
16.134.032.000	42.4	60	140	130	4.5	1.42
16.134.040.000	48.3	60	140	130	4.5	1.42

Recommend this fitting be used in accordance with Crosclo maximum post centre dimensions, see table 3 on Page 5.

## C18.142 Base Flange with Integrated Toeboard

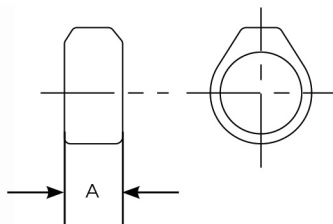


The Base Flange with Integrated Toeboard is ideal for guardrailing and balustrading applications where the addition of a toeboard is required. The side plates have slotted holes to allow for a degree of sideways movement for ease of installation.

Type	Tube size	A	B	C	D	E	Kg
16.142.032.000	42.4	45	90	58	30	100	2.14
16.142.040.000	48.3	45	90	58	30	100	2.28

Recommend this fitting be used in accordance with Crosclo maximum post centre dimensions, see table 3 on Page 5.

## C30.176 Collar

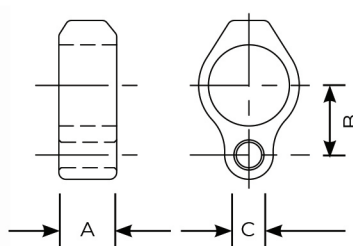


The Collar fitting can be used to support the C03 fitting when the latter is used as a hinge. It can also be used to increase the load capacity of another fitting when used together.

The C30 can be used as a stop for a sliding tube.

Type	Tube size	A	Kg
16.176.020.000	26.9	22	0.08
16.176.025.000	33.7	25	0.13
16.176.032.000	42.4	25	0.16
16.176.040.000	48.3	25	0.18
16.176.050.000	60.3	40	0.32

## C31.138 Gate Eye

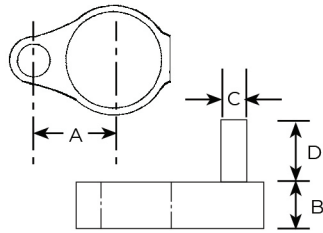


This fitting is designed as a gate eye for light weight gates. If a heavy gate is being used we recommend that C03 and C30 type fittings are used to support the gate.

Type	Tube size	A	B	C	Kg
16.138.020.000	26.9	25	30	15	0.14
16.138.025.000	33.7	25	33	15	0.19
16.138.032.000	42.4	25	38	15	0.25
16.138.040.000	48.3	25	41	15	0.26

# FIXINGS & ANCILLARIES

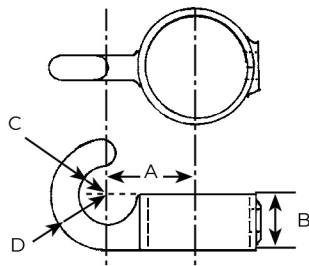
## C32.140 Gate Hinge



This fitting is designed as a gate hinge for light weight gates. If a heavy gate is being used we recommend that C03 and C30 type fittings are used to support the gate.

Type	Tube size	A	B	C	D	Kg
16.140.020.000	26.9	30	25	13	38	0.21
16.140.025.000	33.7	33	25	13	38	0.27
16.140.032.000	42.4	38	25	13	38	0.3
16.140.040.000	48.3	41	25	13	38	0.32

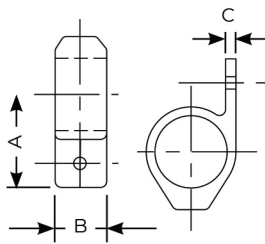
## C33.182 Hook



The fitting is designed to provide an attachment for chains.

Type	Tube size	A	B	C	D	Kg
16.182.020.000	26.9	32	25	10	25	0.17
16.182.025.000	33.7	34	25	13	21	0.24
16.182.032.000	42.4	39	25	13	25	0.25
16.182.040.000	48.3	41	25	13	25	0.3

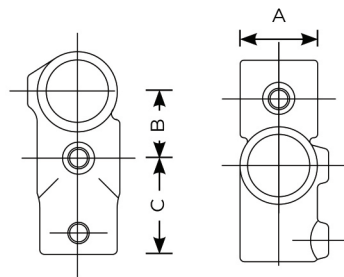
## C34.199 Fixing Pad



The fitting is designed to provide an attachment for flat sheets or board. It may also be used as a gate stop. An alternative fitting for the attachment of boards is the C35 type.

Type	Tube size	A	B	C	ø	Kg
16.199.025.000	33.7	45	25	5	6	0.16
16.199.032.000	42.4	53	40	5	11	0.32
16.199.040.000	48.3	56	40	5	11	0.35

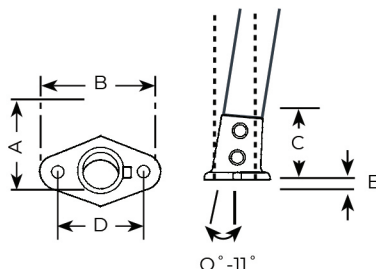
## C43.165 Combination Socket



The Combination Socket is designed for racking and similar systems to allow a crossover to be combined with a cross tie.

Type	Tube size	A	B	C	Kg
16.165.020.000	26.9	31	35	40	0.28
16.165.025.000	33.7	42	40	48	0.49
16.165.032.000	42.4	54	50	60	0.75
16.165.040.000	48.3	60	56	67	0.9
16.165.050.000	60.3	72	68	86	1.72

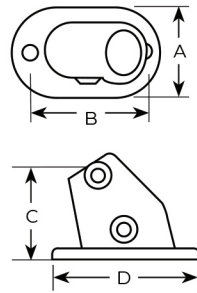
## C53.152 Slope Base (0° to 11°)



The Slope Base is designed to provide a base for use on ramps. The variable angle allows the fitting to accommodate slopes up to 11°.

Type	Tube size	A	B	C	D	E	Kg
16.152.032.000	42.2	91	140	79	102	10	0.9
16.152.040.000	48.3	96	152	80	114	10	1.4

## C59.151 Angle Base Flange (11° to 30°)

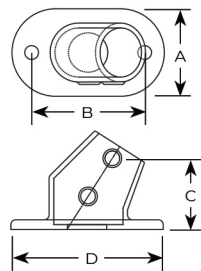


Similar to a type C53, it is used to set the upright at an angle between 11°–30°. This fitting should only be subjected to light loads which cannot be positioned at 90° to the applied load.

For greater loads or other tube sizes a type C12 flange should be used with the upright bent to the required angle  $\phi$  indicates the diameter of the fixing hole.

Type	Tube size	A	B	C	D	$\phi$	Kg
16.151.032.000	42.4	76	114	85	146	14	1.27
16.151.040.000	48.3	89	124	95	164	14	1.42

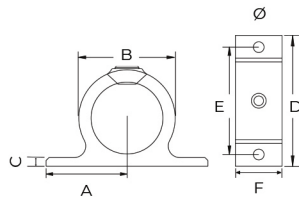
## C59A.A151 Angle Base Flange (30° to 45°)



Similar to a type C59, it is used to set the upright at an angle between 30° & 45°. This fitting should only be subjected to light loads which cannot be positioned at 90° to the applied load. For greater load use a type C12

Type	Tube size	A	B	C	D	Kg
16.A151.032.000	42.4	76	106	81	138	1.17
16.A151.040.000	48.3	89	115	85	155	1.53

## C200.200 Double Sided Fixing Bracket



The Type C200 is used as an attachment point for flat sheets or boards and comes supplied with a drilled hole.

Type	Tube size	A	B	C	D	E	F	$\phi$	Kg
16.C200.025.000	33.7	45	45	5	90	70	25	6.5	0.18
16.C200.032.000	42.4	53	55	6	106	86	40	11.5	0.38
16.C200.040.000	48.3	56	66.7	6	112	92	40	11.5	0.59





# FIXINGS & ANCILLARIES

## C60 Spare Screws



Spare Screws come in two sizes, 1/4" ISO 228 for the 20 and 25nb range and 3/8" ISO 228 for the 32, 40 and 50 ranges.

Type	Tube size
16.ALL.SCR.001	26.9, 33.7 & 42.4
16.ALL.SCR.002	48.3 & 60.3

## C61 Allen Keys



Allen keys are available in two sizes, the first is suitable for the 20 and 25nb fitting and the other for the 32, 40 and 50nb fittings.

Type	Tube size
16.KEY.020.025	26.9, 33.7 & 42.4
16.KEY.032.040	48.3 & 60.3

## C62R Ratchet Keys



The Ratchet driver and dual keys are available to speed assembly. The Ratchet driver will allow tightening to the correct torque.

Type	Tube size
16.PIP.RATCHET	ALL SIZES

## C65P.133 Plastic End Cap



Plastic End Caps are available for finishing plain end tubes. Available in grey plastic they will fit medium and heavy gauge tube.

Type	Tube size	Kg
16.133.020.000	26.9	0.008
16.133.025.000	33.7	0.010
16.133.032.000	42.4	0.010
16.133.040.000	48.3	0.016
16.133.050.000	60.3	0.024

## C65G.136 Metal End Cap

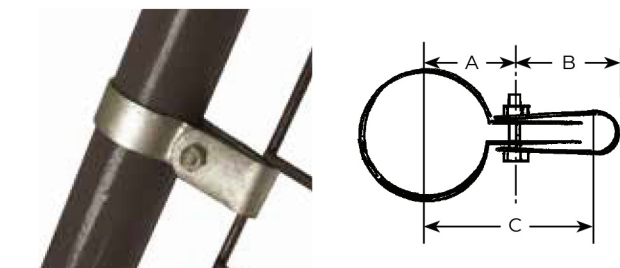


This metal plug is hard to remove once it has been driven in.

Note this metal insert can only be used in conjunction with tube with a wall thickness of 3.2mm. There is an alternative plastic version - C65P

Type	Tube size	Kg
16.136.020.000	26.9	0.05
16.136.025.000	33.7	0.10
16.136.032.000	42.4	0.12
16.136.040.000	48.3	0.17
16.136.050.000	60.3	0.29

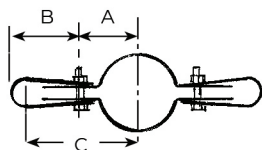
## C66.170 Single Mesh Clip



The Single Mesh Clip is designed to provide a fixing for standard mesh panels. It is recommended that the clips are spaced at a maximum of 450mm apart.

Type	Tube size	A	B	C	Kg
16.170.020.000	26.9	27	26	58	0.06
16.170.025.000	33.7	30	26	61	0.07
16.170.032.000	42.4	33	26	64	0.08
16.170.040.000	48.3	38	26	68	0.09
16.170.050.000	60.3	44	26	75	0.09

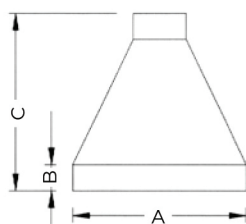
## C67.171 Double Mesh Clip



The Double Mesh Clip is designed to provide a fixing for standard mesh panels. It is recommended that the clips are spaced at a maximum of 450mm apart.

Type	Tube size	A	B	C	Kg
16.171.020.000	26.9	27	26	58	0.09
16.171.025.000	33.7	30	26	61	0.12
16.171.032.000	42.4	33	26	64	0.13
16.171.040.000	48.3	38	26	68	0.13
16.171.050.000	60.3	44	26	75	0.14

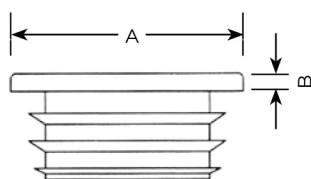
## C68.192 Weather Cowl



The Weather Cowl is designed to cover the Railing base and provides a weather proof seal when used with a suitable flexible sealant.

Type	Tube size	A	B	C	Kg
16.192.025.000	33.7	140	25	125	0.28
16.192.032.000	42.4	150	25	150	0.33
16.192.040.000	48.3	166	25	150	0.38

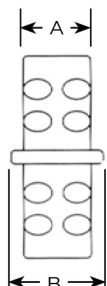
## C69 Square Plastic End Cup



The Plastic End Caps are available for finishing plain end square tubes. Available in grey plastic they will fit medium and heavy tube gauges.

Type	Tube size	A	B	Kg
16.C69.040.040	40X40SHS	40	3.2	0.01
16.C69.050.050	50x50SHS	50	3.2	0.01
16.C69.070.070	70x70SHS	70	3.2	0.02

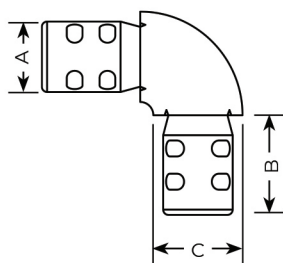
## C70 Crimp Straight



Straight Crimp Joints provide a permanent in-line connection for 33.7mm diameter x 3.2mm thick tube, a crimping tool is necessary.

Type	Tube size	A	B	Kg
16.C70.025.000	33.7	(Ø)26.0	34	0.3

## C71 Crimp Elbow



Crimp Elbow provides a permanent 90° connection for 33.7mm diameter x 3.2mm thick tube, a crimping tool is necessary.

Type	Tube size	A	B	C	Kg
16.C71.025.000	33.7	26	38	34	0.47

## HANDRAILING FOR THE DISABLED

Under the terms of the Equality Act 2010 (previously the Disability Discrimination Act), reasonable adjustments need to be made to public and commercial buildings to overcome physical barriers which prevent disabled access. The Building Regulations recommend an outside diameter tube size for installations of between 40mm-45mm.

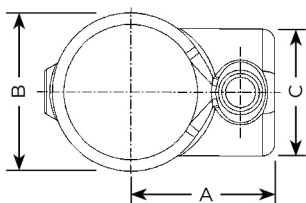
The DDA range has been designed to meet these requirements by providing a non-discriminatory handrail solution that complies with the Equality Act and Part 'M' of the Building Regulations.

The range allows construction of a smooth, continuous handrail of 42.4mm diameter.

DDA fittings are supplied hot dip galvanised as standard, but can be supplied in a powder coated finish to RAL standard colours (subject to quantity and availability from the coaters).

In cold temperatures, a powder coated finish will give the impression of being warmer to the touch.

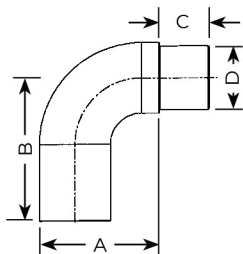
### DDA-01 Upright Connector



Type	A	B	C	Kg
16.DDA.001.CON	55	60	50	0.38

Connector for attaching the DDA04 intermediate bracket or the DDA02 handrail connector to the 48.3mm o/d upright.

### DDA-02 Handrail Connector

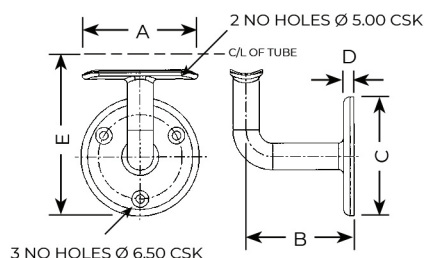


Type	A	B	C	D	Kg
16.DDA.002.RAI	51	86	30	38	0.48

Connector (made from Ductile Iron) for attaching the end of the 42.4mm o/d handrail tube at 90° to the 48.3mm o/d upright.

This bracket is used in conjunction with DDA01 and DDA07.

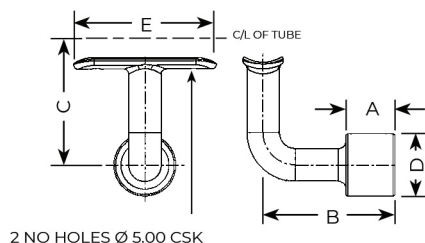
### DDA-03 Wall Bracket



Type	A	B	C	D	E	Kg
16.DDA.003.WBR	88	82	90	8	84	0.62

Bracket (made from Ductile Iron) for supporting the 42.4mm o/d handrail tube to a wall. The 42.4mm o/d tube is fixed to the DDA03 using either 2 x self tapping screws or 2 x pop rivets.

### DDA-04 Intermediate Bracket

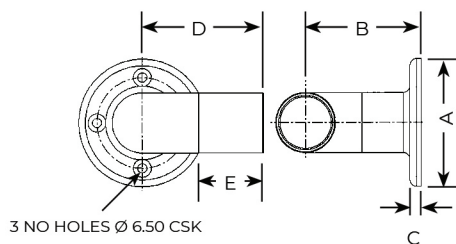


Type	A	B	C	D	E	Kg
16.DDA.004.INB	30	81	84	38	88	0.44

Bracket (made from Ductile Iron) for supporting the top or middle rail tube at an upright in conjunction with a DDA01. The 42.4mm o/d tube is fixed to the DDA04 using either 2 x self tapping screws or 2 x pop rivets.



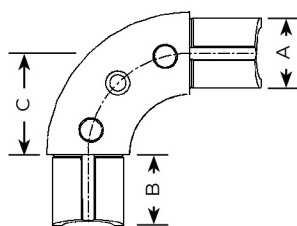
## DDA-05 End Return



Type	A	B	C	D	E	Kg
16.DDA.005.END	90	82	8	86	46	0.64

Bracket (made from Ductile Iron) for terminating the 42.4mm o/d handrail tube back to a wall. This bracket is used in conjunction with a DDA07.

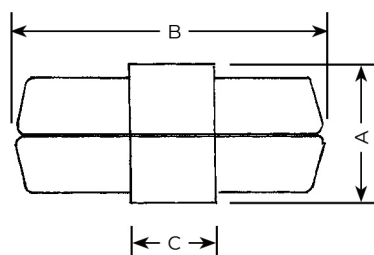
## DDA-06 90° Bend



Type	A	B	C	Kg
16.DDA.006.BEN	33.7	35	50	0.93

Expanding elbow (made from Ductile Iron) for creating a smooth 90° bend in the 42.4mm o/d tube.

## DDA-07 Internal Connector



Type	A	B	C	Kg
16.DDA.07.CON	42.4	75	19	0.35

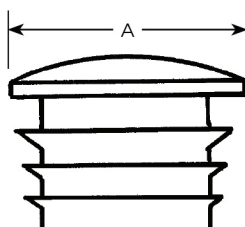
Expanding internal connector for joining sections of 42.4mm o/d tube, or other DDA fittings as and when required.



### WARNING!

Inline internal connector for joining two tubes together. Only medium gauge 3.2mm wall thick tube can be used. The DDA07 should never be used as a load bearing joint. The DDA07 must be used within 100mm of an upright.

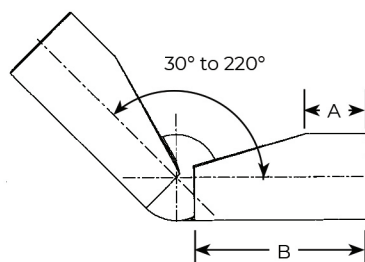
## DDA-08 Plastic End Cap



Type	A	Kg
16.133.040.000	48.3	0.016

48.3mm o/d plastic end cap for inserting into the open tube on the top of the upright. For a permanent fix, a suitable adhesive should be used.

## DDA-09 Adjustable Bend



Type	A	B	Kg
16.DDA.09.ADB	31	86	0.61

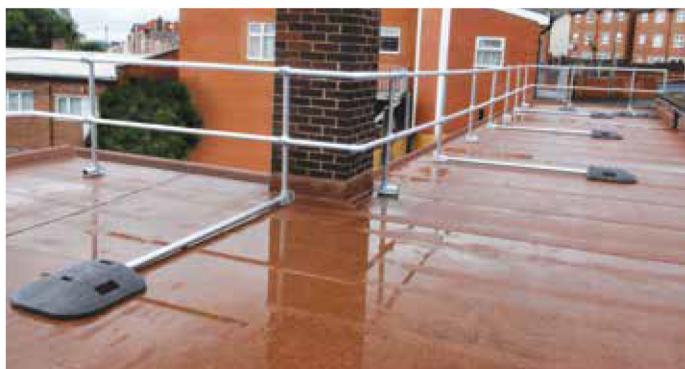
Fitting (made from Ductile Iron) for creating an adjustable bend between the horizontal and the vertical.

# ROOF EDGE PROTECTION

## ROOF EDGE PROTECTION

Defender Roof Edge Protection systems operate on a counterbalance principle using curved PVC counterweights as the main component. A galvanised malleable iron foot with a protective rubber base supports the handrail post; this includes an integral toeplate facility which is a fundamental requirement if there is no perimeter edge upstand.

All systems feature 1100 mm tall factory preassembled uprights that include open cradle fittings allowing the handrail tube to be quickly dropped into place instead of the time consuming process of the tube being fed through several fittings as required with other systems, speeding up assembly and saving cost.



### ECONOMY SYSTEM

A simple and cost effective way of protecting roof edges.



### STANDARD SYSTEM

Shorter length counterweight tubes, enables installation in restricted roof areas.



### PLUS SYSTEM

Aesthetically pleasing, curved uprights with 3 rails for added security.

## Benefits of Defender Roof Edge Protection

- System is effectively maintenance free with hot dip galvanised fittings and tube to BS EN ISO 1461
- Recycled PVC counterweights
- For use on asphalt, coated steel sheeted, concrete or mineral felt roofs
- Rapid installation, no special tools or specialised labour required
- No on site welding or bending required
- Base fitting allows option of installing uprights up to 11° from vertical
- Bolt on toeplate available to comply with HSG 33.

Our systems are freestanding, with no requirement for fixings or drilling and subsequently no repair to the roof membrane.

Suitable for flat roofs up to 3° pitch.

The systems can be configured to satisfy the requirements of BS EN 13374 Class A.



## SELF CLOSING SAFETY GATES



Crosco supplies a range of self-closing industrial safety gates. Gates are suitable for external and internal applications, and can be retro-fitted to existing structures.

The gates are spring loaded to automatically close behind the user, to provide a safe environment and overcome the problem of human error. Industrial safety gates provide a safe access to demarcated areas within factories, warehouses and loading bays.

Our industrial safety gates are compliant with the requirements of EN 13374 and EN 14122. The gates have been extensively tested to ensure their durability and reliability.



Crosco self-closing safety gates are supplied 1m wide and 2 x 0.9m wide for larger openings. The gates are available either hot dipped galvanised or powder coated in safety yellow and can be easily trimmed to size on-site.

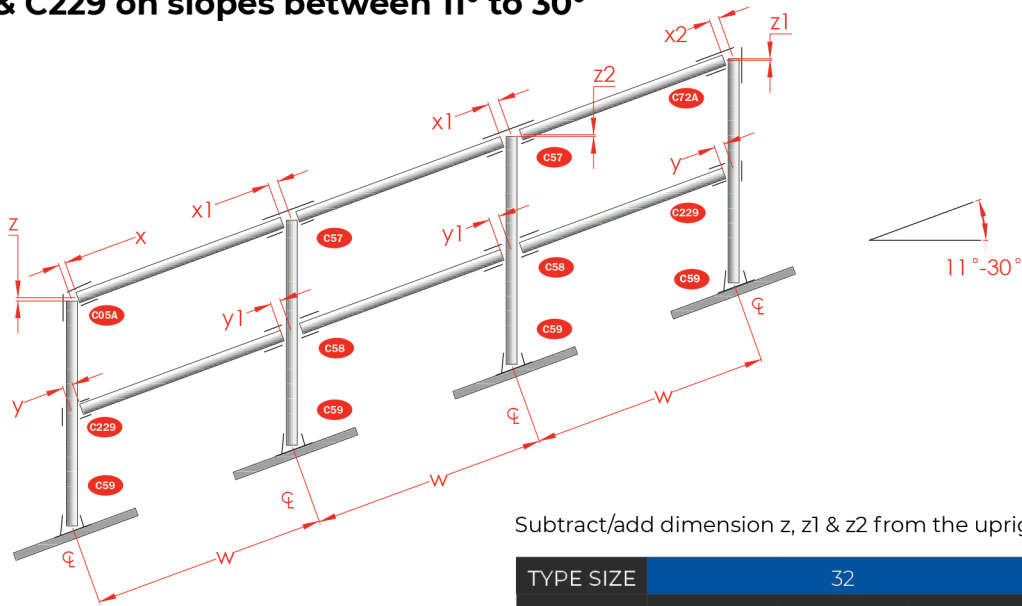
- Single and double width gates
- Easy to assemble
- Performance tested for trouble free operation
- Fully adjustable for varying widths

Type	Description
RE00T40	RE00T40 - EN - 14122 Defender Vertical Toe-Board Upright
RE11P40	Defender Roof Edge Counterweight assembly
RE11P40S	Short Defender C/B Assembly
RE12P40	Defender Roof Edge Run End Weight assembly
SGEUGV2	Single Gate - Galvanised
SGEUPC2	Single Gate - Powder Coated Galvanised
SGEUUP	Upgrade Kit



# SIZING CHARTS

## How to calculate correct tube cutting length using types C05A, C57, C58, C59A, C72A & C229 on slopes between 11° to 30°



Subtract/add dimension z, z1 & z2 from the upright height

TYPE SIZE	32			40		
	z	z1	z2	z	z1	z2
11°	-10	-28	+7	-20	-34	+6
15°	-11	-25	+7	-25	-29	+6
20°	-13	-34	+7	-21	-39	+6
25°	-15	-43	+7	-22	-50	+6
30°	-18	-53	+7	-4	-61	+6

x Dimensions to be added/subtracted from upright height

Subtract dimension x, x1, x2, y or y1 from upright centres (w). Please note the upright centres must be measured on the slope

TYPE SIZE	32					40				
	x	x1	x2	y	y1	x	x1	x2	y	y1
11°	-25	-26	-35	-52	-26	-26	-29	-35	-51	-29
15°	-21	-28	-46	-53	-58	-22	-31	-47	-52	-31
20°	-16	-30	-48	-55	-30	-20	-34	-50	-54	-34
25°	-15	-33	-52	-59	-33	-14	-38	-54	-57	-38
30°	-8	-37	-57	-64	-42	-29	-42	-60	-62	-42

## How to calculate correct tube cutting length using types C041, C042, C12 & C221 on slopes between 30° to 45°

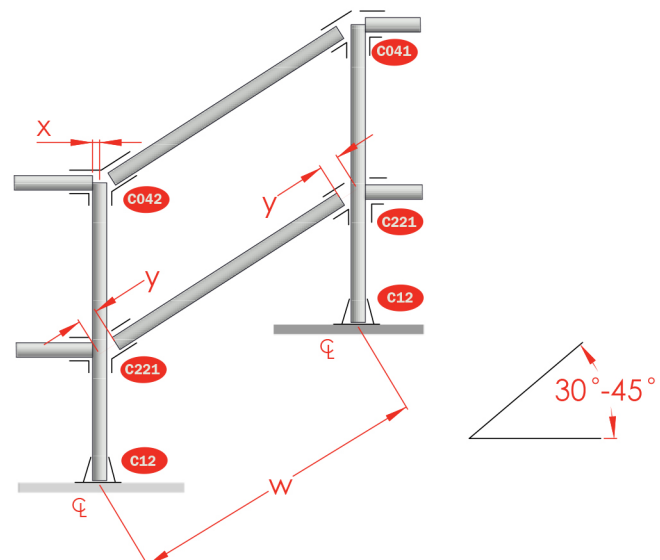
Subtract dimension x to determine rail size on level

TYPE SIZE	32	40
	x	x
35-45°	-21	-24

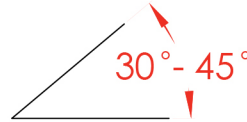
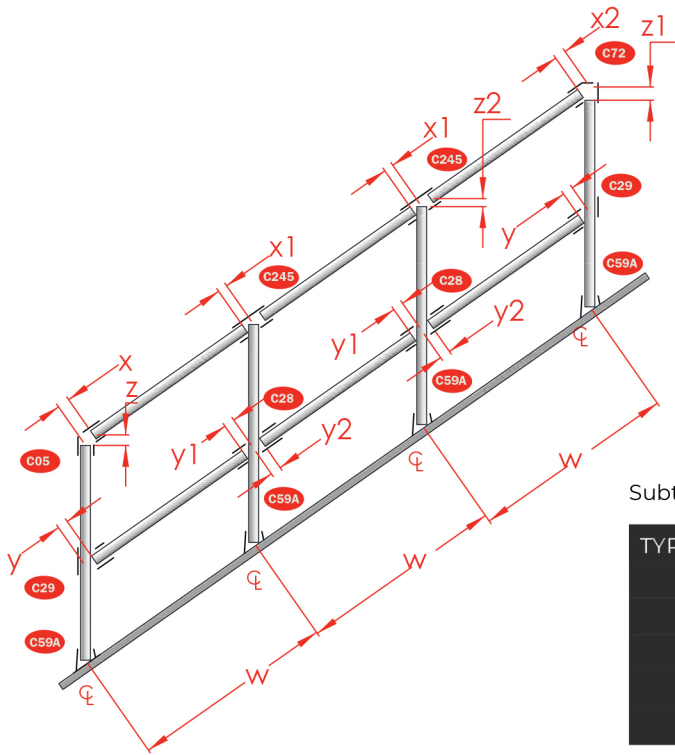
y Dimensions to be subtracted from upright centres

Please note upright centres must be measured on the slope

TYPE SIZE	32	40
	y	y
30°	-47	-57
35°	-52	-62
40°	-59	-69
45°	-68	-79



How to calculate correct tube cutting length using types C05, C245, C28, C59A, C72 & C29 on slopes between 30° to 45°



Subtract/add dimension z, z1 & z2 from the upright height

TYPE SIZE	32			40		
	z	z1	z2	z	z1	z2
30°	-17	-48	+5	-27	-47	+6
35°	-16	-59	+5	-21	-53	+6
40°	-8	-69	+5	-14	-68	+6
55°	-2	-80	+5	-5	-79	-4

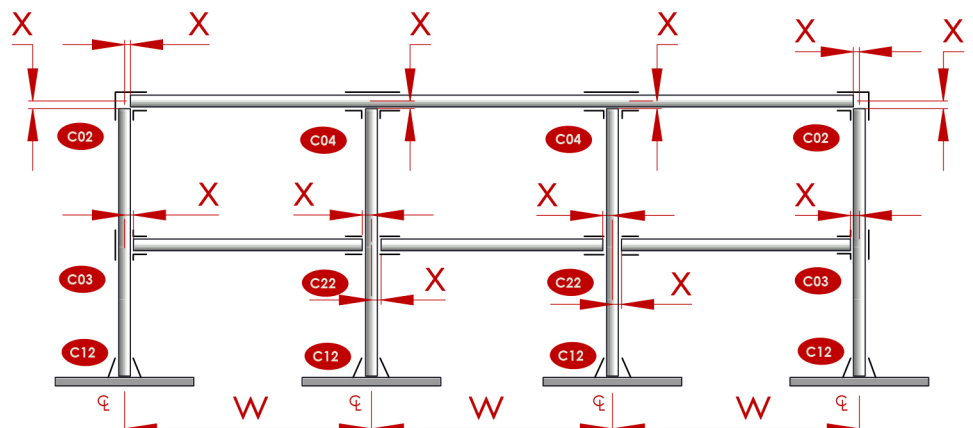
Subtract dimension x, x1, x2, y or y1 from upright centres (w). Please note the upright centres must be measured on the slope

TYPE SIZE	32					40				
	x	x1	x2	y	y1	x	x1	x2	y	y1
30°	-20	-39	-55	-37	-49	-17	-42	-48	-43	-64
35°	-16	-44	-61	-40	-50	-18	-46	-60	-47	-64
40°	-20	-47	-71	-45	-51	-21	-52	-65	-52	-64
45°	-26	-50	-85	-51	-51	-26	-58	-60	-59	-64

How to calculate correct tube cutting length for straight and level handrails

W = Distance between uprights  
C to C

SIZE	
32	40
x	x
-22	-25



# BALL STANDARDS



## BALL STANDARDS

Flocon offers Ball Standards in both finished and semi-finished formats together with handrail return bends.

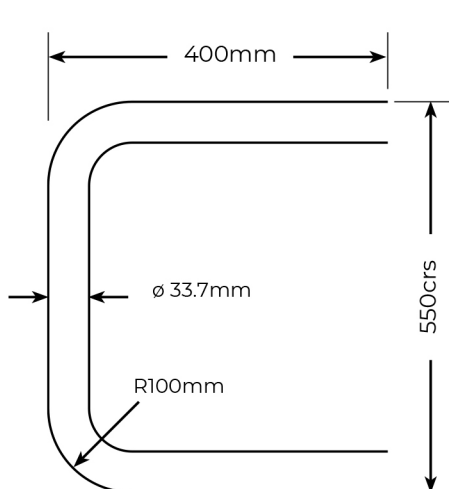
Hot dip galvanised finished standards are constructed from 42.4mm diameter tube complete with balls, suitable for 33.7mm diameter handrailing.

Balls are drilled & tapped, and fitted with stainless steel M8 socket setscrews.

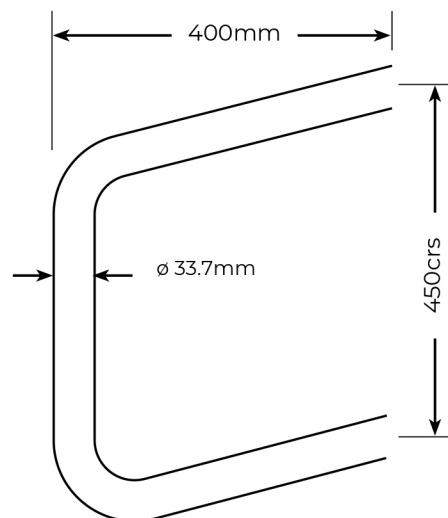
Base plates are complete with 18mm diameter holes to suit M16 fixing bolts.

- Self colour sticks from stock
- Sticks hot dip galvanised ready
- Types 62, 64, 65, 68, 69 & 115 bases for Sticks
- Hot dip galvanised standards from stock
- 38° and 42° staircase standards from stock
- Standards complete with stainless steel setscrew in each ball
- Other diameters and formats available, please send details for quote

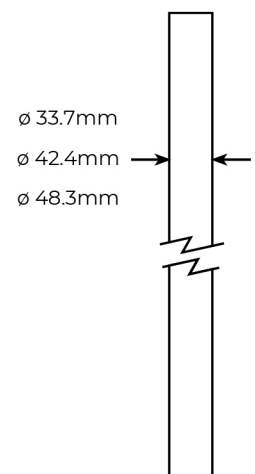
## HANDRAILING & RETURN BENDS



**Platform Return Bends**  
33.7mm diameter from stock



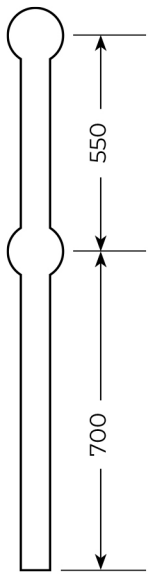
**Stair Return Bends**  
33.7mm diameter from stock



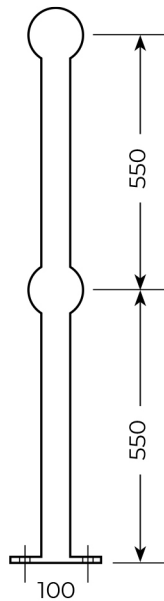
**Stair Return Bends**  
33.7, 42.4 and 48.3mm  
handrail tube from stock



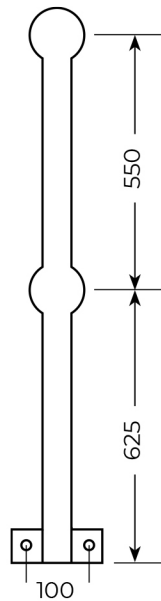
# BALL STANDARDS



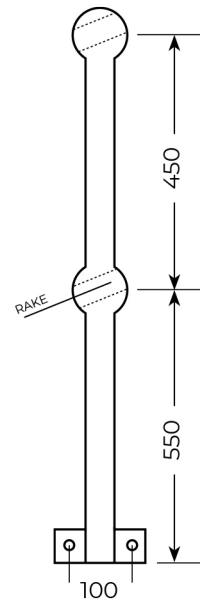
**STICK**



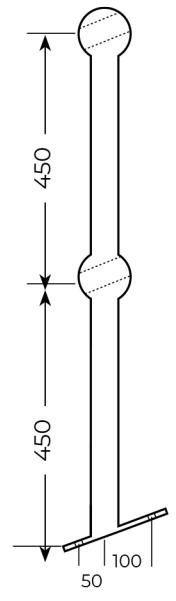
**PLATFORM  
FLAT**



**PLATFORM  
HSP**



**RAKING  
HSP**



**RAKING  
FLAT**

## FITTINGS FOR USE WITH BALL STANDARDS



**C00** Sleeve Joint



**C02** 90° Elbow



**C41** Clamp on Tee



**C11** Wall Flange



**C12** Railing Flange



**C13** Vertical  
Railing Base



**C14** Horizontal  
Railing Base



**C15** Side Palm



**C18** Railing Flange  
(Toeboard adaptor)



**C200** Horizontal  
Railing Support



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