Warren and Brown commenced manufacturing operations in Melbourne, Australia in 1921. Over the years we have successfully designed and produced a range of products for the automotive, medical, health and fitness markets. A strong focus on developing products for global markets has provided exciting challenges and solid growth. As the company evolved and grew over the years, Warren & Brown developed a revolutionary range of innovative and highly functional products for the telecommunications industry.

The Lightpaths Fiber Optic Management System now forms the dynamic focus of our business and Warren and Brown Technologies is recognised globally as a leading manufacturer and supplier of quality telecommunications solutions and equipment. WBT products include equipment racks, splice trays and enclosures, patch panels, distribution and termination frames and plastic ducting systems for routing and protection of optical fibers.

The company has modern, well equipped manufacturing plants throughout Australia and South East Asia, which operate under Third Party certified quality management systems.

The Warren & Brown Technologies design team is committed to the dynamic development of the product range in order to meet the ever changing needs of our customers throughout the world, including the United Kingdom, Europe, Eastern Europe, Russia, North America, the Middle East and Asia.

Warren & Brown Technologies’ focus on rapid, market driven product design and development allows us to offer unique innovative and market leading optical fiber solutions to customers around the world.
WBT Fiber Optic Ducting-Raceway

Contents

Introduction 4-5
Designing a WBT Solution 6-9

WBT Components
- Ducting~Raceway System 10
- Joiners 10
- Elbows 11
- Tees & Crosses 12
- Fiber Storage 13
- End Caps 13
- Adaptors 13
- Reducers and Tubing 14
- Side Drop-off Kits 15

WBT Solutions
- Side Drop-off Kits 15-16
- Drop Components 16
- High Density Outlets 17
- Low Profile Duct Solution 18
- Metal Mountings 19-21
- Miscellaneous Items 22
- Tooling 22-23
- Tool Kit Components 24
- Other WBT Products 25-26
- Glossary of Terms 27
- Contact Details Back Page

DRIVING FIBER FURTHER
Fiber optic cords carry far more services and much greater throughput than traditional copper services and downtime or outages can cost tens of thousands of dollars per second in lost revenue for each cord damaged. Good fiber protection is absolutely essential. Fiber cords are fragile and need to be correctly protected throughout any cabling installation from end to end. Traditional cable routing on open cable trays and ladders may cause damage to the delicate fiber cables. These methods of routing cables provide no protection for the exposed fiber.

High risk, poor (spaghetti optics) cable management (lack of management)

Fiber cords need to be segregated from all copper services and routed in enclosed duct~raceway, clearly defined by means of a bright distinctive colour. They also need protection against compression, and the minimum bend radius, generally specified as 30mm (1.25”) must not be compromised.

Fiber optic ducting~raceway is the best way to safely route cords and clearly segregate them from other services. In selecting a ducting~raceway system for fiber optic cords many factors need to be considered:

1. Labour costs incurred in installing cabling infrastructure in telecommunications exchanges or data centres can be very expensive if the system chosen is not easy to install.

2. All plastic based products used should be self-extinguishing and halogen free to avoid the risk of harming staff, transmission equipment, rescuers or buildings in the case of a fire.

3. All plastic based products should be ROHS compliant

4. The need for zero down-time when using optical fiber. The system chosen should be easily changed or extended without the need to remove the existing fiber or shut down services.
WBT’s fiber optic ducting~raceway is a unique system for routing and protecting fiber optic cords between termination equipment, patch panels and fiber optic splicing cabinets or frames in telecommunications exchanges, data centres, universities, hospitals, or anywhere fiber optic cabling is present. Easily mounted above equipment racks or below floors, it provides an easily accessible solution to any situation.

Available in 6 sizes in solid wall or slotted wall for exiting fibers, with the largest range of connecting components and mounting hardware available. The WBT ducting~raceway system provides a solution to any fiber routing application.

WBT components simply snap together or can be joined with "slotless" joiners. Vertical drops can be positioned or added easily by adding a cutout in the horizontal duct~raceway with a simple to operate hand tool.

The unique design of the WBT system protects the fiber from damage and ensures that the bend radius of the cable is not compromised.

All components in the WBTs system are manufactured from Noryl, a very strong plastic, which is self extinguishing and halogen free (certified to UL94-VO specification) which means in the case of a fire, the gases emitted will not cause harm to personnel, buildings or transmission equipment, unlike some other brands of ducting.

WBT fiber optic ducting~raceway products are manufactured to the highest quality standards (ISO9001), complying with the stringent requirements of ULA2024A & ROHS and carry a 5 year warranty.

**Why use the WBT Fiber Optic Ducting~Raceway System**

**WBT Ducting/Raceway items, conform to the following standards:**
- ISO 9001 Certified Quality Management System by NCS International
- Fire retardent plastic, Halogen Free, UL94-VO rated
- UL2024A standard
- EEU - ROHS requirements
Design & Selection Procedure For Raceway System

1. Colour Coding for Optimum Cable Management

With the ever increasing demand for zero down-time solutions in data centers and Telecommunications networks there has been a growing need for redundancy cable systems.

To route both operating and redundant optic fibers in the yellow coloured ducting can create problems in identification of the redundant fiber and/or system. As a result there is an obvious need to differentiate between the operating and redundant networks of fiber optic cabling. To minimise the potential for costly mistakes in this area, Warren & Brown Technologies have introduced Orange ducting which is recommended for highlighting the redundant fiber network, thereby improving maintenance efficiency.

Orange Ducting is recommended for highlighting the redundant fiber network

Parallel to the redundancy needs, a new issue has arisen in installations. The state-of-art 10 Gigabit copper UTP cabling also has very high demands on bend radius. This requires a new approach to the conventional metal cable trays (ladders, baskets etc). The conventional metal trays are not designed to provide safe bending radius and as a result Warren & Brown Technologies has introduced Black Ducting.

Again, this new black WBT ducting has the same unique features and benefits of the yellow and orange ducting and allows clear distinction of the sensitive 10 Gigabit copper UTP cabling from the two WBT optic fiber systems.

Black ducting is recommended for use with UTP 10 Gigabit copper

All part numbers listed in the catalogue are for Yellow ducting, so when ordering black or orange ducting just add “O” for orange or “B” for black to the end of the relevant part number. We also have available a range of grey duct. For this just add “G” to the part number.

DRIVING FIBER FURTHER
2. Selecting the Ducting - Raceway size

WBT ducting~raceway is available in six sizes. **It is most important to select a size that allows for expansion and future additions to the ducting system.**

All too often cable systems are underspecified in order to reduce installation costs. In this world of the ever increasing need for the storage and processing of data it is false economy to just specify for existing needs. It is ultimately most cost effective to provide for the future and over specify when it comes to capacity.

Cable exit points and take offs also need to be taken into account as these components have different capacity ratings to the main ducting~raceway.

The capacities listed below are recommended to ensure no damage will occur to the cords due to crushing. This is not the number of optical fiber cords that the ducting~raceway will accommodate if completely filled.

<table>
<thead>
<tr>
<th>Duct size millimetres / mm</th>
<th>30 x 30</th>
<th>50 x 50</th>
<th>100 x 50</th>
<th>220 x 100</th>
<th>300 x 100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Duct size inches / in</td>
<td>1.25 x 1.25</td>
<td>2 x 2</td>
<td>4 x 2</td>
<td>8 x 4</td>
<td>12 x 4</td>
</tr>
<tr>
<td>Optical Cable size / mm</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Capacities</td>
<td>2-2.4</td>
<td>2-2.4</td>
<td>2-2.4</td>
<td>2-2.4</td>
<td>2-2.4</td>
</tr>
<tr>
<td>Straight Duct-Raceway</td>
<td>45</td>
<td>120</td>
<td>250</td>
<td>1100</td>
<td>1500</td>
</tr>
<tr>
<td>Duct-Raceway with Ramp-off</td>
<td>60</td>
<td>155</td>
<td>350</td>
<td>1500</td>
<td>2100</td>
</tr>
<tr>
<td>Vertical Tee - Straight Through</td>
<td>100</td>
<td>265</td>
<td>600</td>
<td>2600</td>
<td>3600</td>
</tr>
<tr>
<td>Vertical Tee Downspout - Drop</td>
<td>250</td>
<td>300</td>
<td>500</td>
<td>300</td>
<td>500</td>
</tr>
<tr>
<td>Over the top Outlet</td>
<td>600</td>
<td>500</td>
<td>700</td>
<td>700</td>
<td>700</td>
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<tr>
<td>Convoluted Tubing</td>
<td>Split 20mm dia.</td>
<td>Split 38mm dia.</td>
<td>Split 50mm dia.</td>
<td>50 x 50 square</td>
<td></td>
</tr>
<tr>
<td>Optical Cable size / mm</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Tubing Capacities</td>
<td>2-2.4</td>
<td>2-2.4</td>
<td>2-2.4</td>
<td>2-2.4</td>
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<tr>
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<td>1.6-2</td>
<td>1.6-2</td>
<td>1.6-2</td>
<td>1.6-2</td>
<td></td>
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<tr>
<td></td>
<td>1.6-2</td>
<td>1.6-2</td>
<td>1.6-2</td>
<td>1.6-2</td>
<td></td>
</tr>
</tbody>
</table>
WBT ducting~raceway can be mounted from walls, ladder rack, unistrut, on raised floor support brackets, on floors, or to the top of equipment racks of frames. Select an appropriate mounting method from the examples shown below otherwise you can contact your WBT sales office or distributor for additional mounting options and custom solutions.

### 3. Ducting - Raceway mounting

Select the appropriate dropper or outlet method from the following examples.

- **Round convoluted tube**
- **Square convoluted tube**
- **Trumpet**
- **Solid Duct**
- **Fiber Cords can be simply routed via Ramp Off into or out of the Ducting**
- **Cords can easily pass through the ducting to the next drop point or exit**
- **Single or Dual High Density Convoluted Tube outlets**

**Example**
5. Draw plan

Draw plan view of room/area where ducting~raceway is required. Include cabinet sizes and positions as well as ladder racks, cable trays or Air conditioning ducts. Denote duct size required in each area. Mark ducting~raceway support bracket locations. The recommended spacing for mounting brackets is 900mm or 1.2 Metres maximum.

For copper systems use 600mm spacing. Brackets should be mounted close to the joiners if possible. Draw a side view of all areas where the ducting~raceway changes level or mounting system needs to change.

6. Materials List

List all components required by part number and quantity from the following pages. Note: Ensure that all components including joiners, mounting hardware, end caps, convoluted tube etc. are included.

We recommend including 10% more joiners and brackets.
WBT’s straight ducting–raceway is available in six sizes with or without covers. Slotted duct/raceway is available in some sizes for vertical drops or applications inside equipment racks to allow cords to exit through the side of the duct. Some sizes are available with hinged covers (hinges included in pack), or clip on covers. All duct sizes come in 2 metre (6.3’) lengths, and where required, are slotted at each end for simply snapping together with an appropriate joiner. Most other ducting - raceway brands are only available in 6 foot lengths - 10% shorter than Lightpaths.

<table>
<thead>
<tr>
<th>Size Millimetres</th>
<th>Size Inches</th>
<th>Solid duct</th>
<th>Solid duct &amp; cover</th>
<th>Solid duct &amp; hinged cover</th>
<th>Slotted duct (side exit)</th>
<th>Slotted duct &amp; cover</th>
<th>Slotted duct &amp; hinged cover</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 x 30</td>
<td>1.25” x 1.25”</td>
<td>TC1279-83</td>
<td>TC1279-83XA</td>
<td>TC1279-83A*</td>
<td>TC1279-83SL</td>
<td>TC1279-83SLXA</td>
<td>TC1279-83SLA*</td>
</tr>
<tr>
<td>50 x 50</td>
<td>2” x 2”</td>
<td>TC1279-81</td>
<td>TC1279-81XA</td>
<td>TC1279-81A*</td>
<td>TC1279-81SL</td>
<td>TC1279-81SLXA</td>
<td>TC1279-81SLA*</td>
</tr>
<tr>
<td>100 x 50</td>
<td>4” x 2”</td>
<td>TC1279-223</td>
<td>TC1279-223ASN</td>
<td>TC1279-223A</td>
<td>TC1279-223SL</td>
<td>TC1279-223SLASN</td>
<td>TC1279-223SLA</td>
</tr>
<tr>
<td>100 x 100</td>
<td>4” x 4”</td>
<td>TC1279-23</td>
<td>TC1279-23ASN</td>
<td>TC1279-23A</td>
<td>TC1279-23SL</td>
<td>TC1279-23SLASN</td>
<td>TC1279-23SLA</td>
</tr>
<tr>
<td>220 x 100</td>
<td>8’ x 4”</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>300 x 100</td>
<td>12” x 4”</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

* comes with 8 shorter clip on covers

**Joiners**

WBT joiners are used to snap together system components and straight ducting–raceway. They simply snap into the slots in the end of each piece to be joined. Note: For straight ducting–raceway that has been cut to length, new slots need to be made with a suitable size slotting tool.

*Slotless* joiners are now available in sizes from 100 x 100mm upwards and will join the ducting–raceway components with or without joining slots.

TC1279-320KIT - 300mm 'slotted' joiner allows metal mounting bracket to be mounted / attached using 2 X M8 cage nuts already installed in the joiner.
Vertical Elbows

WBT vertical elbows are used to connect horizontal routes at different height, or to allow the fiber path to be raised or lowered to avoid obstacles. Retrofit versions are used where there is existing fiber. They are available with or without covers.

### Size Millimetres

<table>
<thead>
<tr>
<th>Elbow Type</th>
<th>Size Millimetres</th>
<th>Size Inches</th>
<th>Model Code TC1279</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30° down</td>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
<td>TC1279-135-30</td>
<td>N/A</td>
</tr>
<tr>
<td>30° down &amp; cover</td>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
<td>TC1279-135-30A</td>
<td>N/A</td>
</tr>
<tr>
<td>30° down retrofit</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>30° up</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>30° up &amp; cover</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>30° up retrofit</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>45° down</td>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
<td>TC1279-135-45</td>
<td>N/A</td>
</tr>
<tr>
<td>45° down &amp; cover</td>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
<td>TC1279-135-45A</td>
<td>N/A</td>
</tr>
<tr>
<td>45° down retrofit</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>45° up</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>45° up &amp; cover</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>45° up retrofit</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>90° down</td>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
<td>TC1279-135</td>
<td>N/A</td>
</tr>
<tr>
<td>90° down &amp; cover</td>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
<td>TC1279-135A</td>
<td>N/A</td>
</tr>
<tr>
<td>90° down retrofit</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>90° up</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>90° up &amp; cover</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>90° up retrofit</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
<tr>
<td>90° up &amp; down enclosed</td>
<td>N/A</td>
<td></td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Horizontal Elbows

WBT Horizontal Elbows are used to change the direction of horizontal routes. They are available with or without covers.

### Size Millimetres

<table>
<thead>
<tr>
<th>Elbow Type</th>
<th>Size Millimetres</th>
<th>Size Inches</th>
<th>Model Code TC1279</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30° elbow</td>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
<td>TC1279-137-30</td>
<td>N/A</td>
</tr>
<tr>
<td>30° elbow &amp; cover</td>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
<td>TC1279-137-30A</td>
<td>N/A</td>
</tr>
<tr>
<td>45° elbow</td>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
<td>TC1279-137-45</td>
<td>N/A</td>
</tr>
<tr>
<td>45° elbow &amp; cover</td>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
<td>TC1279-137-45A</td>
<td>N/A</td>
</tr>
<tr>
<td>90° elbow</td>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
<td>TC1279-137</td>
<td>N/A</td>
</tr>
<tr>
<td>90° elbow &amp; cover</td>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
<td>TC1279-137A</td>
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</tr>
</tbody>
</table>
Horizontal Tees

WBT Horizontal Tees may be used to branch off the main route or provide a method of breaking into Horizontal Duct. They are available with or without covers.

<table>
<thead>
<tr>
<th>Size Millimetres</th>
<th>Size Inches</th>
<th>TC1279-115</th>
<th>TC1279-75</th>
<th>TC1279-224</th>
<th>TC1279-03</th>
<th>TC1279-01</th>
<th>TC1279-279</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
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<tr>
<td>50 x 50</td>
<td>2&quot; x 2&quot;</td>
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<td></td>
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<tr>
<td>100 x 50</td>
<td>4&quot; x 2&quot;</td>
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<tr>
<td>100 x 100</td>
<td>4&quot; x 4&quot;</td>
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<td></td>
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<tr>
<td>220 x 100</td>
<td>8&quot; x 4&quot;</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>300 x 100</td>
<td>12&quot; x 4&quot;</td>
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</tbody>
</table>

Vertical Tees (Downspouts) - Intrasuite Assemblies

WBT Vertical Tees can be used to drop cables vertically from horizontal routes into frames or cabinets. Retro fit tees provide open access and are used where cables are already in place. They are available with or without covers.

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</thead>
<tbody>
<tr>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Horizontal Crosses

WBT Horizontal Crosses can be used to provide a cross intersection in straight duct. Reduction crosses join horizontal duct of different sizes.

<table>
<thead>
<tr>
<th>Size Millimetres</th>
<th>Size Inches</th>
<th>TC1279-139</th>
<th>TC1279-234</th>
<th>TC1279-71</th>
<th>TC1279-61</th>
<th>TC1279-300</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>50 x 50</td>
<td>2&quot; x 2&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 x 50</td>
<td>4&quot; x 2&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 x 100</td>
<td>4&quot; x 4&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>220 x 100</td>
<td>8&quot; x 4&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>300 x 100</td>
<td>12&quot; x 4&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Fiber Storage Loops

WBT Fiber Storage Loops are used to safely store excess fiber length and can be placed in any horizontal route or inside cabinets. They are available in inline or offset versions.

<table>
<thead>
<tr>
<th>Size Millimetres</th>
<th>Size Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
</tr>
<tr>
<td>50 x 50</td>
<td>2&quot; x 2&quot;</td>
</tr>
<tr>
<td>100 x 50</td>
<td>4&quot; x 2&quot;</td>
</tr>
<tr>
<td>100 x 100</td>
<td>4&quot; x 4&quot;</td>
</tr>
<tr>
<td>220 x 100</td>
<td>8&quot; x 4&quot;</td>
</tr>
<tr>
<td>300 x 100</td>
<td>12&quot; x 4&quot;</td>
</tr>
</tbody>
</table>

**Inline Loop**

- TC1279-209KIT
- TC1279-186KIT
- TC1279-208KIT
- TC1279-192KIT
- TC1279-191KIT
- TC1279-315KIT

**Offset Loop**

- TC1279-178KIT
- TC1279-195KIT
- TC1279-197KIT
- TC1279-485KIT
- TC1279-315KIT

End Caps

WBT End Caps are used to close off the end of a horizontal or vertical route of duct. Some are sealed, others have knock outs or spigots for convoluted tubing or fiber feedout.

<table>
<thead>
<tr>
<th>Size Millimetres</th>
<th>Size Inches</th>
</tr>
</thead>
<tbody>
<tr>
<td>30 x 30</td>
<td>1.25&quot; x 1.25&quot;</td>
</tr>
<tr>
<td>50 x 50</td>
<td>2&quot; x 2&quot;</td>
</tr>
<tr>
<td>100 x 50</td>
<td>4&quot; x 2&quot;</td>
</tr>
<tr>
<td>100 x 100</td>
<td>4&quot; x 4&quot;</td>
</tr>
<tr>
<td>220 x 100</td>
<td>8&quot; x 4&quot;</td>
</tr>
<tr>
<td>300 x 100</td>
<td>12&quot; x 4&quot;</td>
</tr>
</tbody>
</table>

**Sealed**

- N/A
- N/A
- TC1279-227
- TC1279-57
- TC1279-56
- N/A

**Sealed (for use with slotless duct)**

- N/A
- N/A
- TC1279-51
- TC1279-252
- TC1279-288
- N/A

**1 x 17mm knockout**

- TC1279-128
- N/A
- N/A
- N/A
- N/A
- N/A

**2 x 20mm dia knockouts**

- TC1279-128D
- N/A
- N/A
- N/A
- N/A
- N/A

**2 x 38mm dia knockout**

- TC1279-127B
- N/A
- N/A
- N/A
- N/A
- N/A

**1 x 38mm cutout**

- TC1279-127C
- N/A
- N/A
- N/A
- N/A
- N/A

**Tube outlet for 44mm tube**

- TC1279-127D
- N/A
- N/A
- N/A
- N/A
- N/A

**2 x 32mm dia knockouts**

- N/A
- N/A
- N/A
- TC1279-57B
- N/A
- N/A

**2 x 46mm dia holes**

- N/A
- N/A
- N/A
- TC1279-57D
- N/A
- N/A

**End Support Bracket**

- N/A
- N/A
- N/A
- TC1279-456
- N/A
- N/A

**88mm Tube outlet**

- N/A
- N/A
- N/A
- N/A
- N/A
- N/A

**Dual 88mm Tube outlets**

- N/A
- N/A
- N/A
- N/A
- TC1279-457
- N/A

Adaptors

WBT Adaptors are used to connect parts from other brands to the Lightpaths ducting-raceway. Most other Ducting brands can be slotted with a lightpaths sloting tool to suit one of our slotted joiners.

- Adaptor kit 100 x 100 lightpaths to ADC 4"
  - TC1279-109KIT
- Adaptor kit Left hand lightpaths 220 x 100mm to ADC 6"
  - TC1279-149KIT
- Adaptor kit Right hand lightpaths 220 x 100mm to ADC 6"
  - TC1279-150KIT
- Speed Drop lightpaths to ADC
  - TC1279-307SKIT
- Adaptor kit lightpaths 300 x 100 to ADC 12"
  - TC1279-327KIT
- Adaptor kit Right hand lightpaths 100 x 100 to ADC 6"
  - TC1279-472KIT
- Adaptor kit Left hand lightpaths 100 x 100 to ADC 6"
  - TC1279-473KIT
- Adaptor kit Right Hand lightpaths 220 x 100 to Panduit 6"
  - TC1279-486KIT
- Adaptor kit Right Hand lightpaths 220 x 100 to Panduit 6"
  - TC1279-487KIT

TC1279-149KIT
Adaptor Kit Left hand lightpaths 220mm to ADC 6"
**Reducers**

WBT Reducers allow different size ducts to be joined together. They are available with or without covers.

<table>
<thead>
<tr>
<th>Main Size Reduction Size</th>
<th>50 x 50</th>
<th>30 x 30</th>
<th>100 x 50</th>
<th>50 x 50</th>
<th>100 x 100</th>
<th>50 x 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducer</td>
<td>TC1279-97</td>
<td>TC1279-238</td>
<td>TC1279-91</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reducer &amp; cover</td>
<td>TC1279-97A</td>
<td>TC1279-238A</td>
<td>TC1279-91A</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Tubing**

WBT Tubing is used for feeding entering or exiting fibers from the ducting~raceway into equipment racks. They are convoluted or ribbed to allow adjustment if drops cannot be positioned exactly over or under equipment. Some are available with removable covers, or split for ease of cable installation.

<table>
<thead>
<tr>
<th>Description</th>
<th>Yellow</th>
<th>Black</th>
</tr>
</thead>
<tbody>
<tr>
<td>Convoluted tube 50mm dia (1 meter length)</td>
<td>TC1279-26Y</td>
<td>TC1279-26</td>
</tr>
<tr>
<td>Convoluted tube 50mm dia (2 meter length)</td>
<td>TC1279-53Y</td>
<td>TC1279-53</td>
</tr>
<tr>
<td>Convoluted tube 25mm dia (2 meter length)</td>
<td>N/A</td>
<td>TC1279-54*</td>
</tr>
<tr>
<td>Convoluted tube 38mm dia (2 meter length)</td>
<td>N/A</td>
<td>TC1279-56</td>
</tr>
<tr>
<td>Convoluted tube 50mm square (350mm length)</td>
<td>TC1279-85YEL</td>
<td>TC1279-85BLK</td>
</tr>
<tr>
<td>Openable Conv. tube W/cover 50mm square (350mm length)</td>
<td>TC1279-85KIT</td>
<td>N/A</td>
</tr>
<tr>
<td>Convoluted tube 30mm square (350mm length)</td>
<td>TC1279-88</td>
<td>N/A</td>
</tr>
<tr>
<td>Convoluted tube split 20mm dia (2 meter length)</td>
<td>N/A</td>
<td>TC1279-100*</td>
</tr>
<tr>
<td>Convoluted tube split with cover 50mm dia (1 meter length)</td>
<td>N/A</td>
<td>TC1279-350</td>
</tr>
<tr>
<td>Convoluted Tube, Flexible, 75mm ID/88mm OD x 2 metres long</td>
<td>TC1279-458</td>
<td>N/A</td>
</tr>
<tr>
<td>Convoluted Tube, Flexible, 75mm ID/88mm OD x 1 metres long</td>
<td>TC1279-458-1</td>
<td>N/A</td>
</tr>
<tr>
<td>Convoluted Tube, Flexible, 83mm ID/65mm OD x 2 metres long</td>
<td>TC1279-471</td>
<td>N/A</td>
</tr>
<tr>
<td>Convoluted Tube, Flexible, 83mm ID/65mm OD x 1 metres long</td>
<td>TC1279-471-1</td>
<td>N/A</td>
</tr>
<tr>
<td>Convoluted Tube, Flexible, 75mm ID/88mm OD x 1.15 metres long</td>
<td>TC1279-479</td>
<td>N/A</td>
</tr>
<tr>
<td>Convoluted tube 63mm ID/65mm OD x 1.1 metres, c/w two joiners to connect to 75mm ID/88mm OD convoluted tube</td>
<td>TC1279-480A</td>
<td>N/A</td>
</tr>
<tr>
<td>Convoluted Tubing Adaptor Kit, 75mm ID/88mm OD to 44mm ID/50mm OD Tubing</td>
<td>TC1279-494KIT</td>
<td>N/A</td>
</tr>
</tbody>
</table>
Drop-Off Solutions

Side Drop-off Kits

These components provide different methods of allowing fibers to enter or leave the duct - raceway. They can be purchased as kits or as individual.

**Side drop off to 50mm dia. convoluted tube**

- **TC1279-41KIT**
  - 1 x Drop off connector
  - 1 x Spreader
  - 1 x Ramp up
  - This drop can fit about 80, 2.4mm cables

  Use tool TC1279-50KIT to make cut-out in side of duct

**Side drop off to 50mm square convoluted tube**

- **TC1279-89KIT**
  - 1 x Drop off connector
  - 1 x Spreader
  - 1 x Ramp up
  - This drop can fit between 100 - 150, 2.4mm cables

  Use tool TC1279-50KIT to make cut-out in side of duct

**Side drop-off to 50mm Ducting - Raceway**

- **TC1279-93KIT**
  - 1 x Break out
  - 1 x Ramp up
  - 1 x Joiner
  - 1 x Down Elbow
  - This drop can fit between 100 - 150, 2.4mm cables

  Use tool TC1279-50KIT to make cut-out in side of duct

**Side drop-off to 100 x 100mm Ducting-Raceway**

- **TC1279-111KIT**
  - 1 x Break out
  - 1 x Joiner
  - 1 x Down Elbow
  - This drop can fit between 500 - 600, 2.4mm cables

  Use tool TC1279-231KIT to make cut-out in side of duct
**Side Drop-off Kits**

Side drop-off to 100 x 50mm Ducting - Raceway

**TC1279-232KIT**

- 1 x Breakout
- 1 x Ramp Up
- 1 x Joiner

* Down Elbow not included in Kit. Required separately

P/N TC1279-236A

Use tool TC1279-231KIT to make cut-out in side of duct

Top Outlet drop-off to 100 x 100mm Ducting - Raceway

**Horizontal TC1279-290A**

- This drop can fit between 300 - 400, 2.4mm cables

Cut-out tool not required

**Vertical TC1279-307A**

- This drop can fit between 300 - 400, 2.4mm cables

Vertical Tees (Downspouts) See page 12

- **TC1279-63R**
- **TC1279-11A**
- **TC1279-11R**

**Drop Components**

- **TC1279-212KIT**
  - Radius guide
  - (Pack of 10) to suit 30, 50 & 100mm slotted duct
- **TC1279-42**
  - Ramp Up
- **Outlet trumpet**
  - TC1279-218A 100mm
  - TC1279-330A 220mm
  - TC1279-379A 300mm
- **TC1279-93A**
  - Outlet trumpet 50 x 50mm

- **TC1279-290A**
  - Top outlet
- **TC1279-307A**
  - Top outlet (With Slots)
- **TC1279-290ASL**
  - Top outlet (With Slots)
- **TC1279-307ASL**
  - Top outlet (With Slots)
Drop-off Solution - High Capacity Duct Outlets

These new Duct breakout kits provide the ideal solution for a high capacity fiber cord outlet. This solution provides a safe and effective means of protecting optic fiber cords and allows for easy routing of cords down into a Telecommunications frame. Duct outlets can be placed anywhere along the duct and minimal time and effort is required to install these outlet components. This solution allows for quicker installation as less cuts are required and is also stronger as the ribs of duct are not cut.

**TC1279-452A**
100mm x 100mm (4" x 4") 90deg Down Break Out
- Provides a 90 degree, down bend, (and break-out facility), at any point in a 100mm, 220mm or 300mm duct system
- Can accept any standard 220 x 100mm duct item using a joiner
- Kit includes:
  - TC1279-452 (90deg down body)
  - TC1279-453 (90deg down Lid)

**TC1279-452KIT**
100mm x 100mm (4" x 4") 90deg Down Break Out Kit
- Provides a 90 degree, down bend, tube in a 100mm, 220mm or 300mm duct system
- The 75mm ID/88 mm OD tube can carry either: 360 x 2mm cords; 210 x 2.4 mm cords; or 160 x 3mm dia cords maximum
- Kit includes:
  - 1x TC1279-452A
  - 1 x 2mt long Convoluted tube
  - 1 x TC1279-456 Convoluted tube outlet

**TC1279-454A**
220mm x 100mm (8" x 4") 90 Deg Down Break Out
- Provides a 90 degree, down bend, (and break-out facility), at any point, in a 100mm, 220mm or 300mm duct system
- Can accept any standard 220 x 100mm duct item using a joiner
- Kit includes:
  - TC1279-454 (90deg down body)
  - TC1279-455 (90deg down Lid)

**TC1279-454KIT**
220mm x 100mm (8" x 4") 90 Deg Down Break Out Kit
- Provides a 90 degree, down bend, for two large size convoluted tubes, in a 100mm, 220mm or 300mm duct system
- Each 75mm ID tube can carry either: 360 x 2mm cords; 210 x 2.4 mm cords; or 160 x 3mm dia cords, maximum.
- Kit includes:
  - 1x TC1279-454A
  - 2 x 2mt long Convoluted tubes
  - 1 x TC1279-457 Dual Convoluted tube outlet

**Outlet Adaptors for High Capacity Drop-off Solution**

- **TC1279-456**
  Outlet, 100mm x 100mm duct to single 88mm tube

- **TC1279-457**
  Outlet, 220mm x 100mm duct to dual 88mm tube

**Convoluted Tube**

- **TC1279-479**
  88mm OD, 75mm ID convoluted tube, 1150mm long

- **TC1279-480**
  75mm OD, 60mm ID convoluted tube, 1150mm long

- **TC1279-480A**
  75mm OD, 60mm ID convoluted tube, 1150mm long (with 2 x 75mm long by 88mm dia. adaptor tube)

- **TC1279-494KIT**
  Convoluted Tube adaptor kit - 88mm OD to 50mm OD
Low Profile Ducting Solution - 220mm X 50mm (8” X 2”)

The low profile duct solution can be used as a bridging adaptor and interconnection between two parallel lengths of duct where ceiling height constraints are an issue.

### Straight Duct Lengths

Low profile straight duct lengths require the use of Slotted Joiners which are simple to install.

**220mm x 50mm (8” x 2”) - 2 metre lengths**
- TC1279-392 Solid Duct only
- TC1279-392ASN Solid Duct with Snap on Cover

### Joiner

The joiner is used to connect low height, 220 x 50mm straight ducting to a Top Outlet Assembly, Horizontal Outlet, with which it provides a smooth & strong joint.

**Part No - TC1279-482**

### Outlet

**Part No - TC1279-461A**

### Low Profile Duct System Joining Kit

Provides a horizontal exit for optical fiber cords, anywhere along a straight 100mm, 220mm or 300mm duct run. The unit simply fits along the edge of the duct – ie, the side of the duct is not specially prepared or cut. The outlet curve has no ribs so there is nothing to restrict the naturally occurring free flow of optical fiber cords. By altering the length of the connecting 220 x 50mm duct, different offset spacings for duct systems can be made. Easily installed without having to cut or prepare the side of the duct.

**Part No. TC1279-461KIT**

Kit includes the following:
- 2 x TC1279-461A Over the top outlets
- 2 x TC1279-482 Joiners
- 1 x .66 Metre length of low profile 220mm Duct with cover

*Interconnection between 2 parallel duct lengths where there are ceiling height constraints*
Metal Mounting Hardware

WBT mounting hardware is used to support the ducting~raceway from different structures. Although the most common components are shown here, many other components that have been developed for specific applications or customer requests are also available. Mounting Systems are also available for retro-fitting to existing installations. Custom components can also be manufactured to your specifications. Please contact your WBT sales office or distributor for assistance.

Metal Mounting Kits

**Use / Application**

**TC1279-104KIT**
1 x Duct Mounting bracket 100mm
1 x Right Angle bracket
1 x Auxiliary base
4 x Screws
4 x Nuts
9 x Washers
1 x Hex Screw

**TC1279-133KIT**
1 x Duct Mounting bracket 220mm
1 x Right Angle bracket
1 x Auxiliary base
4 x Screws
4 x Nuts
9 x Washers
1 x Hex Screw

**TC1279-161KIT**
1 x Right angle mounting bracket
1 x Straight bracket
4 x Screws
8 x Washers
4 x Nuts
Kit provides extension to 260mm with 100mm duct mounting bracket

**TC1279-183KIT**
1 x Right angle mounting bracket
2 x Nuts
3 x Screws
3 x Washers
Kit provides extension to 360mm with 220mm duct mounting bracket

**TC1279-297AKIT**
1 x Duct Mounting bracket 300mm
2 x Straight bracket
2 x Threaded rod 12mm x 1M
12 x Washers
8 x Locknuts
2 x Bolts
2 x Screws

**TC1279-297BKIT**
Contains 2 X 5/8” threaded rod instead of 12mm

**TC1279-297KIT**
1 x Duct Mounting bracket 300mm
2 x Straight brackets
3 x Nuts
3 x Bolts 1/2”x13mm
5 x washers
(no threaded rod)

Provides Vertical & Horizontal mounting flexibility to steel-work or walls

**Use / Application**

**Duct mounting brackets purchased separately.**
For more information
See page 19

**continued next page...**
Suspension Kits

TC1279-106KITA
1 x Duct Mounting bracket 220mm
1 x Straight bracket
2 x Threaded rod 12mm x 400mm
8 x Nuts
1 x Bolt 12mm x 13mm
9 x Washers
TC1279-106KITB
Contains 2 x 16mm threaded rod instead of 12mm

TC1279-107KITA
1 x Duct Mounting bracket 100mm
1 x Straight bracket
2 x Threaded rod 12mm x 400mm
8 x Nuts
1 x Bolt 12mm x 13mm
9 x Washers
TC1279-107KITB
Contains 2 x 16mm threaded rod instead of 12mm

Raised Mounting Kits

TC1279-106KIT
1 x Mounting Plate 30 - 50mm
1x 2 part Hook & Loop adhesive
1 x Treaded rod 12mm x 400mm
4 x Nuts
4 x Washers

TC1279-129KIT
This Mounting Kit is used for supporting 30 & 50 mm duct above or below cabinets or iron work.

TC1279-129KIT
1 x Mounting Plate 30 - 50mm
1x 2 part Hook & Loop adhesive
1 x Treaded rod 12mm x 400mm
4 x Nuts
4 x Washers

TC1279-13A
1 x Duct mounting bracket 220mm
1 x Threaded rod 12mm x 400mm
3 x Nuts
3 x Washers
1 x Protective tube

TC1279-14A
This Mounting Kit is used for supporting 100mm duct above or below cabinets or iron work.

TC1279-297BKITA
1 x Duct mounting bracket 300mm
2 x Straight bracket
2 x Threaded rod 5/8" UNC x 300mm
8 x Nuts 5/8"
2 x Nuts 1/2"
2 x Bolts 1/2" x 13mm
12 x Washers

TC1279-297BKITA
This Mounting Kit is used for supporting 300 mm duct above or below cabinets or iron work.
Underfloor Mounting Kits

**TC1279-197KIT**
1 x Bracket
1 x U-Bolt
2 x Nuts
1 x Flat bar washer

**TC1279-155KIT**
1 x Bracket
1 x Clamp Bracket
2 x Washers, Nuts & Bolts
Used with 100, 220, 300mm Duct mounting kits.

**TC1279-154KIT**
Used with 30 & 50mm Duct mounting kits.

**TC1279-171**
1 x Bracket
Used to attach 100, 200 & 300mm duct mounting kits from any 2” section

**TC1279-59**
1 X Bracket
Used to attach 100, 200 & 300mm duct mounting kits from any 40mm section

Ladder Rack and Unistrut Mounting Kits

**TC1279-152KIT**
Dual duct mounting bracket for 100mm & 220mm ducting

**TC1279-303A**
1 x Side mount bracket
1 x Bolt
1 x Washer
Bracket provides side and height adjustment for 300, 220 & 100mm duct mounting brackets.

**TC1279-155KIT**
1 x Bracket
1 x Clamp Bracket
2 x Washers, Nuts & Bolts
Used with 100, 220, 300mm Duct mounting kits.

**TC1279-370KIT**
Large Ladder rack mount Kit. Suitable to be used with 100, 200, 300mm Duct mounting kits.

**TC1279-154KIT**
Used with 30 & 50mm Duct mounting kits.

**TC1279-171**
1 x Bracket
Used to attach 100, 200 & 300mm duct mounting kits from any 2” section

**TC1279-59**
1 X Bracket
Used to attach 100, 200 & 300mm duct mounting kits from any 40mm section

Mounting Hardware

**Duct Mounting Brackets**
30mm TC1279-148A
50mm TC1279-147A
100mm TC1279-16A
220mm TC1279-15A
300mm TC1279-297A

**TC1279-130KIT**
2 X Right angle bracket
1 x Bracket & stud
1 x Hook & Loop adhesive pad
3 x Bolts
4 x Nuts
5 x Washers

**TC1279-78KIT**
1 X Bracket with stud screw
1 x Hook & Loop adhesive pad(2 Parts)
2 x Bolts
3 x Nuts
3 x Washers

**TC1279-274**
1 x Bracket only
Used to support duct mounting kits from concrete floor in raised floor applications. Can be simply glued or bolted to the floor.
**Miscellaneous Items & Tooling**

**Useful Miscellaneous Items**

- **TC1279-156: UNIVERSAL RADIUS GUIDE:**
  This guide is a simple means of providing a 30-mm radius guide that eliminates fiber stress through bending.

- **TC1279-55KIT:**
  50 X 50mm X 2m

- **TC1279-58KIT:**
  25 X 30mm X 2m

- **GREY PVC SLOTTED DUCT:**
  This slotted duct is used for dropping off optical fibers from the overhead ducting system to racks & equipment sub-racks/panels.

  - **TC1279-55KIT:**
    50 X 50mm X 2m
  - **TC1279-58KIT:**
    25 X 30mm X 2m
  - **TC1279-99KIT:**
    60 X 40mm X 2m
    (not slotted)

- **TC1279-72KIT:**
  PIGTAIL RADIUS GUIDE KIT
  The pigtail radius guide provides a 90 degree bend, but the guides are interlocking so that many can be joined to form U turns, circles & spirals - as required. (10 per kit)

- **TC1279-294:**
  RAMP OFF FOR 300, 200, 100mm DUCT
  Provides a safe bending radius for the fibers being dropped off or leaving: 300mm, 220mm or 100mm duct. It does this simply by providing a curved ramp up which fiber is able to form a 30mm radius.

- **TC1279-156:**
  UNIVERSAL RADIUS GUIDE
  This guide is a simple means of providing a 30-mm radius guide that eliminates fiber stress through bending.

**Tooling**

Tool Kits and individual tools are available for cutting, slotting and providing cut-outs for drop components.
TC1279-500KIT : Optic Fiber Ducting Slotting Tool - Foot Operated

The foot operated duct slotting tool allows installers to improve efficiency with its no-fuss operation and ergonomic design. Take advantage of this new method to safely and easily slot ducting, which will improve the efficiency of your installations and save you and your customer time and money.

**Slots the following Duct Sizes**

<table>
<thead>
<tr>
<th>Duct Size Millimeters</th>
<th>Duct Size Inches</th>
<th>Duct Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>100mm x 50mm</td>
<td>4” x 2”</td>
<td>TC1279-223</td>
</tr>
<tr>
<td>100mm x 100mm</td>
<td>4” x 4”</td>
<td>TC1279-23</td>
</tr>
<tr>
<td>220mm x 100mm</td>
<td>8” x 4”</td>
<td>TC1279-21</td>
</tr>
<tr>
<td>300mm x 100mm</td>
<td>12” x 4”</td>
<td>TC1279-275</td>
</tr>
</tbody>
</table>

**Features & Benefits**
- Ducting can be easily aligned and positioned on slotting jig
- Fast and easy to use slotting mechanism which slots in seconds
- Compact, easy to transport unit which only weighs 8kg
- Steady and robust platform
- Ergonomically designed, no stress or heavy manual operation required as it only requires leg power
- Conforms to OH&S standards
- Repeatedly produces accurate slots

TC1279-501KIT : Optic Fiber Ducting Hydraulic Hand Held Slotting Tool

The hand held hydraulic duct slotting tool is a revolutionary design that takes the stress and effort out of slotting duct. Take advantage of this new method of safely and easily slotting ducting, which will improve the efficiency of your installations and save you and your customer time and money.

**Slots the following Duct Sizes**

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<tr>
<th>Duct Size Millimeters</th>
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<td>300mm x 100mm</td>
<td>12” x 4”</td>
<td>TC1279-275</td>
</tr>
</tbody>
</table>

**Features & Benefits**
- No need to exert excessive force since the unit is hydraulic powered
- Safe & easy to use
- Ergonomically designed
- Compact design which is easy to transport and doesn’t require excess storage space.
- Saves you time by slotting duct quickly
- Allows you to slot an end of duct in less than 1 minute
- Lightweight, only 2kg
- Repeatedly produces accurate slots
- Slots a variety of duct sizes from 100mm x 50mm up to 300mm x 100mm

**Other Available Parts**
- TC1279-501 100mm Hand Hydraulic Tool
- TC1279-501-13S 100mm Hand Hydraulic Tool Head
- TC1279-501KIT 100mm Hand Hydraulic Tool Kit with tool box
- TC1279-502 50mm Hand Hydraulic Tool
- TC1279-502-13S 50mm Hand Hydraulic Tool Head
- TC1279-501KIT 50mm Hand Hydraulic Tool Kit with tool box
- TC1279-504KIT 100-50mm Hand Hydraulic Tool Kit with tool box
Slotting tools are used to produce slots in the end of a cut length of duct required by the snap together of joiners.

Cut out tools are used to cut notches in the side of the duct to accommodate drop-outs. They are supplied with a fiber spreader to protect previously installed fibers when using the tools.

Mitre boxes are used to provide a means of producing an accurate and straight cut on ducting, essential for correct alignment of the slotting tools and joiners.

<table>
<thead>
<tr>
<th>TC1279-119KIT</th>
<th>TC1279-118KIT</th>
<th>TC1279-51KIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>30/50mm mitre box</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>100/220/300mm mitre box</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Panel saw</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Tool box</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>30mm slot tool</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>50mm slot tool</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>100/220mm slot tool</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Fiber spreader</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

TC1279-140KIT
30/50mm cut & slot kit
TC1279-50KIT
100/220mm cut & slot kit
TC1279-TKIT
Combination Kit
TC1279-231KIT
30, 50, 100, 220 & 300mm cut out tool kit

<table>
<thead>
<tr>
<th>TC1279-140KIT</th>
<th>TC1279-50KIT</th>
<th>TC1279-TKIT</th>
<th>TC1279-231KIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>30/50mm mitre box</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>100/220/300mm mitre box</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>30mm slot tool</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>50mm slot tool</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>100/220mm slot tool</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>100x50mm side slot tool</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Cut-out tool</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Large cut-out tool - 100mm drop</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Wrench</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Large Wrench - 375mm handle</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Fiber spreader</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>
Other Warren & Brown Products & Services

Warren & Brown can also provide duct layouts, planning and installations and we are happy to provide a free quotation.

Warren & Brown Technologies also specialise in:
- Telecom Exchanges
- Data Centers
- FTTH Products & Solutions

In addition to our lightpaths ducting raceway system, Warren & Brown also provide many other Fiber Management products and solutions. If you have a fiber management problem, we have a solution...

High Density Optical Frames & Optical Suite Frames

Splice / Patch Fiber Management Trays

Optical Fiber Cable Assemblies

Features and Benefits

Warren & Brown can custom make your optical fiber patchcords or pigtails to your specific requirements.

Available in the following variations:

- Any connector type - FC, LC, SC, SC/A, ST, DIN, LC/A etc.
- Any cord length from 0.5 metres upwards
- Any cord size - 900um, 2mm, 2.4mm, 3mm
- Any range of fibers - Single fiber, Duplex, 4F, 6F, 8F, 12F, 16F, 24, 36, 48F, etc.
- Singlemode G657B fiber (MBR 15-20mm)
- Single cord safe working load is 100N
- Indoor or Outdoor cable
- Fast production time
Warren & Brown Technologies are also at the forefront in developing FTTH (Fiber to the Home) products & solutions. Our experienced engineering and sales teams can assist in tailoring the ideal solution for you. WBT also supply wall boxes, Closures, couplers, splitters, thru adaptors, cable assemblies, etc., as well as many other components suitable for FTTH applications.

### Wall Boxes

![Indoor & Outdoor Wallboxes](image)

### Passive Fiber Connectivity - Couplers, Attenuators, Splitters, etc

![Passive Fiber Connectivity](image)

### Datacentre Solutions

WBT also have a range of Data Centre Products and solutions including MPO Cassette’s, subsracks and patchcords. Please contact the WBT sales team for further information.
<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>APC</td>
<td>Angled physical contact connector with an 8 degree end angle on ferrule. Has high value of RL</td>
</tr>
<tr>
<td>Attenuation</td>
<td>The loss in dB of a splice or in dB/km of an optical fiber cable</td>
</tr>
<tr>
<td>Attenuator</td>
<td>An item inserted in-line, to reduce the strength of optical signal</td>
</tr>
<tr>
<td>Bare Fiber Adapter</td>
<td>Used to connect an instrument, with a low IL, to a fiber for testing</td>
</tr>
<tr>
<td>Bending loss</td>
<td>Loss of optical fiber signal strength at bends smaller than the MBR</td>
</tr>
<tr>
<td>BER</td>
<td>Bit error rate. A measure of acceptable optical signal transmission, eg. 1 x 10 –9 minimum</td>
</tr>
<tr>
<td>Buffered fiber</td>
<td>A 900 micron fiber, usually in an internal cable</td>
</tr>
<tr>
<td>BPON &amp; GPON</td>
<td>Advanced PON’s</td>
</tr>
<tr>
<td>Core</td>
<td>A 9 micron dia central part of a single mode fiber, that carries the optical signal, or 50 micron for a multi-mode fibre</td>
</tr>
<tr>
<td>Cladding</td>
<td>The 125 micron dia outer part of an optical fiber, that assists in carrying the optical signal</td>
</tr>
<tr>
<td>Cleaving</td>
<td>The accurate end preparation of a fiber, prior to fusion splicing</td>
</tr>
<tr>
<td>Connector</td>
<td>A precision mechanical device, that connects fibers together at a patch panel; eg FC, ST, ST, LC, etc</td>
</tr>
<tr>
<td>Coupler</td>
<td>A precision, passive, optical device to join or split light signals along an optical fiber route</td>
</tr>
<tr>
<td>Cord</td>
<td>A tight buffered 900 micron fiber item, with strength member and protective sheath, used to make pigtailed and patchcords</td>
</tr>
<tr>
<td>dB</td>
<td>A decibel is a measure of losses or attenuation of optical fiber components</td>
</tr>
<tr>
<td>Detector</td>
<td>Converts optical signal to electrical signal</td>
</tr>
<tr>
<td>Dispersion</td>
<td>A measure causing signal degradation in multi-mode fiber, that limits bandwidth and transmission distance</td>
</tr>
<tr>
<td>Dispersion shifted fiber</td>
<td>A single mode fiber, that has zero dispersion at the signal wavelength, eg 1550nm</td>
</tr>
<tr>
<td>Ducting system</td>
<td>A system of items for feeding cords in a CO or Exchange, whilst maintaining the MBR under all/every condition</td>
</tr>
<tr>
<td>Downstream transmission</td>
<td>Transmission from a CO or Exchange to many Customers simultaneously, eg 32 on a single fiber in a PON</td>
</tr>
<tr>
<td>Duplex Cord</td>
<td>A patchcord or pigtail with two tight buffered fibers</td>
</tr>
<tr>
<td>FC connector</td>
<td>Screw to lock connector type with a 2.5mm dia zirconia ferrule</td>
</tr>
<tr>
<td>Ferrule</td>
<td>The precision mating part of a connector, usually made of ceramic, zirconia</td>
</tr>
<tr>
<td>Fiber</td>
<td>Transmission media for laser light. Can be single-mode or multi-mode types</td>
</tr>
<tr>
<td>FR</td>
<td>Fire retardant property of a duct system</td>
</tr>
<tr>
<td>Fusion Splicing</td>
<td>Joining of two fibers together, using an electric arc in a splicing machine</td>
</tr>
<tr>
<td>GHz</td>
<td>Gigahertz, one billion hertz</td>
</tr>
<tr>
<td>Gigabit</td>
<td>Transmission of one billion bits per second, Gbps</td>
</tr>
<tr>
<td>Hertz (Hz)</td>
<td>A measure of frequency in cycles per second</td>
</tr>
<tr>
<td>Index of refraction</td>
<td>The ratio between speed of light in a vacuum and another media, eg glass</td>
</tr>
<tr>
<td>Index matching material</td>
<td>A special compound sometimes used to improve the optical signal performance at the connection point between two fibres</td>
</tr>
<tr>
<td>Insertion loss</td>
<td>The signal loss in dB at the connection between two connectors</td>
</tr>
<tr>
<td>Jacket (Sheath)</td>
<td>The outer skin of a cord or cable, usually PE or PVC</td>
</tr>
<tr>
<td>Kilometre</td>
<td>1000 metres</td>
</tr>
<tr>
<td>Laser</td>
<td>A transmitter used to generate a narrowband optical fiber signal</td>
</tr>
<tr>
<td>LC connector</td>
<td>Push to lock connector type with a 1.25mm dia zirconia ferrule</td>
</tr>
<tr>
<td>Loose tube</td>
<td>A plastic tube used to house and protect either 6 or 12 fibres in a cable</td>
</tr>
<tr>
<td>LSZH</td>
<td>Low smoke, zero halogen property of a duct system</td>
</tr>
<tr>
<td>MBR</td>
<td>Minimum bending radius of a fiber, eg 30mm</td>
</tr>
<tr>
<td>Mechanical splice</td>
<td>A precision unit that can join two fibers together, and make a low loss connection</td>
</tr>
<tr>
<td>MHz</td>
<td>Megahertz, one million hertz</td>
</tr>
<tr>
<td>Micron</td>
<td>1 x 10 –6 metres (µm) Used as a measure of optical fiber</td>
</tr>
<tr>
<td>Multi-mode</td>
<td>An optical fiber system, with limited range, due to modal losses</td>
</tr>
<tr>
<td>Multiplexing</td>
<td>The combination of two or more signals, onto a single fibre</td>
</tr>
<tr>
<td>Nanometre</td>
<td>1 x 10-9 metres. Used as a measure of wavelengths, eg. 1310nm and 1550nm</td>
</tr>
<tr>
<td>Optical amplifier</td>
<td>A component that can amplify an optical signal on a fiber, to extend the transmission distance</td>
</tr>
<tr>
<td>OTDR</td>
<td>An instrument used to look along an installed fiber route. Used to identify high loss points.</td>
</tr>
<tr>
<td>PC</td>
<td>In commissioning and fault finding</td>
</tr>
<tr>
<td>Patchcord</td>
<td>A cord length with a connector at each end</td>
</tr>
<tr>
<td>Patch panel</td>
<td>A connection point in a fiber circuit. Can be opened for fault finding, testing or service restoration</td>
</tr>
<tr>
<td>Pigtail</td>
<td>A cord length with a connector at one end</td>
</tr>
<tr>
<td>PON</td>
<td>Passive optical network, with splitters. A single fiber can feed typically 32 customers from a CO or Exchange, using two way transmission, ie. upstream and downstream simultaneously</td>
</tr>
<tr>
<td>Reflection</td>
<td>The reflected return of part of the incoming light beam at a connectors end face</td>
</tr>
<tr>
<td>Refraction</td>
<td>The deflection of a light beam in the core/cladding part of a fiber</td>
</tr>
<tr>
<td>Return Loss</td>
<td>A measure in dB of the reflected part of a light signal. RL for UPC polish is –40 dB; and for APC polish –55 dB</td>
</tr>
<tr>
<td>SC connector</td>
<td>Push to lock connector type with a 2.5mm dia zirconia ferrule</td>
</tr>
<tr>
<td>Simplex cord</td>
<td>A cord with one tight buffered fiber</td>
</tr>
<tr>
<td>Singlemode</td>
<td>A fiber that supports one mode (or wavelength) of transmission, with no modal loses. Achieves high capacity, long transmission range</td>
</tr>
<tr>
<td>Splicing</td>
<td>See fusion splicing</td>
</tr>
<tr>
<td>Splitter</td>
<td>A passive optical device that splits up a single optical signal into several, eg 2, 16, 32, etc</td>
</tr>
<tr>
<td>Through Adaptor</td>
<td>Used to join two connectors together at a patch panel</td>
</tr>
<tr>
<td>UPC</td>
<td>Ultra physical contact. A high standard polish finish for connector ferrules</td>
</tr>
<tr>
<td>Upstream transmission</td>
<td>Transmission from a Customer to a CO or Exchange</td>
</tr>
<tr>
<td>Waterpeak loss</td>
<td>Part of the spectral attenuation verses wavelength curve, where a high loss occurs. If removed, fiber performance improves, eg. ITU spec G652D, with no water peak</td>
</tr>
<tr>
<td>Wavelength</td>
<td>Optical fibre wavelengths sent over an optical fiber eg 850nm, 1310nm, 1550nm</td>
</tr>
<tr>
<td>WDM</td>
<td>Wave length division multiplexing. Transmitting many optical signals down a single fiber simultaneously, eg 16 or 48, etc</td>
</tr>
<tr>
<td>WWDM</td>
<td>Wide (band) WDM</td>
</tr>
</tbody>
</table>
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