

Technical Manual

Dura Key Clamp Handrailing



Dura Composites offer a high quality, round tubular GRP Handrail system complete with all fittings. Dura Key Clamp Handrailing is lightweight and easy to handle and offers low installation and maintenance costs as it doesn't require painting or galvanising. Despite its lightweight properties, GRP handrailing offers impressive strength-to-weight and load-bearing performance.

The wide range of connectors in our standard range means the handrails can be installed quickly and easily in a variety of industrial and transport environments such as high-voltage areas, rail stations and track-side settings to provide worker or general public safety.

If you require any further information or support, please visit www.duracomposites.com or call us on +44 (0)1255 423601 where one of our team will be happy to help.

Unlocking the Power of Composites™
>> for Safety Handrailing

Tel: 01255 423601 | www.duracomposites.com

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Reference Guide



This Quick Reference Guide refers to Dura Key Clamp Handrailing from Dura Composites Ltd, constructed from Glass Reinforced Polymer (GRP) as an ideal and cost effective alternative to traditional handrailing materials such as steel, largely thanks to their electrically non-conductive and warm to touch properties.

1. Applications:

Dura Composites was founded in 1996 and has been at the forefront of composite technology for 25 years. Dura Key Clamp Handrailing is non-conductive and non-corrosive and is perfect for protecting and identifying hazardous storage areas, high voltage areas, embankment staircases, disabled access ramps, railway sidings, platforms and walkway edges.

2. Benefits:

Our GRP modular handrailing is easy to handle and offers low installation and maintenance costs as it never needs painting or galvanising. Despite its lightweight properties, it offers impressive strength-to-weight and load-bearing performance.

- Versatile and modular
- Non-conductive
- Warm to the touch
- Resistant to corrosion
- Low maintenance - no galvanising or painting required
- High strength-to-weight ratio

3. Key Features:

- Dura Key Clamp Handrail profiles are produced by a 'pultrusion' process - a continual automated process which manufacture our profiles to meet standard EN 13706-3
- Synthetic surface veil
- UV inhibitor
- Excellent chemical resistance
- Long design life
- Highly durable
- Simple & rapid construction - pre-assembled options available
- Range of fixings & fasteners available

4. Colours:

Dura Key Clamp Handrailing system can be specified in high visibility safety yellow (RAL 1023) or grey (RAL 7043), both colours that will not require painting, staining or galvanising.

As well as our standard range colours, our handrailing can be produced in other colours and resins. These are subject to minimum order quantities and extended lead times, so please call us to discuss your requirements at your earliest convenience.



Yellow
(RAL 1023)



Grey
(RAL 7043)

All colour swatches and images shown in this document are intended as a representation only and should not be considered as an exact colour match. Where possible, we would recommend ordering a Key Clamp Handrail sample so you can assess colour suitability before placing your order.

Dura Composites' manufacturing process results in a high level of colour consistency although some variation in colour may be apparent across products from different production batches.

5. Fixings:

For all fixings and the correct application please refer to page 13.

6. Load Strength:

Dura Key Clamp Handrailings load capacity is extremely high. For specific load capacity by product, please refer to the data tables referenced within this document.

7. Handling, Re-working & Machinery of GRP Materials - COSHH Advisory Notes:

Handling/Cutting

Please ensure you wear an appropriate mask and goggles when cutting or grinding any of the Dura Key Clamp Handrailing product range. Exposed parts of the body should also be covered. Gloves are recommended when moving or lifting the product. Diamond tipped tools provide the best cut finish when altering products. Operators should observe the correct Manual Handling techniques when lifting, moving and installing Dura Key Clamp Handrailing products to prevent personal injury.

Use of Power Tools

The general guidelines when cutting or machining GRP products with power tools, as the material produces a non-toxic, biologically inert dust. Dust levels should be kept as low as is reasonably practicable and must not exceed occupational exposure limits. In isolated cases, GRP dust may cause a slight, transient skin irritation. Should these effects become prolonged or should any signs of a rash occur, medical advice should be sought. All exposed skin should be thoroughly washed with soap and water. Any eye contamination should be washed out with copious amounts of bottled sterile water or fresh clean water. Operatives installing this product range should not smoke, eat or drink in the area of installation or where the product is being assembled.

For more information please contact your Dura Composites representative.

8. Disposal & Environmental Considerations:

Even after they have been used for their intended purpose and reach the end of their lifecycle in the original context, the products can easily be up-cycled or repurposed in other ways. We are happy to advise all customers on their specific scenarios. The product itself is not considered a hazardous waste. Please ensure that you abide by local laws and procedures regarding disposal if you choose not to upcycle or re-use your product at the end of its initial lifecycle.

Glass-reinforced polymer (GRP) is a composite material made of a thermosetting plastic resin reinforced by E-Glass rovings and woven mat along with the use of additives and is commonly referred to by the name of fibreglass and sometimes by the name FRP or fibre reinforced plastic.

Hazard Identification

None by contact. Dust produced by cutting or grinding can penetrate pores and skin causing itching. Avoid breathing dust, skin contact or dust inhalation when cutting. People with a condition that could be aggravated by dust should avoid cutting or grinding.

Waste Disposal

GRP is an inert product. Currently, scrap and waste material should be disposed of in approved landfill facilities adhering to local regulatory handling and documentation requirements. The material presents no special hazard to the environment.

First Aid Procedure

Skin – shower with water and soap. Eyes – flush with sterile eye wash solution.

9. Cleaning and Maintenance:

Unless the product is subject to conditions outside of the design criteria, minimal routine inspection of the material would be required. Circumstances will vary, based upon the volume of use, but as a guide; monthly inspections are advisable and all fixings should be checked to ensure any bolts have not become loose. Simple cleaning with mild detergent solution and non-abrasive wipes/brushes will restore the appearance of the handrail.

10. Chemical Resistance:

Dura Key Clamp Handrailing is resistant against a wide range of chemicals across a wide temperature spectrum. For more details consult your Dura Composites representative.

11. Service Life & Warranty:

GRP materials carry a warranty of 25 years with an expected design life of 60+ years. GRP handrails have been used successfully in building and constructions for decades, with no discernible degradation in performance. Some fading of colour is expected over time where the product is continually exposed to sunlight.

Refer to website for further warranty details: <https://www.duracomposites.com/about-dura/warranty/>



Installation Scenarios



Choosing the Right Components for Your Installation Scenarios

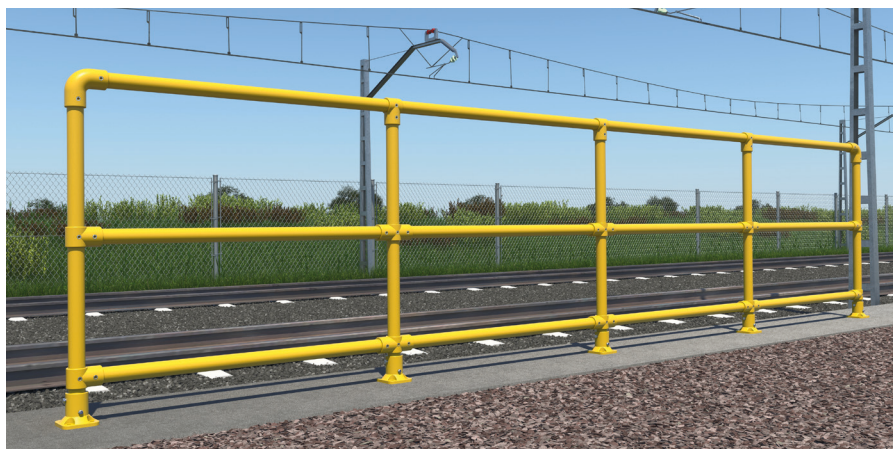
To select the correct installation scenario, you should first determine your required load, span and deflection requirements. Whilst one scenario may meet your minimum requirements, other options might also be applicable which carry greater loads. For the most cost-effective selection, you should choose the greatest width that will support the load consistent with your job requirements. In almost every case, we are confident that our Dura Key Clamp Handrailing will prove to be the most cost efficient option for your project, without compromising on safety.

Typical Scenarios

Top Rail & Double Mid Rail

Main Components:

- 90° Elbow
- 3WayTee
- 4WayTee
- Base Foot



Individual Units

Main Components:

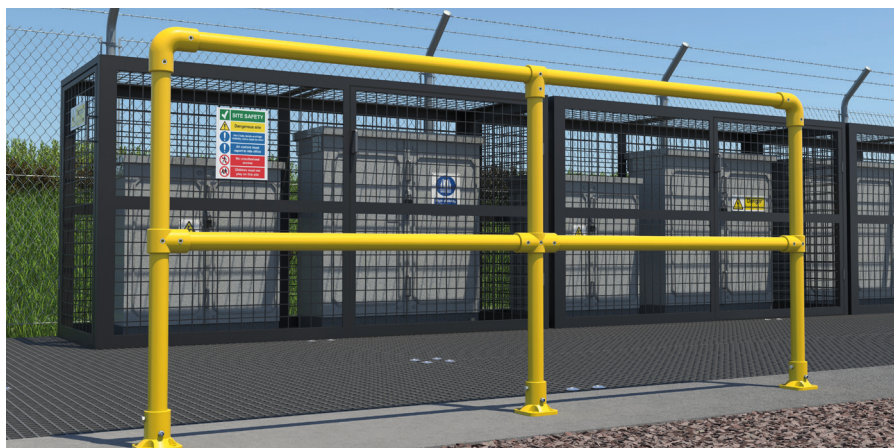
- 90° Elbow
- 3WayTee
- Base Foot



Top Rail & Single Mid Rail

Main Components:

- 90° Elbow
- 3WayTee
- 4WayTee
- Base Foot



Corner Key Clamp Handrail

Main Components:

- 90° Elbow
- 3WayTee
- 4WayTee
- Directional 3WayTee
- Directional 4WayTee
- Base Foot



Adjustable Elbow (to accommodate irregular corners)

Main Components:

- Adjustable Elbow
- 120° Elbow
- 3WayTee
- 4WayTee
- Base Foot



Gates

Main Components:

- TruClose Hinge Connection
- 64 x 64 x 6.4 Box
- 90° Elbow
- 3WayTee
- 4WayTee
- Base Foot



30° Staircase Key Clamp Handrail

Main Components:

- 90° Elbow
- 120° Elbow (shown in close up)
- 150° Elbow (shown in image)
- 60° 3WayTee
- 60° 4WayTee
- 3WayTee
- 4WayTee
- Base Foot



4Way Staircase Key Clamp Handrail

Main Components:

- Vertical Multiple
- Universal 4Way
- Adjustable Elbow
- 90° Elbow
- 3WayTee
- 4WayTee
- Base Foot



Box Side Mount Key Clamp Handrail

Main Components:

- Vertical Multiple
- Universal 4Way
- 64 x 64 x 6.4 Box
- Adjustable Elbow
- 90° Elbow
- 3WayTee
- 4WayTee
- Kickplate



Ramp Key Clamp Handrail

Main Components:

- Adjustable Elbow
- 90° Elbow
- 3WayTee
- 4WayTee
- Base Foot



Box Key Clamp Handrail with Kickplate

Kickplate for side mounted posts only

Main Components:

- 64 x 64 x 6.4 Box
- 90° Elbow
- 3WayTee
- 4WayTee
- Kickplate



With Mesh Infill Connectors

Various GRP mesh options are available

Main Components:

- 13mm Mesh Panel
- Infill Connector
- 90° Elbow
- Base Foot

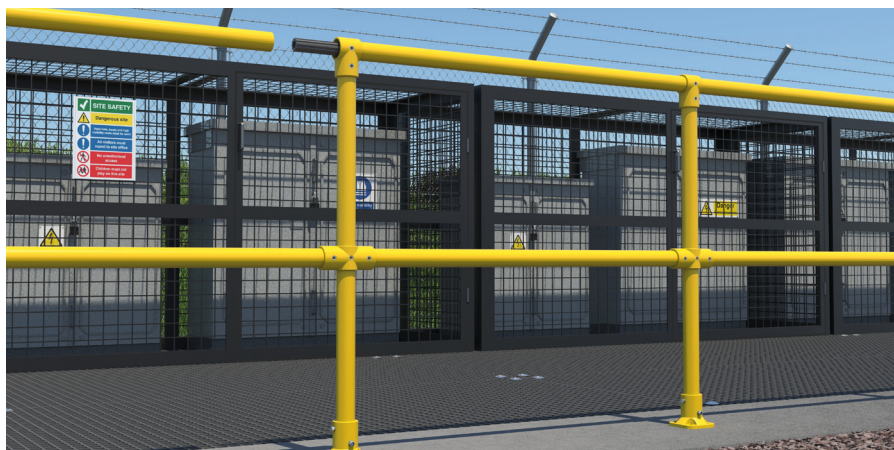


34mm diameter Spigot Joint at 6m

(if using pre-fabricated post with 3WayTee)

Main Components:

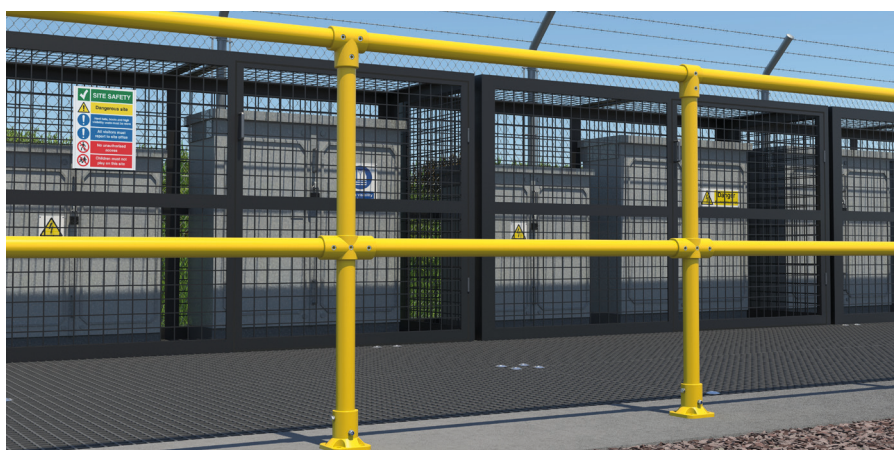
- 300mm Spigot Tube
- 3WayTee
- 4WayTee
- Base Foot



Extended 3WayTee at 6m Top Rail Connection

Main Components:

- Extended 3WayTee
- 3WayTee
- 4WayTee
- Base Foot



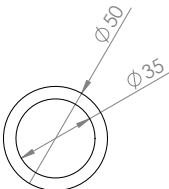
Materials

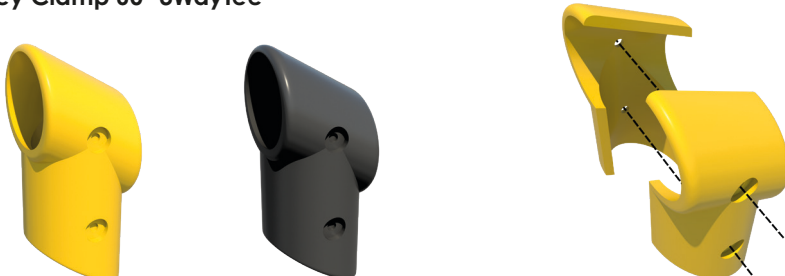
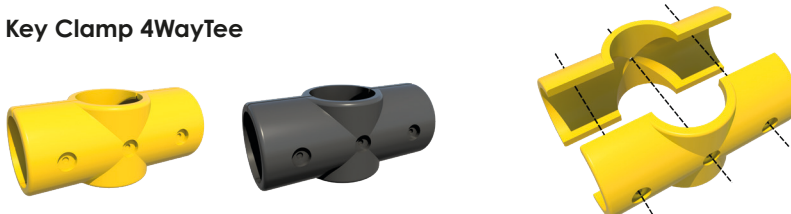

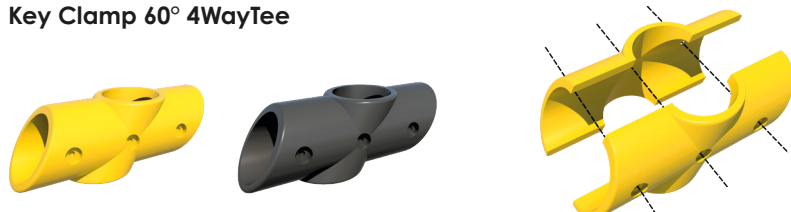







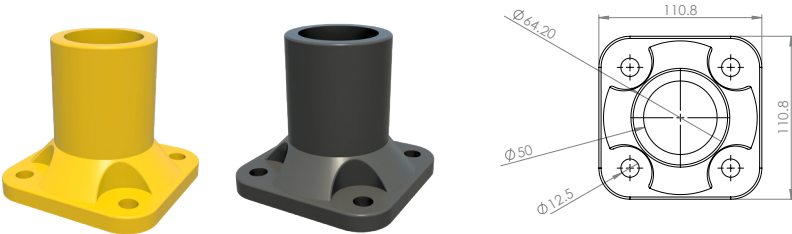
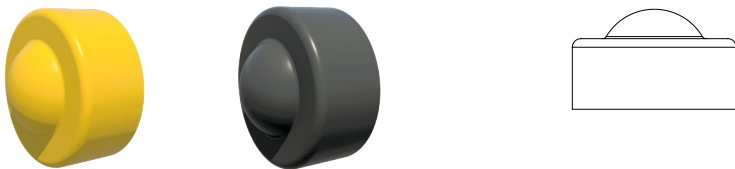
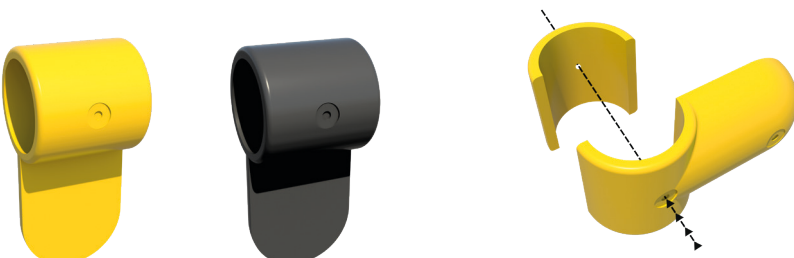
Components

The wide range of connectors in our standard range means that handrails can be installed quickly and easily in a variety of station and track-side settings. Find the product codes you require below.

Please note the majority of connectors have counter-bore points to indicate where popnut fixings should be positioned. Counter-bore points will need to be drilled on installation from each side using a 6mm and 9mm drill bit (not supplied) before the fixing is applied, as they do not come pre-drilled.

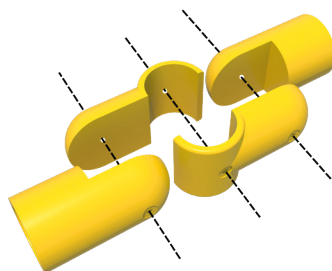
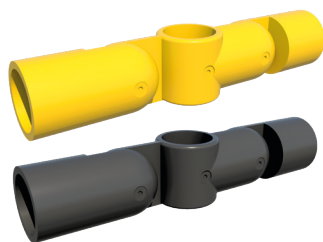
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Key Clamp Kickplate	 	<table><tr><td>Weight</td><td>4.5kg/m</td></tr><tr><td>Length</td><td>3010mm</td></tr><tr><td colspan="2">Part Codes</td></tr><tr><td>Yellow</td><td>DR02008</td></tr><tr><td>Grey</td><td>DR02029</td></tr></table>	Weight	4.5kg/m	Length	3010mm	Part Codes		Yellow	DR02008	Grey	DR02029
Weight	4.5kg/m											
Length	3010mm											
Part Codes												
Yellow	DR02008											
Grey	DR02029											
Key Clamp Handrail Tube	 	<table><tr><td>Weight</td><td>1.9kg/m</td></tr><tr><td>Length</td><td>6m</td></tr><tr><td colspan="2">Part Codes</td></tr><tr><td>Yellow</td><td>DR03008</td></tr><tr><td>Grey</td><td>DR03028</td></tr></table>	Weight	1.9kg/m	Length	6m	Part Codes		Yellow	DR03008	Grey	DR03028
Weight	1.9kg/m											
Length	6m											
Part Codes												
Yellow	DR03008											
Grey	DR03028											
Key Clamp 3WayTee	 	<table><tr><td>Weight</td><td>0.27kg/m</td></tr><tr><td colspan="2">Part Codes</td></tr><tr><td>Yellow</td><td>DR04002</td></tr><tr><td>Grey</td><td>DR05002</td></tr></table>	Weight	0.27kg/m	Part Codes		Yellow	DR04002	Grey	DR05002		
Weight	0.27kg/m											
Part Codes												
Yellow	DR04002											
Grey	DR05002											
Key Clamp Directional 3Way	 	<table><tr><td>Weight</td><td>0.54kg/m</td></tr><tr><td colspan="2">Part Codes</td></tr><tr><td>Yellow</td><td>DR04003</td></tr><tr><td>Grey</td><td>DR05003</td></tr></table>	Weight	0.54kg/m	Part Codes		Yellow	DR04003	Grey	DR05003		
Weight	0.54kg/m											
Part Codes												
Yellow	DR04003											
Grey	DR05003											

Component	Technical Information	Product Information								
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Part Codes										
Yellow	DR04004									
Grey	DR05004									
Key Clamp 4WayTee										
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Part Codes										
Yellow	DR04005									
Grey	DR05005									
Key Clamp Directional 4Way										
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Weight	0.65kg/m									
Part Codes										
Yellow	DR04006									
Grey	DR05006									
Key Clamp 60° 4WayTee										
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Part Codes										
Yellow	DR04007									
Grey	DR05007									
Key Clamp Vertical Multiple (Adjustable)										
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Weight	0.58kg/m									
Part Codes										
Yellow	DR04008									
Grey	DR05008									
Key Clamp 90° Elbow										
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Weight	0.41kg/m									
Part Codes										
Yellow	DR04009									
Grey	DR05009									

Component	Technical Information	Product Information								
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Weight	0.32kg/m									
Part Codes										
Yellow	DR04010									
Grey	DR05010									
Key Clamp 150° Elbow		<table><tr><td>Weight</td><td>0.4kg/m</td></tr><tr><td colspan="2">Part Codes</td></tr><tr><td>Yellow</td><td>DR04011</td></tr><tr><td>Grey</td><td>DR05011</td></tr></table>	Weight	0.4kg/m	Part Codes		Yellow	DR04011	Grey	DR05011
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Part Codes										
Yellow	DR04011									
Grey	DR05011									
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Weight	0.49kg/m									
Part Codes										
Yellow	DR04012									
Grey	DR05012									
Key Clamp Base Foot		<table><tr><td>Weight</td><td>0.65kg/m</td></tr><tr><td colspan="2">Part Codes</td></tr><tr><td>Yellow</td><td>DR04013</td></tr><tr><td>Grey</td><td>DR05013</td></tr></table>	Weight	0.65kg/m	Part Codes		Yellow	DR04013	Grey	DR05013
Weight	0.65kg/m									
Part Codes										
Yellow	DR04013									
Grey	DR05013									
Key Clamp Top Cover		<table><tr><td>Weight</td><td>0.1kg/m</td></tr><tr><td colspan="2">Part Codes</td></tr><tr><td>Yellow</td><td>DR04014</td></tr><tr><td>Grey</td><td>DR05014</td></tr></table>	Weight	0.1kg/m	Part Codes		Yellow	DR04014	Grey	DR05014
Weight	0.1kg/m									
Part Codes										
Yellow	DR04014									
Grey	DR05014									
Infill Connectors		<p>Please note: fixings are subject to individual requirements.</p> <table><tr><td>Weight</td><td>0.27kg/m</td></tr><tr><td colspan="2">Part Codes</td></tr><tr><td>Yellow</td><td>DR04015</td></tr><tr><td>Grey</td><td>DR05015</td></tr></table>	Weight	0.27kg/m	Part Codes		Yellow	DR04015	Grey	DR05015
Weight	0.27kg/m									
Part Codes										
Yellow	DR04015									
Grey	DR05015									

Component	Technical Information	Product Information
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Key Clamp Universal 4Way



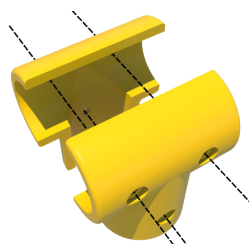
Weight	1kg/m
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Part Codes

Yellow	DR04016
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Grey	DR05017
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Key Clamp Extended 3WayTee



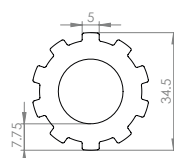
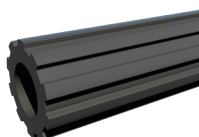
Weight	0.34kg/m
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Part Codes

Yellow	DR05021
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Grey	DR05020
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Spigot Tube



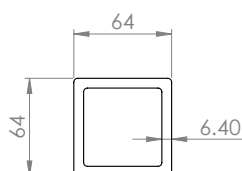
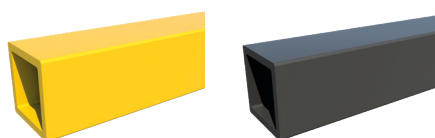
Weight	0.2kg/m
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Length	300mm
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Part Codes

Grey	DR02035
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DuraProfile Box 64 x 64 x 6.4



Weight	2.78kg/m
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Length	6m
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Part Codes


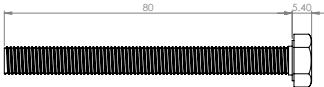
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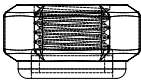
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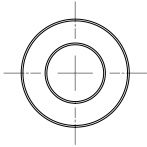


Fixings

Main Fixings		
Fixing	Technical Information	Fixing Information
<p>M6 St/316 Key Clamp Popnut and Bolt x55 (pack of 25)</p> 	 <p>Bolt</p>  <p>Popnut</p>	<p>Please note: both 6mm and 9mm Drill Bits are required (not supplied)</p> <p>Part Codes</p> <p>BFX01034</p>

Post Oblique Base Fixings		
Fixing	Technical Information	Fixing Information
<p>M8 Hex Head Set Screw (pack of 50)</p> 		<p>Part Codes</p> <p>BFX02114</p>

<p>M8 Nyloc Nut (pack of 100)</p> 		<p>Part Codes</p> <p>BFX02117</p>
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<p>M8 Standard Washer (pack of 100)</p> 		<p>Part Codes</p> <p>BFX02137</p>
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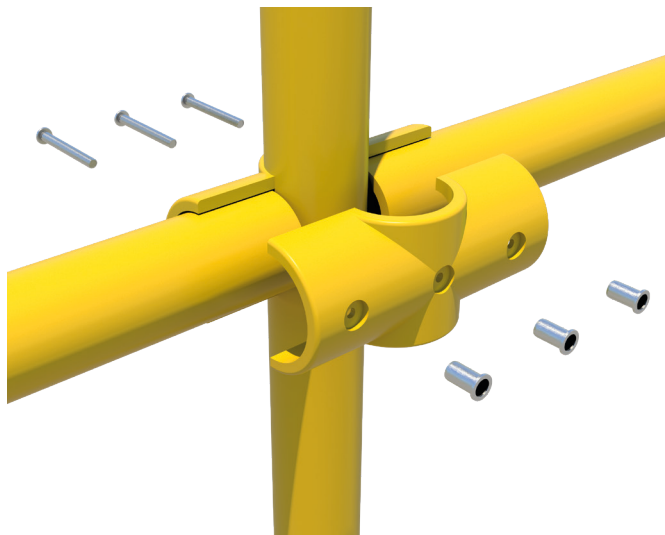
Assembly Example

Exploded views of Key Clamp Tee section assembly to show appropriate fixing positions denoted by counter-bore points.

Exploded View of Key Clamp 3WayTee Assembly

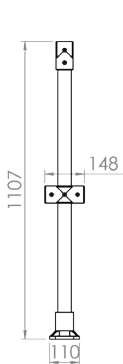
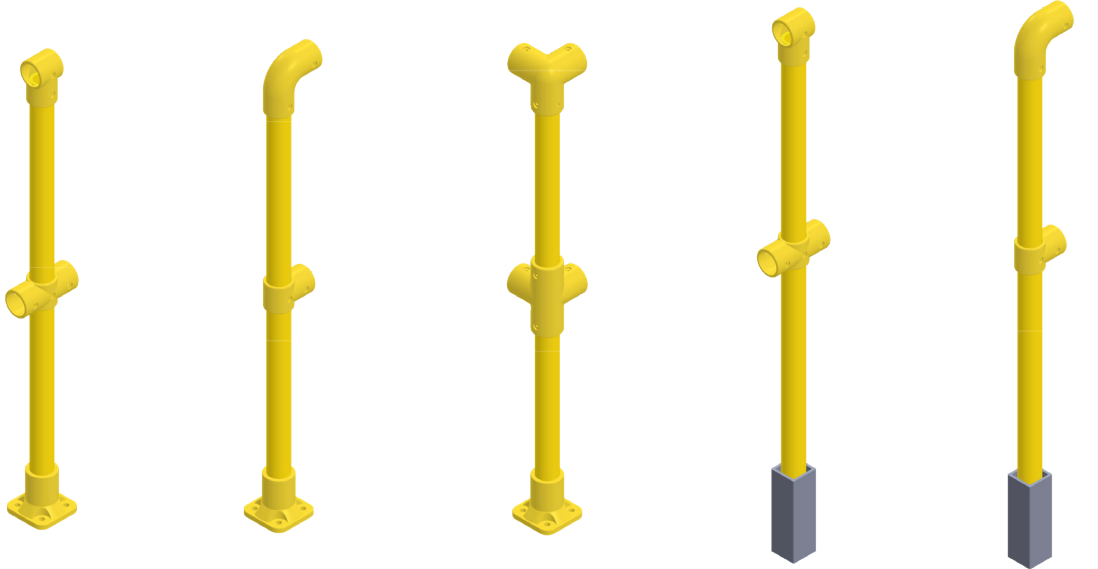


Exploded View of Key Clamp 4WayTee Assembly

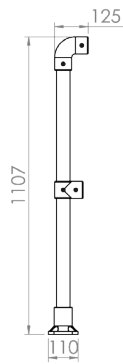


Pre-Assembled Parts

Dura Composites now offer pre-assembled 1.1m high handrail components in a waterproof palletised crate system. Pre-assembling 3 key parts (Mid Upright-Side Mount, End Upright-Side Mount, Mid Upright-Top Mount) not only speeds up deliveries but adds huge improvements to on-site installation speed.



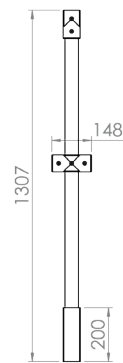
Mid Upright



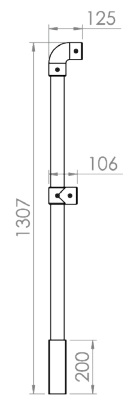
End Upright



**Mid Upright
(Top Mount)**



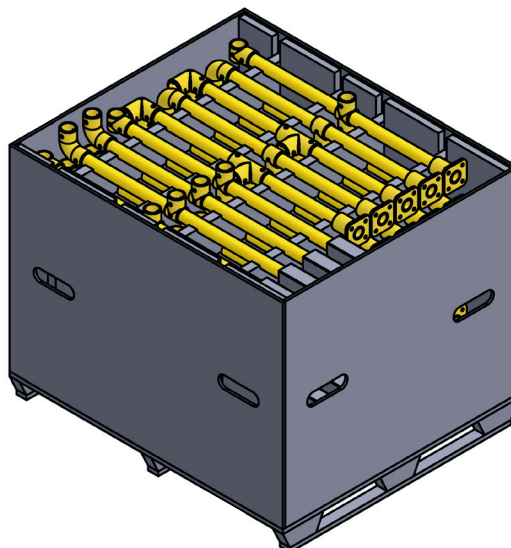
Side Upright*



Corner Upright*

*Longer lead times may apply for these types.

Supplied from stock, arrives partially assembled in a waterproof palletised system.



Data



Technical Specification

Composition

Pultruded Profiles:

Glass fibre, isophthalic polyester resin, inert fillers, UV stabilisers, promoters and flame retardants. Chemical pigment is mixed in to the resin to produce the final colour, therefore the finish is natural and requires no painting.

Loading Data

The system has been tested and satisfies the load and deflection requirements of: BS EN ISO 14122-3:2001 and BS 6180:2011 Table 2. For handrails 1100mm high and posts up to 1200mm.

Chemical Resistance

Chemical resistance data for a wide variety of substances is available. The standard handrail exhibits excellent resistance properties when exposed to many common chemicals for example citric acid, calcium chloride, fresh/salt water, ethylene glycol oil and petrol. It is not recommended for continued exposure to high concentrations of acids and alkalis. Further details are available on request. Please check before specifying into highly aggressive environments, where an alternative resin based product may need to be utilised.

Operating Temperature Range

Operating temperature range of a minimum -50°C to a maximum of +100°C.

Fire Resistance

Structural Profiles

BS476 part 7 Class 2: Surface Spread of Flame



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» for Safety Handrailing

Due to our policy of continual improvement we reserve the right to change specifications at all times without prior notice.

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