Captrad Composites modular handrail system consists of a 50mm grp pultruded tube in 5m lengths that fit exactly into the comprehensive range of matching grp moulded fittings. The fittings connect to the tube with bolts passing through both parts of the fitting and the tube. The bolt head and the nut recess into the fitting so there are no exposed edges to catch the hand of the user. The handrail system has been independently tested by the Engineering Dept at Lancaster University. Their tests confirm that the handrail system meets all the requirements of BS4592:0 2006+A1 2012 Industrial flooring, stairs and handrails for the general duty (0.36kN/m). We recommend a maximum span between stanchion centres of 1.25m.

The modular handrail system offers a cost effective alternative to conventional metallic materials (stainless steel or galvanized mild steel). The system offers benefits in:

- Very easy to install – simple to cut to length, easy to drill with hand tools – no need to seal cut ends
- Special bolt set where both the bolt head and nut recess within the moulding reducing the risk of hands or clothing catching on exposed fixing
- Excellent corrosion and weather resistance – no concerns about damage to any coating leading to corrosion
- Light weight (1/4 of the weight of steel) so much easier to manhandle to limited access sites
- Very low thermal conductivity – seen as warm to the touch compared to steel
- No recycle value so much reduced risk of theft.
- Electrically non-conductive
- Available in colours yellow and grey as standard – other colours could be made to order
The maximum continuous operating temperature is 90°C but short term exposure up to 130°C will not affect the handrail mechanical properties. Made from fully cured cross linked thermosetting resins, the handrail system does not soften or distort at the maximum operating temperatures and is not embrittled by low temperatures and can be safely used down to -50°C.

Operating Temperature Range

The modular handrail system will have a design life of +20 years in normal industrial environments. Some fading of colour shade will take place over time but this does not affect the structural performance of the handrail system. Little or no maintenance is expected to be required over the service life but minor damage can be repaired by sanding off any exposed fibre and painting with a good quality paint (epoxy or PU paints recommended).

Service Life & Maintenance

Diamond tipped saws blades are recommended for cutting the handrail tubes and toe plate but abrasive disc cutters can also be used. Drilling requires only hand tools with conventional HSS drills. The dust generated is non-toxic but can be a skin irritant. Suitable dust extraction should be used to minimize airborne dust and operators equipped with suitable protective clothing. A safety data sheet is available on request.

Cutting, Drilling & Machining

The tube is used for the stanchions, handrail and knee rail. Both the tube and the Toe plate (Kick board) are made by the pultrusion process giving very high strength to weight ratio with the polyester surface veil backed by continuous strand mat giving excellent resistance to weathering and the scuff, scratches on normal industrial use. The moulded fittings are all made by hot pressed moulding in metal tools giving excellent dimensional consistency and good surface finish.

Technical Description

Diamond tipped saws blades are recommended for cutting the handrail tubes and toe plate but abrasive disc cutters can also be used. Drilling requires only hand tools with conventional HSS drills. The dust generated is non-toxic but can be a skin irritant. Suitable dust extraction should be used to minimize airborne dust and operators equipped with suitable protective clothing. A safety data sheet is available on request.

Cutting, Drilling & Machining

All the raw materials used to make the modular handrail system comply with the relevant ISO or EN product specification standards. The pultruded tube and toe plate are made with a high grade isophthalic polyester resin reinforced with E glass fibre roving, woven fabric and continuous filament mat and includes a polyester surface veil. The moulded fittings are made from a proprietary sheet moulding compound which includes chopped E glass fibre, isophthalic polyester resin and mineral filler.

Raw Materials

The modular handrail system exhibits excellent resistance to a wide range of chemicals including acids, alkalis, fresh and salt water, ethylene glycol, petrol and other fuel oils. It is not recommended for extended exposure to concentrated acids or alkalis.

Chemical Resistance

The full range of the modular handrail system is available in safety yellow and a more limited range in a steel grey colour.

Colour

Tel: 01695 280510 sales@captrad.com
## CAPTRAD COMPOSITES

### TU5501Y 50mm/40mm Tube

<table>
<thead>
<tr>
<th>Colour Code</th>
<th>Product Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>TU5501Y</td>
<td>-</td>
</tr>
</tbody>
</table>

3 x 40mm G/P pultruded tube 15mm wall 258mm lengths that fit neatly into a comprehensive range of matching G/P moulded fittings.

### 3 Way Connection (Tee)

<table>
<thead>
<tr>
<th>Colour Code</th>
<th>Product Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow &amp; Grey</td>
<td>MH3W</td>
<td>0.22kg</td>
</tr>
</tbody>
</table>

Used to make a 90deg connection (Tee) of the handrail tube to the handrail post. Can also be used to join the handrail post at the end of a new rail tube. It is not recommended to use this fitting to join lengths of handrail tube - use the tubular strap joint.

### Corner 3 Way

<table>
<thead>
<tr>
<th>Colour Code</th>
<th>Product Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow &amp; Grey</td>
<td>MHCORNER3W</td>
<td>0.55kg</td>
</tr>
</tbody>
</table>

Used to make a 3 way 90deg joint between handrail and handrail post. Three bolts are required for this fitting. The fitting is 4 parts. The upper part and is also used for the right angle bend (code MHPART2) and the lower part is also used in the 4 way corner post code MHCORNER4W.

### Round Hole Base Foot

<table>
<thead>
<tr>
<th>Colour Code</th>
<th>Product Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow &amp; Grey</td>
<td>MHBF</td>
<td>0.51kg</td>
</tr>
</tbody>
</table>

Used as the structural base plate for each post. Minimum recommended post spacing is 1.2m. The post fitting sits into the base foot and should be secured using M10 bolts with penny washers and M10 penny washers & nut. There are no pre-moulded slits to show where the nuts are or drilled so as not to deflect in or create any movement in the hole when the set is in and hit off.MMC/R. Screw shank connector and matching universal connector plus the universal connector to fit over the tube - this is half of a universal joint. Two bolts are required to join the stud and universal joint connector. The universal connector can either be adhesive bonded in the tube or riveted.

### Triangle Foot Base

<table>
<thead>
<tr>
<th>Colour Code</th>
<th>Product Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>MHAFB</td>
<td>0.45kg</td>
</tr>
</tbody>
</table>

Used as a wall fixing plate either to terminate a run of handrail into a wall or to provide together with a 3 way tee connection a run of handrail along a wall. It can also be used as the base foot to start it - allows the foot to be fitted closer to the edge of the wall when terminating a possible with the standard base foot.

### Universal 3 Way

<table>
<thead>
<tr>
<th>Colour Code</th>
<th>Product Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow &amp; Grey</td>
<td>MH3WUY</td>
<td>0.56kg</td>
</tr>
</tbody>
</table>

A very versatile fitting that is used as a variable angle connection between handrail and handrail post in ramps and can be fitted to full range of angles. It can also be used in the alternative to the 3 way tee fitting as an angle range from 90deg is needed. It can also provide a variable angle in the handrail levels or to terminate posts or one handrail fitting made up of 2 parts. Universal shank connector and matching universal connector plus the universal connector to fit over the tube - this is half of a universal joint. Two bolts are required to join the stud and universal joint connector. The universal connector can either be adhesive bonded in the tube or riveted.

### Universal 4 Way

<table>
<thead>
<tr>
<th>Colour Code</th>
<th>Product Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow &amp; Grey</td>
<td>MH4WUY</td>
<td>0.96kg</td>
</tr>
</tbody>
</table>

A very versatile fitting that is used as a variable angle connection between handrail and handrail post in ramps and can be fitted to full range of angles. It can also be used in the alternative to the 3 way tee fitting as an angle range from 90deg is needed. It can also provide a variable angle in the handrail levels or to terminate posts or one handrail fitting made up of 4 parts. Three upper universal joint plus the universal connector to fit over the tube - this is half of a universal joint. Two bolts are required to join the stud and universal joint connector. The universal connector can either be adhesive bonded in the tube or riveted.

### 60 Degree 3 Way Connector

<table>
<thead>
<tr>
<th>Colour Code</th>
<th>Product Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>MHA3E</td>
<td>0.24kg</td>
</tr>
</tbody>
</table>

Used to make a connection (3 way) of the handrail tube to the handrail post at 30 deg - standard angle (10mm for starters). Can also be used to join the handrail post at the end of stairs to the lower hand rail. The connection post must have a 60 Deg angle to enable the tube to fully insert and be fixed into position. It is not recommended to use this fitting to join lengths of handrail tube - use the tubular strap joint.

### 60 Degree 4 Way Connector

<table>
<thead>
<tr>
<th>Colour Code</th>
<th>Product Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>MHA4E</td>
<td>0.32kg</td>
</tr>
</tbody>
</table>

Used to make a connection of the handrail tube to the handrail post at 30 deg - standard angle (10mm for starters). The connection post must have a 60 Deg angle to enable the tube to fully insert and be fixed into position. It is not recommended to use this fitting to join lengths of handrail tube - use the tubular strap joint.

### Modular Bolt Set

<table>
<thead>
<tr>
<th>Colour Code</th>
<th>Product Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>MHBOLT</td>
<td>2kg/100</td>
</tr>
</tbody>
</table>

The bolt set allows an M6 x 50 stainless steel bolt with a button head together with a nylon washer. The bolt set allows the moulded fittings. The side of the fitting taking the bolt is slotted to take the M6 bolts and the bolt head fits within the moulded recess in the fitting. The side of the fitting taking the nut requires a 6mm diameter hole to accept around both the fitting and the tube and the nut fits within the moulded recess in the fitting. In this way both the bolt head and the nut recess into the fitting so there are no exposed edges to catch the handrail thresher and not thing snagging on clothing.

### Base Foot Bolt

<table>
<thead>
<tr>
<th>Colour Code</th>
<th>Product Code</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>MHBOLTBF</td>
<td>0.07kg</td>
</tr>
</tbody>
</table>

The bolt set sits on a M10 x 50 stainless steel bolt with two stainless steel washers and a nut. This bolt set is specifically used for new standard handrails and is inserted using a proprietary base foot to attach the base foot to the handrail post. The base foot must be drilled with a 7mm drill bit in the moulded recess in the base foot and the tube. The bolt is put through with a washer on either side of the foot.

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### CAPTRAD COMPOSITES

#### 4 Way Connection
- **Colour:** Yellow & Grey
- **Product Code:** MH4W
- **Weight:** 0.29kg

(Used to make a 90 degree connection (cross) at the knee rail tube to the stanchion post. The stanchion post must be a continuous length from base to handrail. Knee rail tubes cut to length to fit between successive stanchion posts.)

#### 90 Degree Elbow
- **Colour:** Yellow & Grey
- **Product Code:** MH90E
- **Weight:** 0.36kg

(Used to make a 90 degree elbow to a handrail or joining the handrail to the stanchion post. Also used to make a 90 degree turn to raise a handrail. The fitting is also used as the top half of the 2 way corner fitting.)

#### Long 3 Way Connector
- **Colour:** Yellow
- **Product Code:** MHL3WY
- **Weight:** 0.30kg

(Used to make a 90 degree connection (cross) at the handrail tube to the stanchion post. Can also be used to join the stanchion post at the end of a run to the knee rail tube. Fitting can be used to join lengths of handrail tube instead of using a modular spigot junction.)

#### Right Angled Bend
- **Colour:** Yellow & Grey
- **Product Code:** MHRABY
- **Weight:** 0.41kg

(Used to make a sharp 90 degree bend to a handrail or joining the handrail to the stanchion post. Also used to make a sharp 90 degree turn to raise a handrail. The fitting is also used as the top half of the 2 way corner fitting.)

#### Side Fit
- **Colour:** Yellow & Grey
- **Product Code:** MHFS
- **Weight:** 0.465kg

(Used as a structural base for the stanchion post when fitted to side of stairs, amp or walkway. The base of the fitting is shaped so that the tube does not pass through. The side fit has a pinch fit to the tube so that when clamped tight to the side it holds the tube in place. Care is needed not to over tighten the bolts which could cause the fitting to crack. Loose washers should be used to prevent the movement of the fitting. The holes in the side fit base are 10mm diameter. The type of bolt to be used depends on the substrate to which it is to be fixed.)

#### Modular Toe Plate
- **Length:** 5m
- **Colour:** Yellow
- **Product Code:** MHTP
- **Weight:** 1.3kg/m

(The bottom edge of the toe plate rests on the edge of the stanchion base foot. This gives the required gap for water drainage and complies with the requirement of BS814121:3 where the gap between the edge of the toe plate and the floor should be no more than 15mm. The toe plate is bolted to the stanchion post base foot and to the stanchion post.)

#### Universal Joint
- **Colour:** Yellow & Grey
- **Product Code:** MHUJ
- **Weight:** 0.49kg

(Used to allow a change of angle of handrail and knee rail on any stair and any angle. The universal joint fits over the tube. The tube can be adhesive bonded in place or bolted. A bolt is required on the stanchion connection.)

#### 120 Degree Elbow
- **Colour:** Yellow
- **Product Code:** MHA120E
- **Weight:** 0.32kg

(Used to make an end to a dual handrail joining the handrail to the stanchion post at 120 degree - standard angle (slope) or plains.)

#### P Joint
- **Colour:** Yellow & Grey
- **Product Code:** MHPJ
- **Weight:** 0.62kg

(Used primarily when installing modular handrail around a close with a 90 degree turn. Can be used as part of a handrail gait or a sidewalk hinge.)

#### Spigot
- **Colour:** Yellow & Grey
- **Product Code:** MHSPIGOTY
- **Weight:** 0.19kg

(A 300mm length of tube 30mm od is to form a joint between lengths of handrail tube. The joint between the tubes is secured with 2 box bolts. Note that the bolts required for this fitting are 6mm long standard bolt set & 60mm long. Both are included.)

#### Base Foot Pad 5mm
- **Colour:** Black
- **Product Code:** MHFF5MM
- **Weight:** 0.10kg

(This 5mm rubber pad is to be used with our base foot MH4F. When installing the base foot on uneven ground the post can be placed under the base foot before fixing the base foot to the ground. The rubber pad helps to even out uneven ground to give a solid base.)

#### Tube End Cap
- **Colour:** Black
- **Product Code:** TU624CAP
- **Weight:** 2kg/100

(Plastic tube end designed to knock into the end of the tube. The tops of the inserts are designed to fit flush with the outside of the tube.)

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