

# Leviton Fiber Raceway System Application Guide

## Modular Bend Radius Compliant Pathway Solution

### Introduction

The Leviton Fiber Raceway System (FRS) provides a robust solution to route, protect, and store fiber cabling in data centers, head ends, telecom rooms, and wiring closets.

The system is comprised of solid or slotted duct sections, horizontal and vertical elbows, tees, and cross sections all of which are connected via simple joiners. Side drop-offs and trumpets along with optional tubing kits provide a transition to vertical management or rack infrastructure. FRS components are available with or without covers.

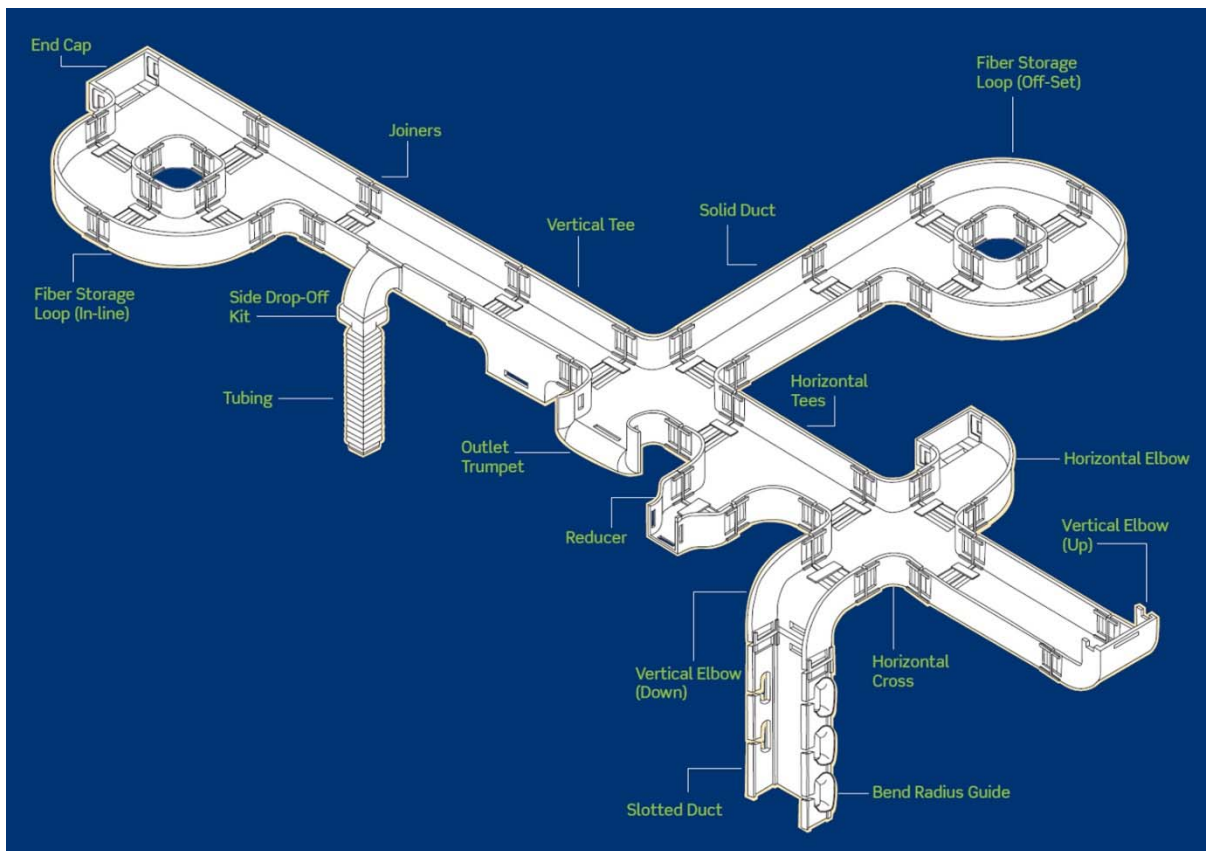
Duct mounting kits provide flexible options to mount the Fiber Raceway System to the building structure. Mounting kits are available to support common mounting scenarios including wall-mount, under-floor, above rack, ladder-rack, Unistrut, and ceiling suspension applications.

Application Note ID:  
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Product Line:  
Fiber Raceway

Part Numbers Affected:  
[Fiber Raceway System](#)



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## Planning & Design Considerations

A detailed floor plan is necessary to create a successful Fiber Raceway design. Begin with a floor plan that includes cabinet and rack placement, ceiling height, and any HVAC or other pathway restrictions.

Consider the size and volume of fiber or copper cables to be routed within the system. Refer to the capacity charts (below) or perform fill-rate calculations to ensure the necessary capacity is available. Select duct sizes that meet the required capacity considering the need for future growth which will ensure the planned pathway is sufficient for current and future demand.

Identify transition and drop-off requirements taking into account the volume of cabling that needs to be supported at each transition point. Transition points and drop-offs can be added later if requirements change, but it is best to plan a minimum of one drop-off for each rack or cabinet initially.

Identify mounting requirements and select the type and size of mounting kits required. Mounting kits should be placed no more than 3 feet (0.9 meters) apart when supporting fiber. For Copper cabling plan a maximum of 2 feet (0.6 meters) between supports. For high fiber volumes or armored cabling reduce the distance between supports to 2 feet (0.6 meters).

Plan the intended system layout first to determine an accurate measure of the length of ducting needed. Then calculate the number of duct sections (to meet the length requirement), joiners, mounting kits, transitions, and drop-offs required. Leviton recommends including 5-10 percent additional duct sections and joiners to account for scrap produced when sections are cut to size and to account for any inconsistencies between the site and the plan documents.

Demand for Fiber Raceway components is project based and as such components are not typically stocked in large quantities, but instead manufactured to meet demand. Ensure orders are placed early to allow 6-8 weeks for delivery of materials from our US Distribution Facilities (contact your Leviton Representative for urgent requirements).

### Ducting and Components Capacity

Duct Size - inches		2 x 2			4 x 4			4 x 8			4 x 12		
Duct Size - mm		50 x 50			100 x 100			220 x 100			300 x 100		
Cable Size - mm		3	2-2.4	1.6-2	3	2-2.4	1.6-2	3	2-2.4	1.6-2	3	2-2.4	1.6-2
Capacity	Ducting	120	155	265	500	700	1200	1100	1500	2500	1500	2100	3600
	Ducting with Ramp-Off/Drop-Off	—	—	—	300	400	700	720	1000	1700	1120	1600	2800
	Vertical Tee - Horizontal Channel	120	155	265	500	700	1200	500	700	1200	1500	2100	3600
	Vertical Tee - Vertical/Drop-Off Channel	—	—	—	500	700	1200	500	700	1200	1100	1500	2500

### Convuluted Tubing Capacity

Tubing Size	1.5 in. round, split			2 in. square		
Optical Cable Size	3	2-2.4	1.6-2	3	2-2.4	1.6-2
Capacity	24	30	50	120	155	265

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## Fiber Raceway System (FRS) – Duct Sections and Joiners

Leviton FRS components are designed to join together quickly and securely.

The System includes two types of ducting: **slotted and solid**.

**Slotted** ducting has pre-cut slots on each end allowing each section to be snapped together with another section or slotted component using slotted joiners. When cut, this duct type requires the use of a Slotting Tool to add end slots. This style of duct also has openings spaced along the duct for optional bend-radius guides.

**Solid** ducting has no pre-cut slots or openings and uses slotless joiners which employ a clamping mechanism to securely join components. A standard (flat-blade) screwdriver is used to engage the clamping mechanism.

**Joiners**, slotted or slotless, are needed between each duct system component. Slotless joiners are compatible with both duct types.

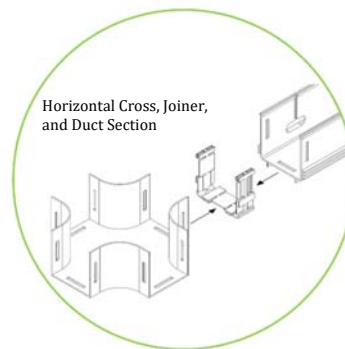
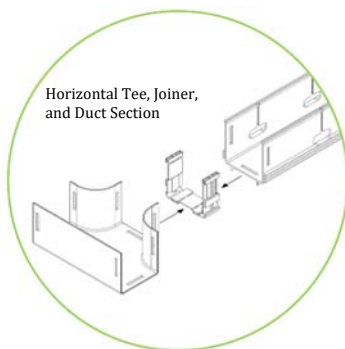
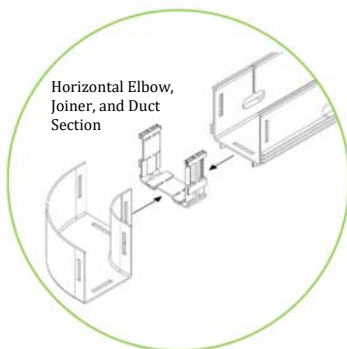
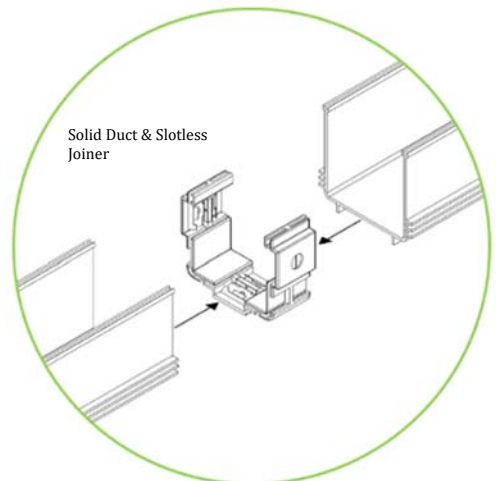
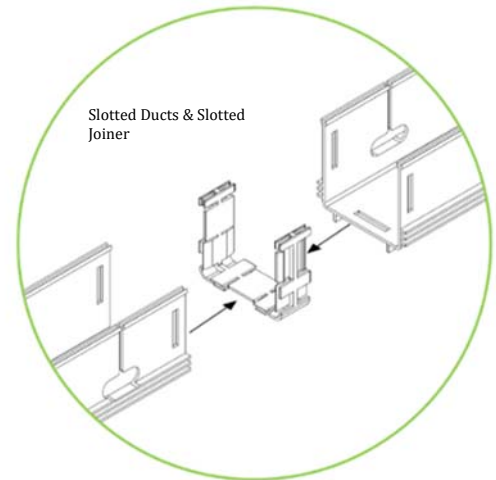
### Elbows, Tees, Crosses, and Reducers

In addition to straight duct sections, a variety of horizontal and vertical transition components are available. Transitions provide flexibility in design allowing the FRS to be designed around any structural impediments while supporting any Rack or Cabinet layout.

**Horizontal elbows** add 30, 45, or 90-degree horizontal bends to the pathway layout without changing ducting elevation.

**Horizontal tees** provide a three-way intersection point allowing cabling to route to multiple locations.

**Horizontal crosses** provide a four-way intersection point.



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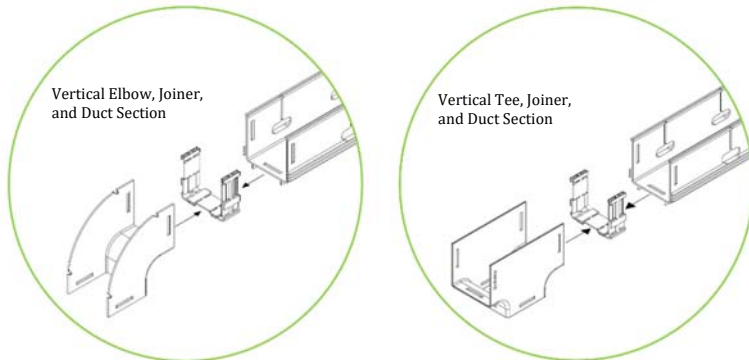
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**Vertical elbows** provide 30, 45, or 90-degree bends along the vertical axis providing a method to transition to duct sections mounted at different elevations or to implement large-volume cable drop-offs.

**Vertical tees** provide a method to continue the horizontal section while allowing a large volume of cable to drop off vertically to duct sections mounted at different elevations or to rack or cabinet infrastructure.

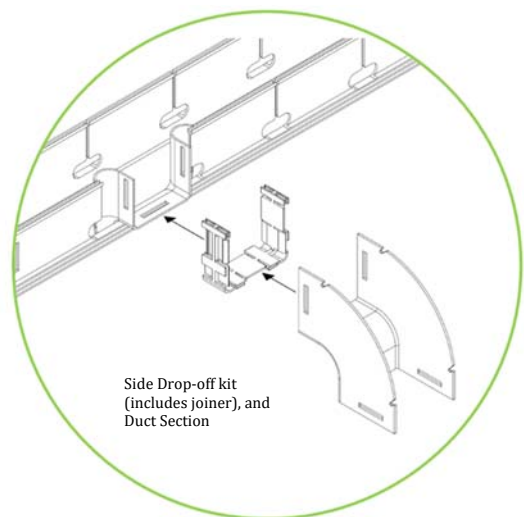


**Reducers** (not pictured) provide a means to transition duct size from larger to smaller. As cabling is routed to its destination the capacity requirements may reduce and a smaller duct size may be better suited to accommodate the required volume of cable.

## Drop-offs, Tubing, Bend Radius Guides, & End Caps

Drop-offs, tubing, and bend radius guides are available to provide easy handoff of cabling from the FRS to Racks or Cabinets. These smaller volume transitions can be added anywhere within the system where needed. End caps close off duct section ends but may be provisioned with knockouts for small-volume exits from the FRS.

**Side Drop-off Kits** provide the ability to add horizontal to vertical transitions at any point along a duct section. Drop-offs are available in cut-in or ramp-over styles in 2x2 and 4x4 duct outlet sizes. Tubing drop-offs are also available supporting round or square convoluted tubing for flexible transitions.



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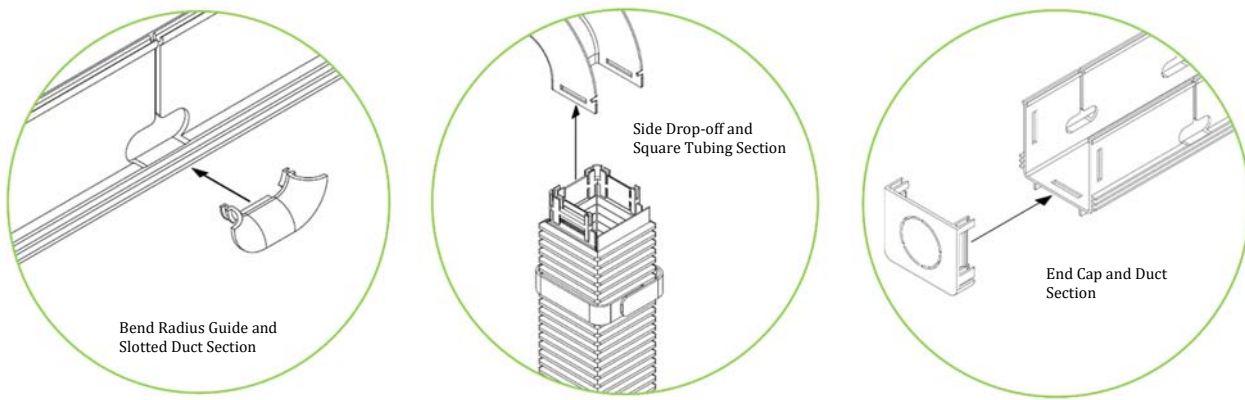
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**Bend Radius Guides** snap into slotted duct slot openings and provide bend-radius compliant exits for patch-cords and small OD cables.

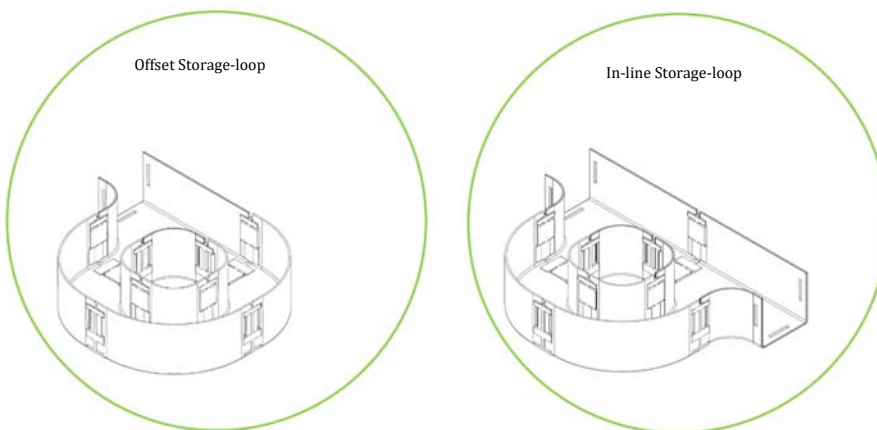
**Tubing Sections** provide flexible transitions from the raceway systems to the building structure and are available in square or round configurations.

**End Caps** are available to finish pathways and can be solid or provided with knockouts to allow transition into or out of the raceway system.



## Fiber storage loops

Storage-loop sections are available in inline and offset configurations to provide storage capacity for excess patch-cord length. Inline storage sections are installed as a connector between two duct sections. Offset storage sections serve as an end point for a duct section with fiber exiting the section in the direction it entered.



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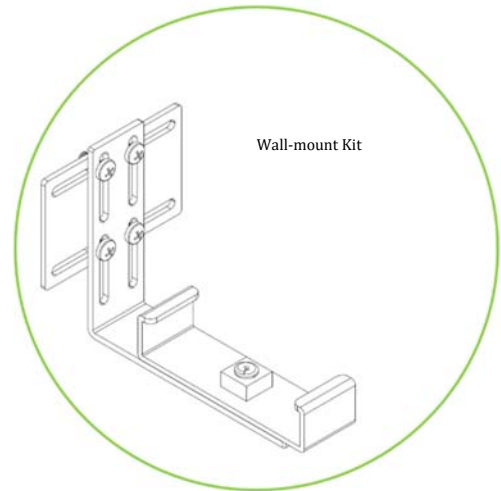
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## Mounting Solutions

Leviton offers flexible solutions to support mounting FRS components to walls, ceiling structure, ladder-rack, Unistrut, under floor and above cabinet applications. Support requires two components: the support bracket(s) and the Duct-mounting bracket. **Verify kit contents when ordering, not all kits include the duct mounting bracket.**

### Wall Mounting Kits

Kits include the wall mounting bracket(s) and duct mounting bracket. Attachment of the bracket to building structure is accomplished using installer provided hardware.

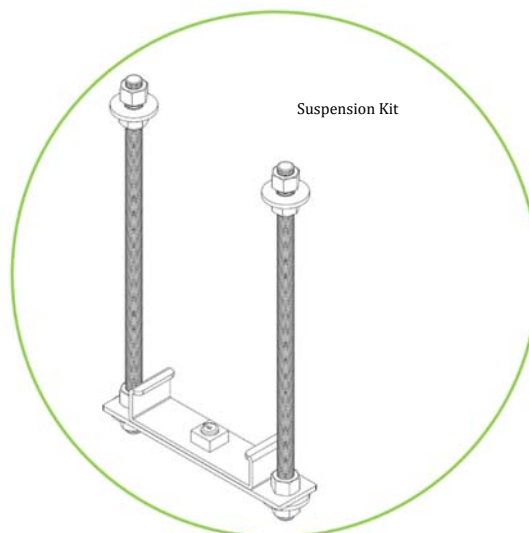
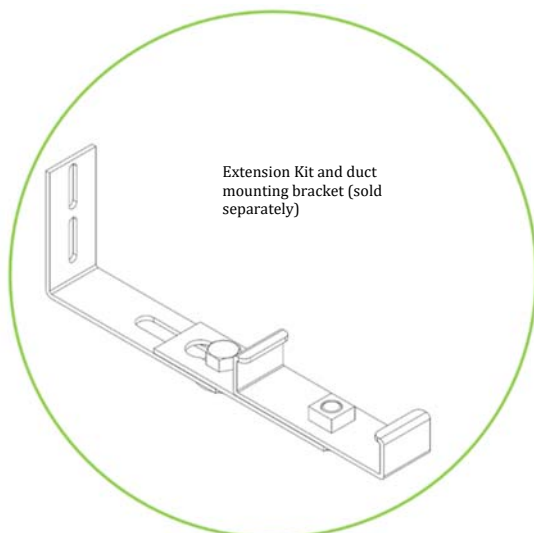


### Extension Kits

These wall-mount brackets provide adjustability and are compatible with the designated duct mounting brackets. Attachment of the bracket to building structure is accomplished using installer provided hardware. **Duct mounting bracket not included.**

### Suspension Kits

Provide a means to support raceway sections from overhead structure. Kits may be provided with or without a 3.3' (1 meter) threaded rod (see product specifications). Attachment to structure is accomplished using installer provided hardware.



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### Raised and Underfloor Mounting Kits

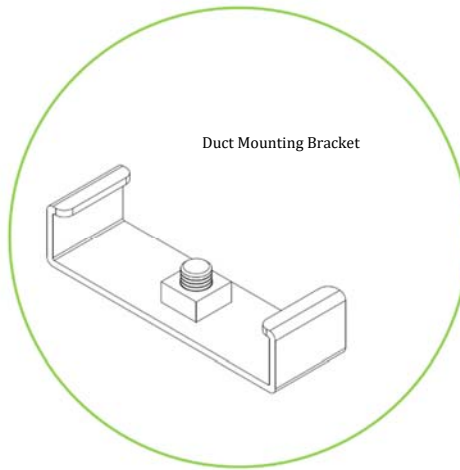
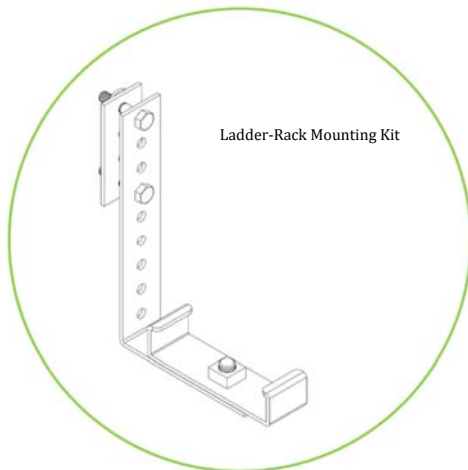
Provide attachment points for under-floor or above cabinet applications. May include a duct mounting bracket and threaded rod (see product specifications). Attachment to cabinet or concrete floor is accomplished using installer-provided hardware. Note, for raised floor applications a stanchion mounting kit or concrete anchoring kit are available.

### Ladder-Rack Mounting Kits

Provide attachment points to existing Ladder-Rack pathway.

### Duct Mounting Brackets

Provides the attachment point between ducting and the selected mounting kit (if not included the specific kit).



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## Tools and Installation Aids

A variety of tools are available to assist with the installation.

### Slotting Tools

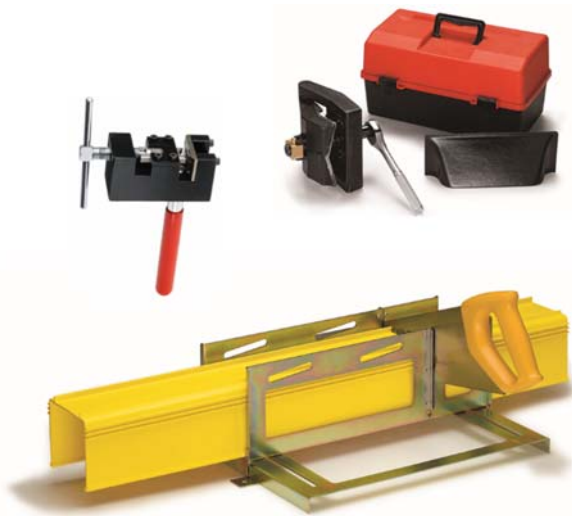
Provide a simple means to add end slots to solid or cut ducting allowing compatibility with slotted joiners. These are available for 2x2 or 4x4 and 4x8 duct sizes. Video Link: [Slotting Tool Operation](#)

### Miter Boxes

Provide a platform and guide for cutting duct sections cleanly.

### Side Cut-out Tools

Provide a simple way to cut out 2x4 and 4x4 sections from duct sections supporting side drop-off kits. Video Link: [Side Cut-out Tool Operation](#)



## Leviton Support

When planning or specifying engage with your Leviton Representative and Leviton Technical Services to assist with selecting all necessary materials. Our Technical Services Team of Application and Specification Engineers and our Technical Services Representatives can create an optimized bill of materials using customer floor plans and answer any design or application related questions. Additional information is also available online at [www.leviton.com/FRS](http://www.leviton.com/FRS)

## System Operation and Maintenance

The Leviton Fiber Raceway System shall be included in the owning organization's site inspections, Leviton recommends inspecting annually to ensure building structure and supports remain intact and secure. At this time ensure all duct sections remain undamaged, with covers installed (as applicable), spill-outs and drop-offs remain secured to ducting and are providing appropriate bend radius support to installed cabling. Any discrepancy shall be immediately resolved.

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