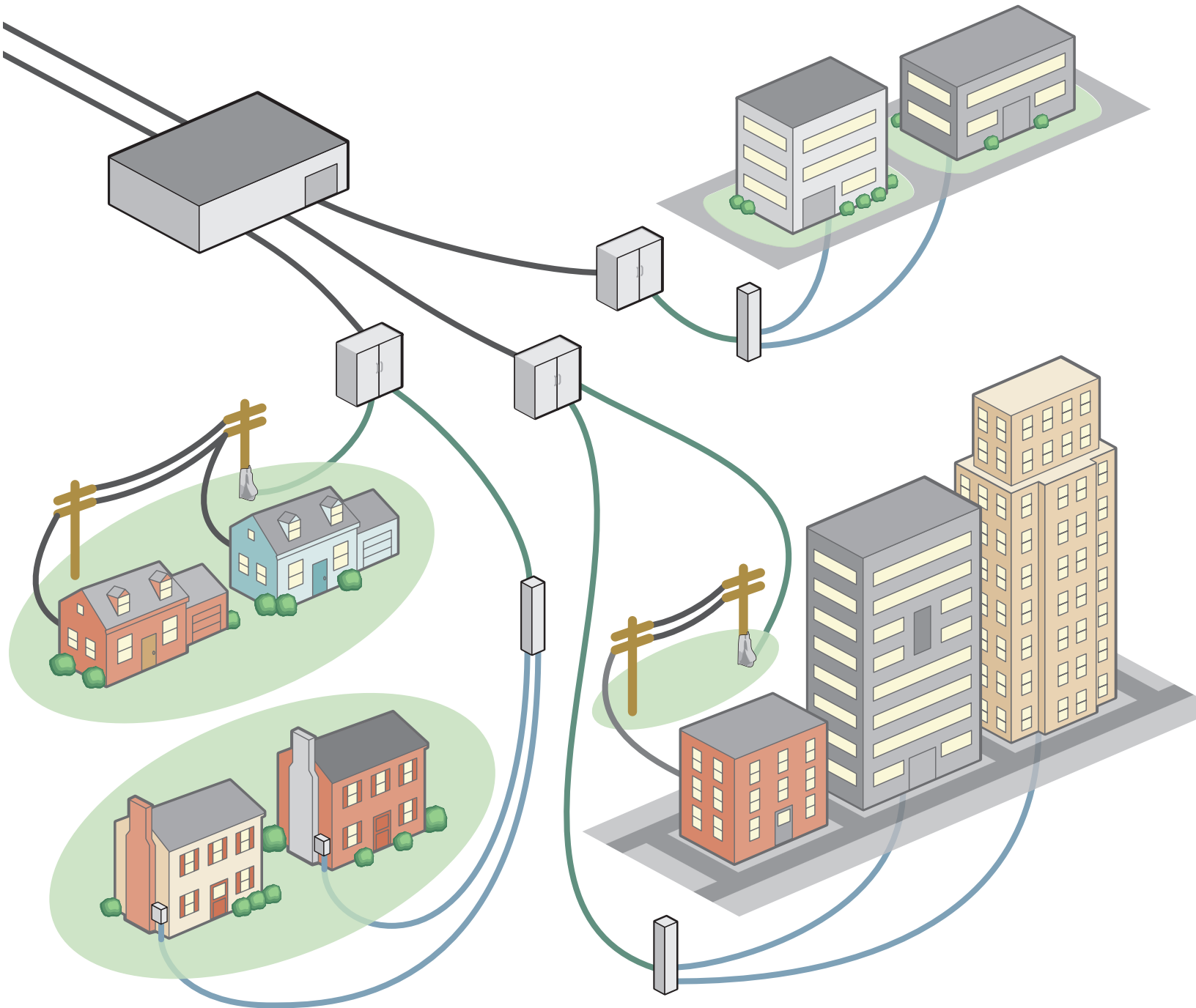


# Carlson® FTTx System Solutions

*Protect. Organize. Identify. Future-Proof.*



*Innovative Solutions For Wire and Cable Management.*

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# Carlson® FTTx System Solutions

## Introduction

Carlson is an industry-leading manufacturer and marketer of nonmetallic premise and outside plant wire and cable management products for the electrical, utility, and telecommunications markets. The company has the world's broadest line of nonmetallic cable management products specifically designed for ease of installation, greater performance and lower installed cost. Carlson also provides technical assistance, field support, and training. And with more than 50 years experience designing, engineering, and manufacturing innovative products for wire and cable management, you know you'll be working with a company you can trust.

## Can you afford not to build or design a conduit system for your FTTx Network?

Fiber/cable is expensive. That's why it's important to protect and organize your investment now and in the future.

### **Protect**

Installing fiber/cable in a conduit system protects against damage, eliminates disruption and ensures the integrity of the system.

### **organize**

Carlson cable management products provide you with a complete conduit system to help efficiently manage the increasing amounts of fiber/cable being installed today.

### **Identify**

Conduit systems help identify network ownership, and identify/segregate various services.

### **Future-Proof**

Carlson conduit systems provide the roadways/path that will allow you to easily upgrade, add or replace fiber/cable in the FTTx network.

# Carlton® Innerduct Guide

## WHERE IS INNERDUCT BEING USED?

### OUTSIDE THE BUILDING

#### Pulled into a Conduit

- HDPE True sized duct recommended 1.00" ID or 1.25" ID
- Corrugated (Riser-Gard and HDPE) duct for newer conduit runs & shorter distance pulls
- HDPE Solidwall for older conduit runs & longer distance pulls

#### Plowed or Trenched

- HDPE SDR sized duct recommended (1 1/4" or larger)
- HDPE SDR 13 wall thickness for non-rocky soil conditions
- HDPE SDR 11 wall thickness for rocky conditions
- Riser-Gard approved for direct bury applications but NOT exposed applications

NOTE:

- Aerial HDPE for exposed applications

### Options

- Color
- Striping
- Factory installed pull lines
- Segmented or paralleled reels
- Pre-lubricated duct

### INSIDE THE BUILDING

#### Plenum

- Must be UL Listed
- Plenum cable must be installed
- Color: Industry standard=orange
- Pull tape pre-installed in sizes 1/2" through 2"
- Plenum-Gard® product numbers:
 

1/2"	CD4X1C
3/4"	CE4X1C
1"	CF4X1C
1 1/4"	CG4X1C
1 1/2"	CH4X1C
2"	CJ4X1C

#### General Purpose & Riser

- Must be UL Listed
- Riser rated cable must be used in riser applications
- Color: Industry standard=orange
- Riser-Gard® product numbers:
 

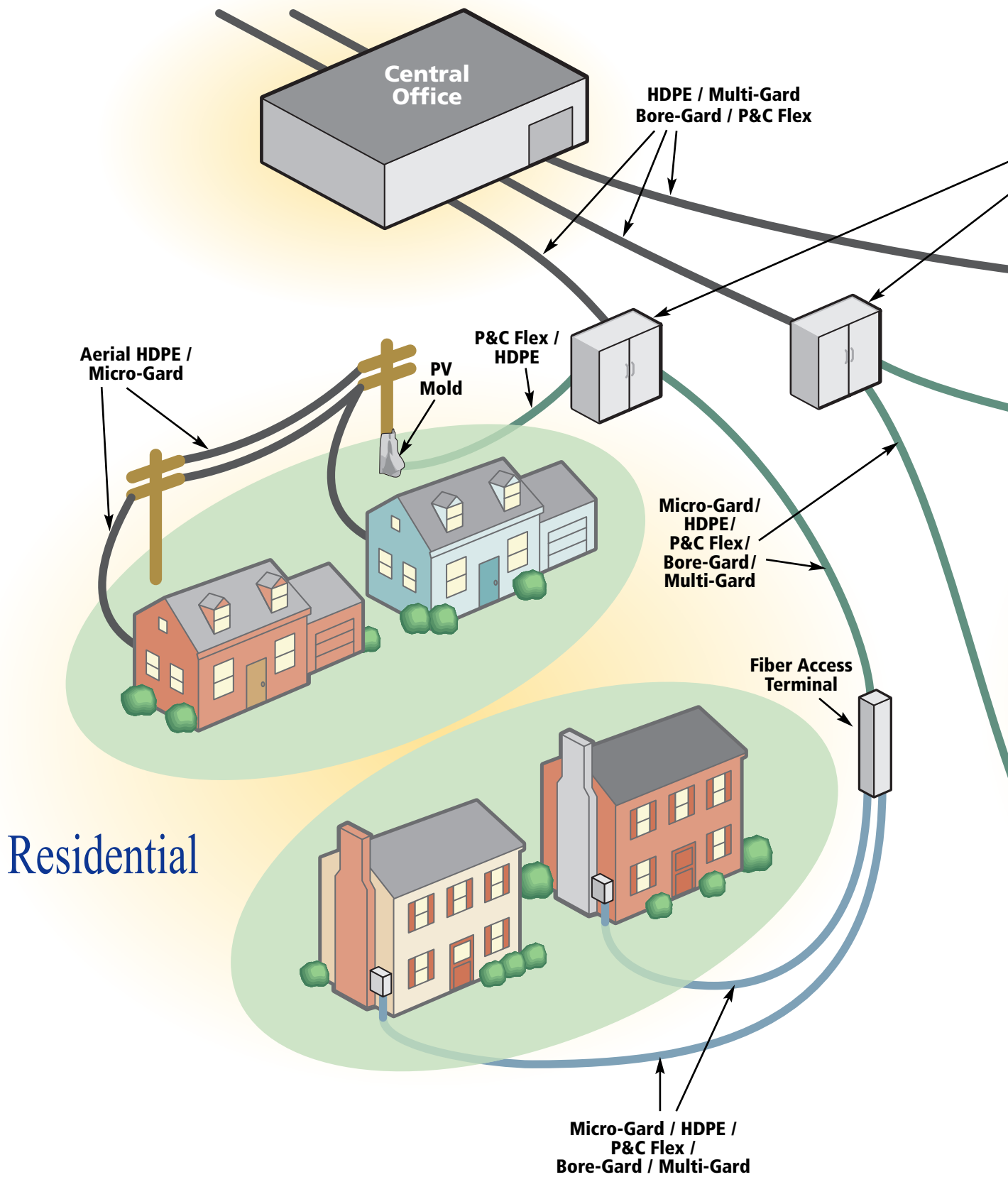
3/4"	DE4X1C
1"	DF4X1C
1 1/4"	DG4X1C
1 1/2"	DH4X1C
2"	DJ4X1C
- Resi-Gard® product numbers:
 

3/4"	SCE4X1
1"	SCF4X1C
1 1/4"	SCG4X1C
1 1/2"	SCH4X1C
2"	SCJ4X1C

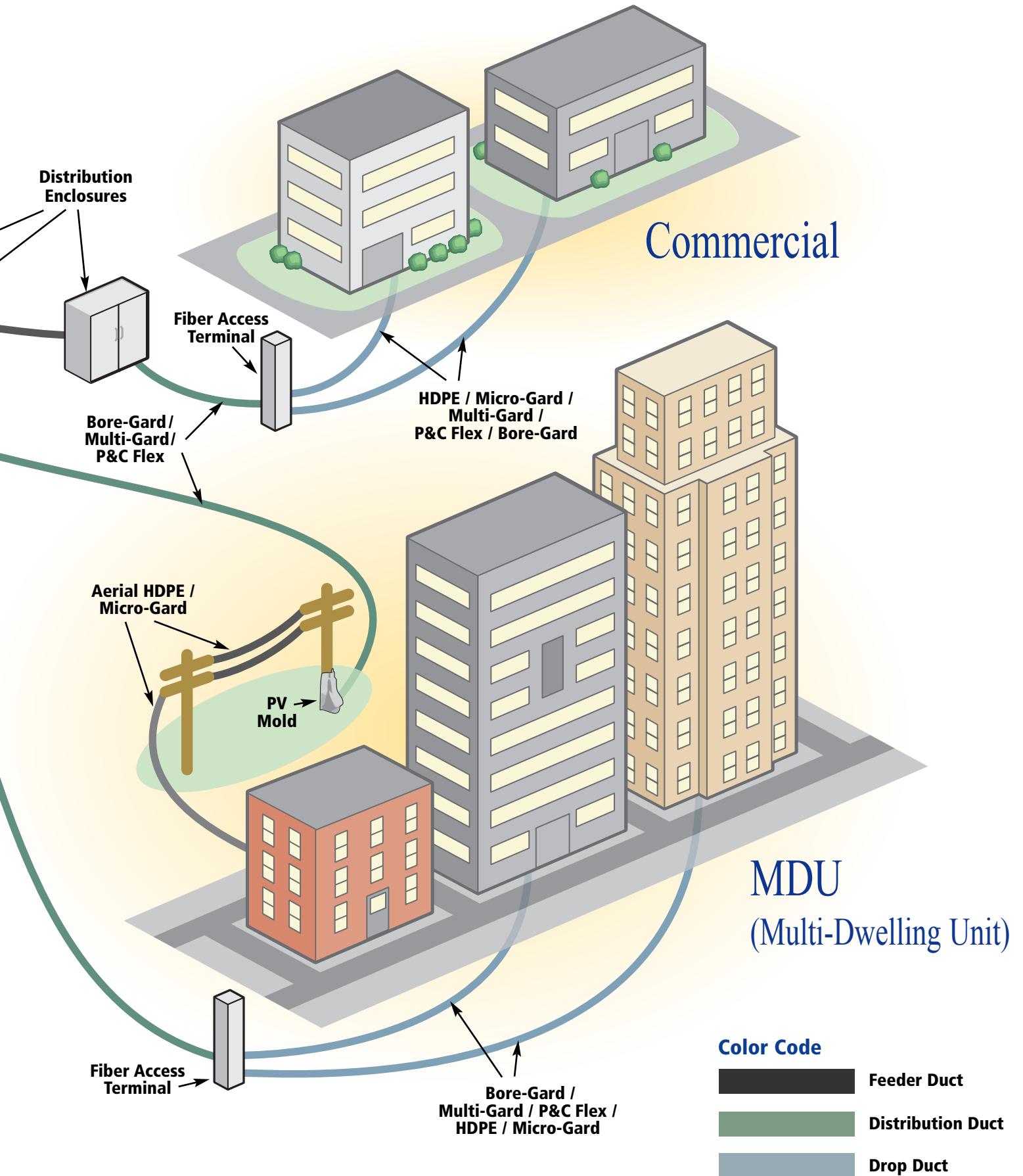
### Note:

- HDPE innerduct will not meet code

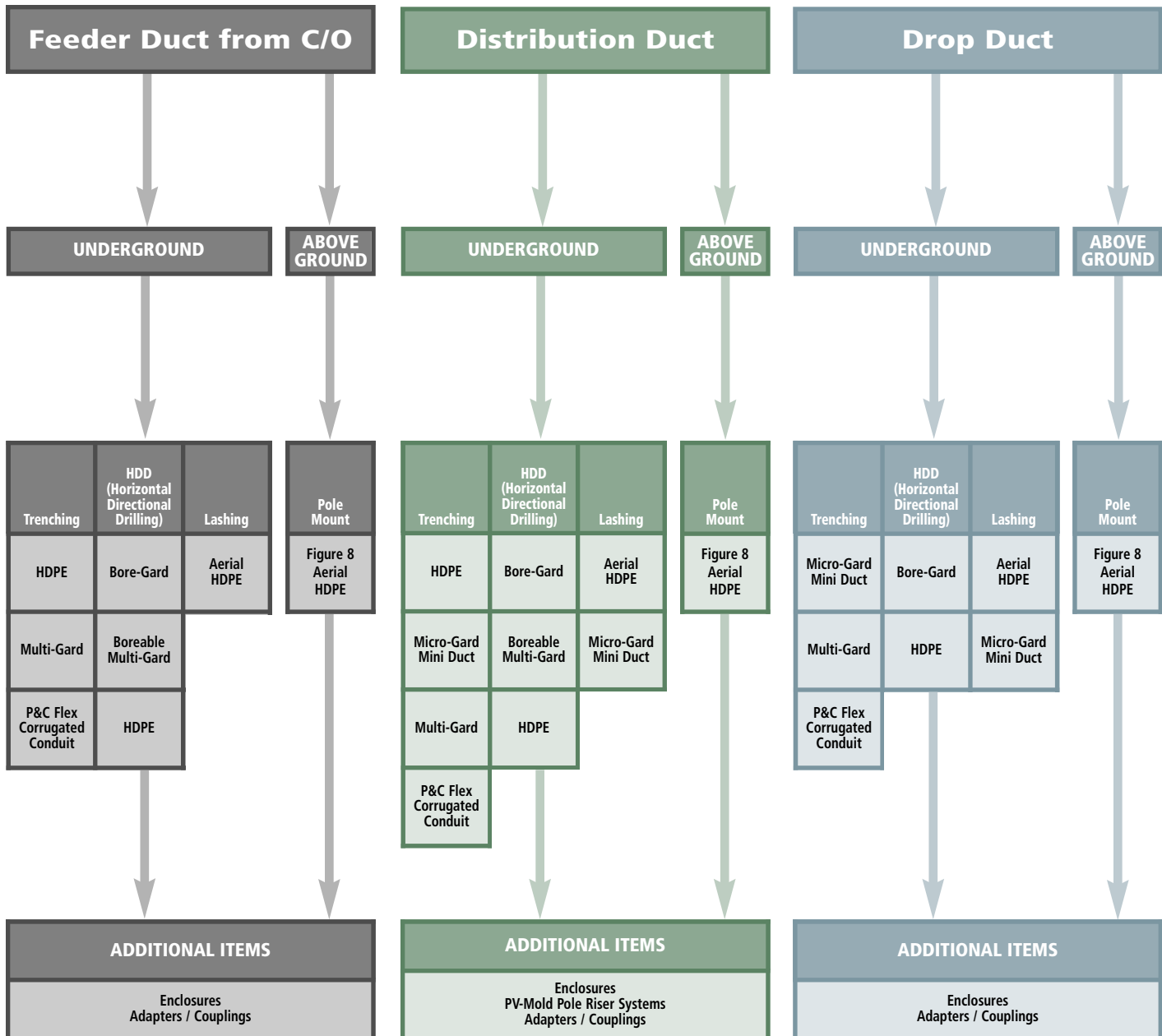
# Carlson® FTTx Outside Plant Solutions







# Product Application/Selection Guidelines



# Outside Plant Conduit

Organizes, protects, identifies and future-proofs wire and cable.

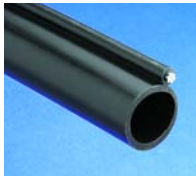
## Aerial HDPE Conduit



Designed to be lashed to existing pole strands.

- UV resistant: minimum 2% carbon black
- Ribbed or smooth interior wall
- Available with pre-installed pull tape
- Sizes: 1", 1-1/4", 1-1/2" and 2"
- Wall types: SDR 11 and SDR 13.5
- Sequentially marked footage
- Material specifications:
  - ASTM 1248 Type III
  - Grade PE34
  - Category 5 Class C

## Aerial Figure 8 HDPE Conduit



Attaches to pole using a 3-bolt mounting clamp.

- UV 3: minimum 2% carbon black
- 6.6 M or 10.0M support strand
- Ribbed or smooth interior wall
- Available with pre-installed pull tape
- Sizes: 1-1/4"
- Wall Type: SIDR 9 True
- Sequentially marked footage
- Material specifications:
  - ASTM 1248 Type III
  - Grade PE34
  - Category 5 Class C
- Span/tensile strength:
  - 6.6M: 225 ft./6,740 lbs.
  - 10.0M: 500 ft./15,400 lbs.

## Bore-Gard® Trenchless Raceway



Designed for horizontal directional drilling applications. Eliminates the need for trenches. Ideal for confined spaces.

- 2 Types:
  - Schedule 40 and Schedule 80
- Locking strap w/no-slip barbs and crush ribs
- Triple-lobed gasket to keep water out
- Insertion indicator
- Sizes: 3", 4", 5" and 6"
- Available in 10 and 20 foot lengths
- RUS Listed/UL Listed/
- Technical Info:
  - Bend radius: 65 Ft. minimum
  - Max. bore distance: 1000 Ft.
  - Seal pressure rating: 75 PSI

## Boreable Multi-Gard® Multi-Cell Conduit



Designed for horizontal directional drilling applications. Eliminates the need for trenches. Ideal for confined spaces. Pre-installed innerducts to save installation time and money.

- Type: Type 40
- Pre-installed innerducts: 3-way or 4-way
- Locking strap w/no-slip barbs and crush ribs
- Triple-lobed gasket to keep water out
- Insertion indicator
- Size: 4"
- Available in 10 and 20 foot lengths
- RUS Listed
- Technical Info:
  - Bend radius: 65 Ft. minimum
  - Max. bore distance: 500 Ft.
  - Seal pressure rating: 75 PSI

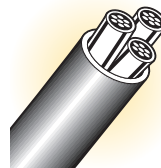
## HDPE Conduit (High Density Polyethylene)



Designed for direct bury applications. Available in a variety of sizes, colors and wall types to meet any application requirement

- Solidwall and corrugated
- Ribbed and smooth interior wall (solidwall ONLY)
- Standard, toneable and UL Listed available
- Available with pre-installed pull tape
- Sizes: 1/2" through 16"
- 18 wall types
- 13 conduit/stripe colors
- Sequentially marked footage
- Meets or exceeds ASTM test methods:
  - D-1505, D-1238, D-790, D-638, D-1693, and D-746

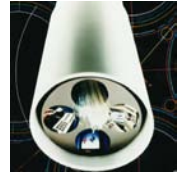
## Micro-Gard™ Mini Duct HDPE



Designed for micro-cable installation. Ideal for use in existing duct structures.

- Solidwall, smooth interior surface
- Material: 93408 pressure HDPE resin
- Available with 1 up to 5 mini ducts
- Sizes: 10/8mm, 12/10mm and 16/12mm
- Available with pre-installed pull tape in sizes 10/12mm and 16/12mm
- 10 stripe colors
- Sequentially marked footage

## Multi-Gard® Multi-Cell Conduit



Pre-installed innerducts to save installation time and money. No tools or cement required for assembly.

- 4 types available:
  - PVC: Type C, Type 40 & Type 80
  - Fiberglass
  - Galvanized steel/PVC-coated steel
  - EMT
- Pre-installed innerducts: 3-way or 4-way
- Innerducts are pre-lubricated and jettable
- Deep bell for extra strong joints
- Available in 10 and 20 foot lengths
- Gasketed to keep out water
- Internal spacers for longer pulls keep innerducts straight

## P&C Flex® Corrugated Flexible Conduit



Accommodates any degree of bend or bend radius requirement. Use as a raceway or sweep.

- Manufactured to IPS dimensions
- UV Resistant
- Sizes: 1/2" Through 4"
- Small put-ups for short runs
- Available with detectable tape

## Additional Items

### Distribution Enclosures



Durable and waterproof. Ideal for outdoor applications.

- Types: one door and two door
- Doors open 180 degrees
- Fully gasketed for a watertight seal
- Can be installed on the ground or a pedestal
- IP-43 self-ventilated and IP-54 watertight rating
- Material: fiberglass reinforced polyester

### PV-Mold® Pole Riser System

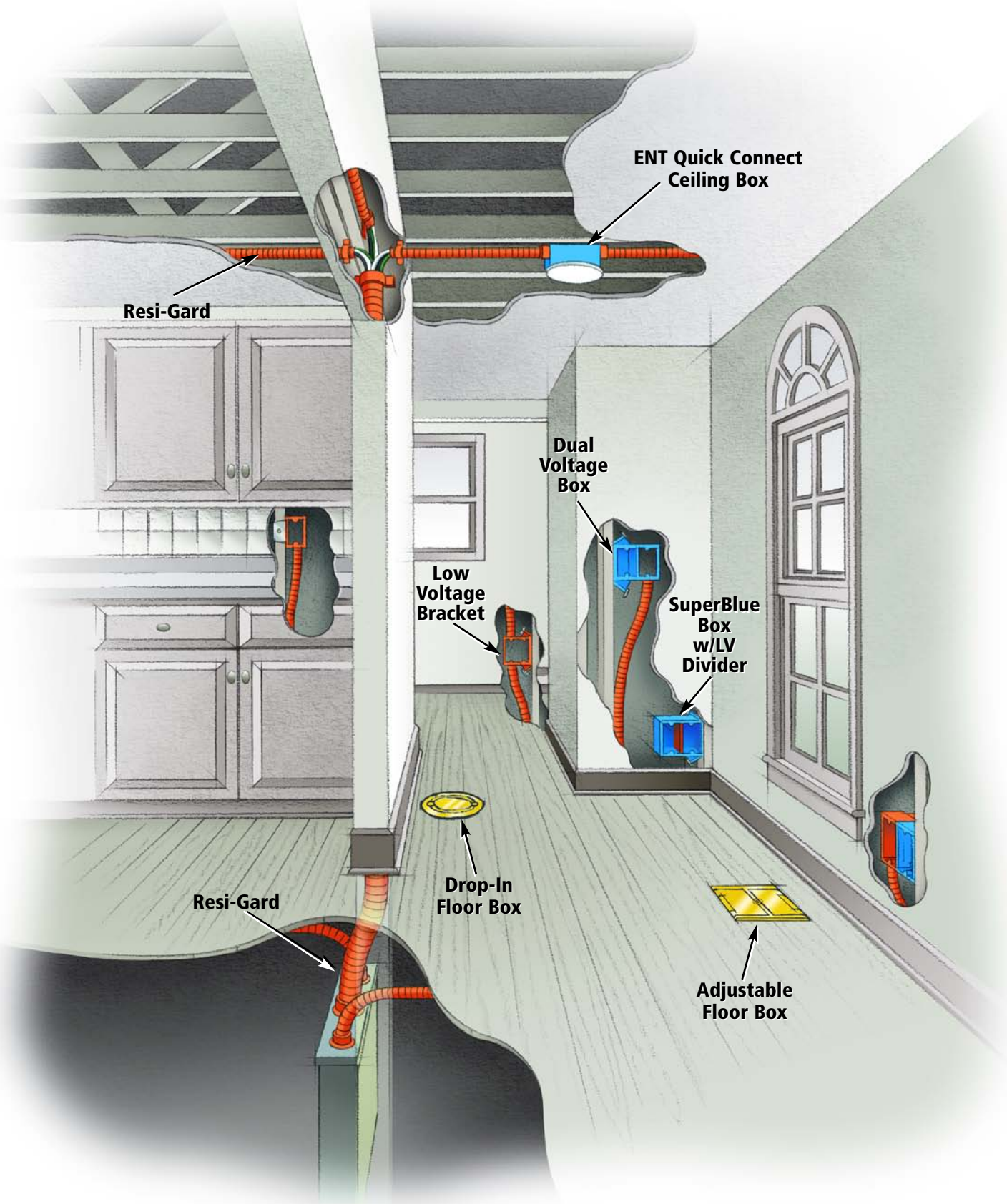


Protects communication cables installed on poles.

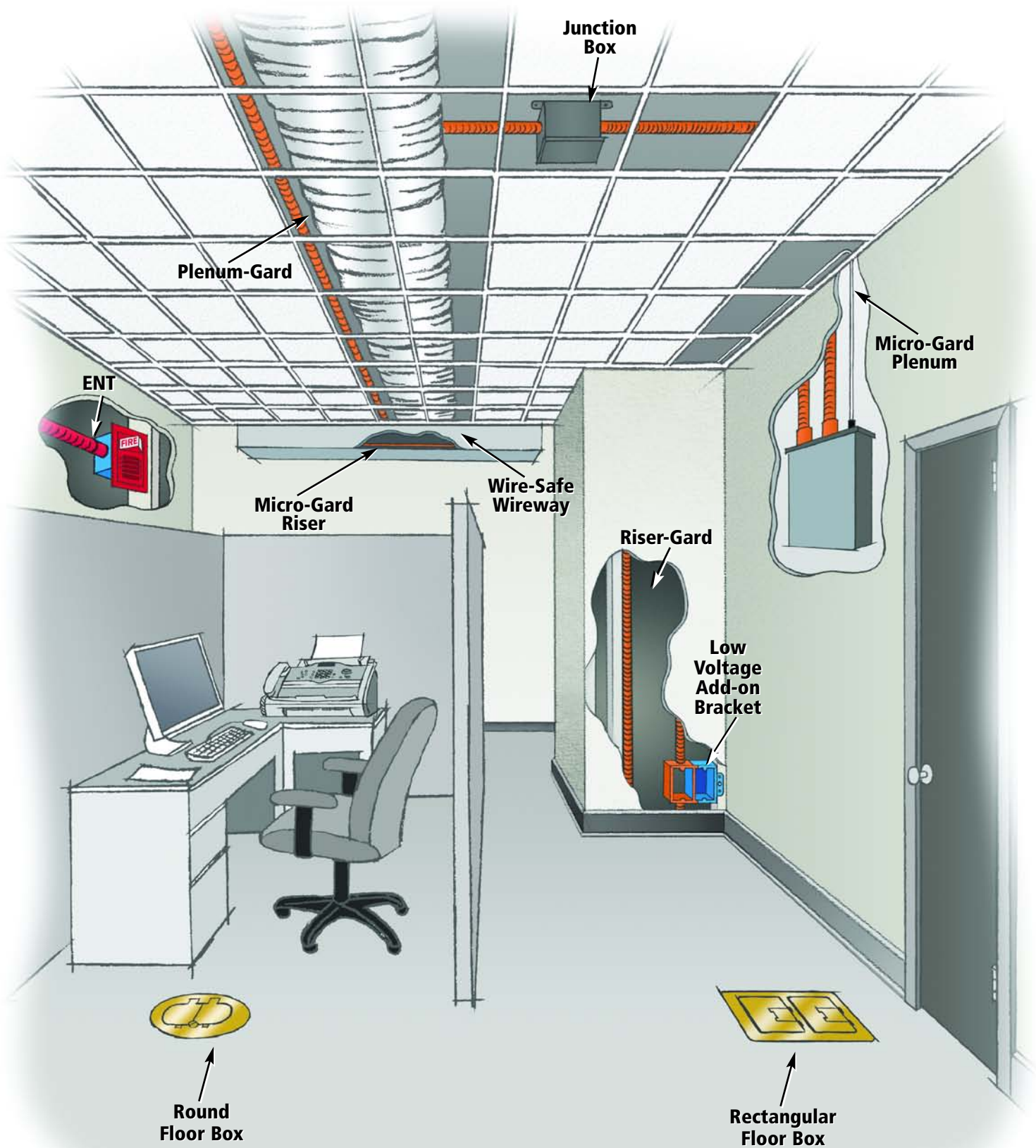
- Types: Standard duty, Heavy duty Schedule 40, and Extra heavy duty Schedule 80
- UV resistant
- No grounding required
- Sizes: 1-1/2" through 6"
- Available in 10 foot lengths
- Polyethylene boots and adapters available
- Nonmetallic. Will not rust or corrode



# Carlson® Premise FTTx Solutions

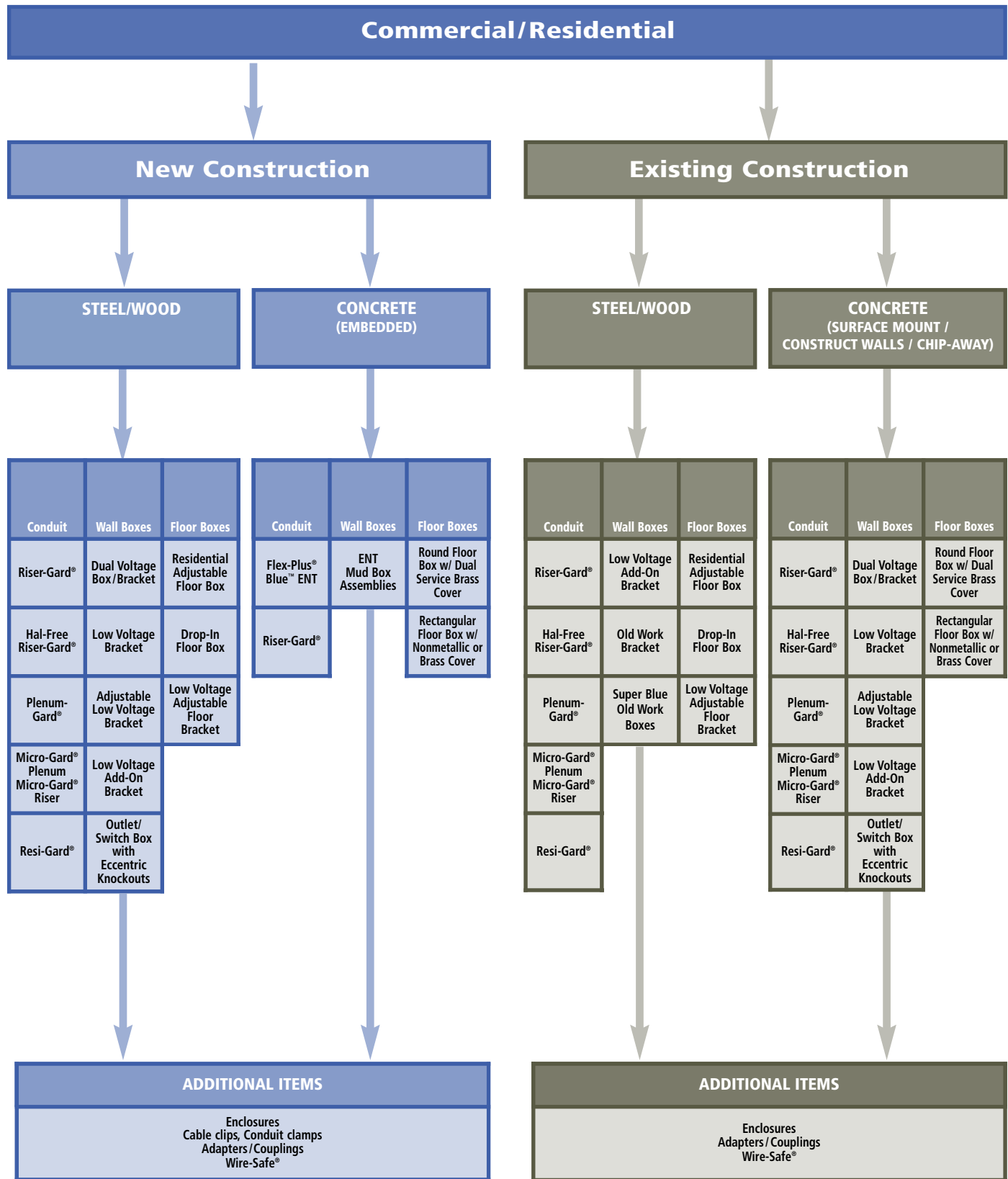


## Residential



# Commercial

# Product Application/Selection Guidelines





# Premise Conduit

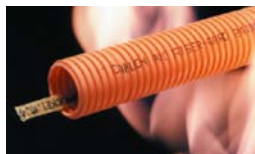
Organizes, protects, identifies and future-proofs wire and cable.

## Flex-Plus® Blue™ ENT (Electrical Nonmetallic Tubing)



- UL Listed and CSA Certified
- Concrete tight
- Manufactured to IPS dimensions for use with standard fittings
- Sizes: 1/2", 3/4", 1", 1-1/4", 1-1/2" and 2"
- Colors: blue, red and yellow
- Technical Information:
  - Recognized for use in 2-hour fire resistive non-load bearing and bearing wall assemblies
  - Recognized for use in fire resistive ceiling assembly

## Riser-Gard® Flexible Nonmetallic Conduit



- UL and c-UL Listed/FT-4 Rated
- For use with Optical Fiber, Communication, Remote Control, Signaling, Power Limited, and Coaxial Cables in Riser and General Purpose Applications as Defined in NEC Articles 725, 770, 800 and 820/ CEC Sections 56 & 60
- Manufactured to IPS Dimension for use with Standard Fittings
- Sizes: 3/4", 1", 1-1/4", 1-1/2" and 2"
- Color: orange – identifies low voltage wiring/cabling
- Available with Pre-Installed Pull Tape
- Sequentially marked footage
- Technical Information:
  - Meets/exceeds UL Standard 2024

## Hal-Free Riser-Gard® Flexible Nonmetallic Conduit



- UL and c-UL Listed/FT-4 Rated
- For use with optical fiber, communication, remote control, signaling, power limited, and coaxial cables in riser and general purpose applications as defined in NEC Articles 725, 770, 800 and 820/ CEC Sections 56 & 60
- Halogen Free – ideal for tunnels and labs
- Sizes: 1", 1-1/4", 1-1/2" and 2"
- Color: white
- Available with pre-installed pull tape
- Sequentially marked footage
- Technical Information:
  - Meets/exceeds UL Standard 2024

## Plenum-Gard® Flexible Nonmetallic Conduit



- UL and c-UL Listed/FT-6 Rated
- For use with optical fiber, communication, remote control, signaling, power limited, and coaxial cables in plenum, riser and general purpose applications as defined in NEC Articles 725, 770, 800 and 820/ CEC Sections 56 & 60
- Manufactured to IPS dimensions for use with standard fittings
- Sizes: 1/2", 3/4", 1", 1-1/4", 1-1/2" and 2"
- Color: orange – identifies low voltage wiring/cabling
- Available with pre-installed pull tape
- Sequentially marked footage
- Material: PVDF resin
- Technical Information:
  - Meets/exceeds UL Standard 2024

## Micro-Gard® Plenum and Micro-Gard® Riser



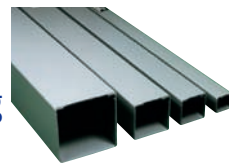
- **UL and c-UL Listed to 2024 for Plenum and Riser applications.**
- Two Sizes: 8/6mm and 12/10mm. The smaller sizes accommodate the size constraints of multi-dwelling units, and make installations faster and easier.
- Smooth interior wall eliminates snag points and provides low coefficient of friction regardless of whether jetting or pull-tape is used.
- Superior burn-through resistance for longer cable pulls.
- Pre-installed pull-tape makes installing cable faster and easier (option available for empty duct).
- Sequentially marked footage to easily identify lengths and reduce waste.
- Reel sizes from 1000 to 5000 feet for easy handling on the jobsite.
- Future-proofing raceway system for fast, easy wire/cable upgrades, changes, and moves.

## Resi-Gard® Flexible Nonmetallic Conduit



- UL and c-UL Listed/FT-1 Rated
- For use with optical fiber, communication, remote control, signaling, power limited, and coaxial cables in general purpose applications as defined in NEC Articles 725, 770, 800 and 820/ CEC Sections 56 & 60
- Manufactured to IPS dimensions for use with standard fittings
- Sizes: 3/4", 1", 1-1/4", 1-1/2" and 2"
- Color: orange – identifies low voltage wiring/cabling
- Available with pre-installed pull tape
- Sequentially marked footage
- Technical Information:
  - Meets/exceeds UL Standard 2024

## Wire-Safe® Wireway and Wiring Trough



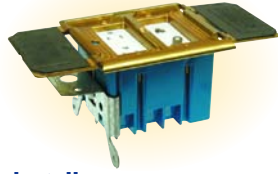
**Ideal for concealing/housing conduit and wires and cables**

- UL Listed
- Rugged yet lightweight
- Easy to cut and assemble
- Clip-on cover eliminates the need to pull wires and makes rewiring easy.
- Nonmetallic. Won't rust or corrode
- 4 Sizes: 2" x 2", 3" x 3", 4" x 4" and 6" x 6"

# Premise Floor Boxes

Flexibility. Easy to Install. Superior Aesthetics.

## Adjustable Floor Boxes



**Accommodates any floor covering. Fast and easy to install.**

- UL Listed
- Patented adjustment screw – adjusts to any floor depth (from 0" to 1-3/4")
- Steel mounting brackets – provides a secure mount
- Capacity: One-gang 20 cu. in.; Two-gang 34 cu. in.
- Sizes: One-, and two-gang
- Two-gang box offers dual service capabilities
- Covers available in solid brass, and nonmetallic white and ivory, and feature two-doors
- UL scrub water tested

## Low Voltage Adjustable Floor Bracket



**Designed for low voltage cabling. Accommodates any floor covering. Fast and easy to install.**

- UL and c-UL Listed
- Backless – accommodates large/deep devices
- Patented adjustment screw – adjusts to any floor depth (from 0" to 1-3/4")
- Steel mounting bracket – provides a secure mount
- Covers available in solid brass, and nonmetallic white and ivory, and feature two doors
- Includes a Leviton QuickPort Quad 106 insert
- Color: orange – identifies low voltage wiring/cabling
- UL scrub water tested

## Drop-In Floor Box



**The fastest, easiest way to put a floor socket any place you need it.**

- UL and c-UL Listed
- High or low voltage capability
- Single hole construction
- Capacity: 11.8 cubic inch
- Solid brass cover with a light lacquer finish for extra protection
- UL scrub water tested

## Rectangular Floor Box



**Designed to provide 3-way power, data and communication in the same box. Modularity provides flexibility, installation ease and cost-savings.**

- UL and c-UL Listed
- Modular (gangable) design – up to a three-gang box
- Triple service capability – power, data, and communication
- 6" Box Depth
- Easy trim out – simple saw cut to floor
- Molded-in hubs – 1"
- Drillable sides
- Covers are available in brass, and nonmetallic in one-, two-, and three-gang sizes
- UL scrub water tested

## Round Floor Box



**Designed to provide 3-way power, data and communication in the same box. Reduces installation time and saves money.**

- UL and c-UL Listed
- Triple service capability – power, data, and communication
- 6" box depth
- Cubic inch capacity markings inside the box
- Easy trim out – simple saw cut to floor
- Molded-in hubs – 1" and 3/4"
- Covers are available in brass, and nonmetallic
- UL scrub water tested



# Premise Wall Boxes/Brackets

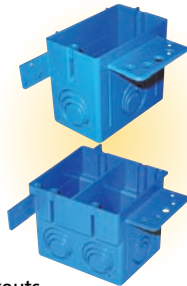
Flexible. Fast and easy to install. Lowers the overall installation cost.

## ENT Mud Box Assemblies - Nonmetallic



- UL and c-UL Listed
- Concrete tight
- 12 integral connectors – four 1/2", six 3/4", two 1"
- Styles: blank, ceiling, single-gang, double-gang, and 4" square
- Available with or without mounting feet
- Includes cement cap
- Material: polycarbonate

## ENT Outlet/Switch Box w/Eccentric Knockouts - Nonmetallic



- UL Listed
- Concrete tight
- 1/2", 3/4" and 1" knockouts
- Single gang: 22 cu. in.; Double gang: 38 cu. in.
- Double gang: dual voltage capability with use of divider
- Double gang box is also a 4" square box

## ENT Quick Connect Outlet/Switch Box - Nonmetallic



- UL Listed
- Concrete tight
- Styles: single gang (16 Cu. In.) and 4" square (20 and 30.3 Cu. In.)
- Available with 1/2" or 3/4" knockouts
- Mounting bracket for steel/wood installation
- Meets NEMA OS-2

## ENT Quick Connect 4" Octagon Ceiling Boxes



- UL Listed
- Listed for fixture support up to 50 lbs.
- 20.5 cubic inch capacity
- 2-1/8" box depth
- 1/2" and/or 3/4" knockouts
- Molded integral clamps

## SuperBlue™ Hard Shell Outlet/Switch Box - Nonmetallic



- UL Listed
- Heavy wall to prevent cracking/breaking
- Resists flexing and holds shape
- Largest wirefill capacity in their class
- Two mounting clamps
- Meets NEMA OS-2
- Divider available to convert box into dual service

## Junction Boxes



- UL Listed
- NEMA Type 4/4X Rating
- Foam-In-Place Gasketed Lids w/ Attached Stainless Steel Screws
- Textured Lids to Maintain Appearance
- 10 Sizes Available: 4X4X2 through 12X12X6
- Material: PVC or PPO Thermoplastic

## Dual Voltage Box/Bracket - Nonmetallic



- UL Listed
- Dual voltage capability
- 20.5 cubic inch capacity
- Accepts a two-gang face plate
- 3/4" Resi-Rings for Resi-Gard conduit connection

## Low Voltage Brackets - Nonmetallic



- UL and c-UL Listed
- Backless – accommodates large/deep devices
- Nail or screw mount options
- Color: orange – identifies low voltage wiring/cabling
- 3/4", 1", and 1-1/4" Resi-Rings
- One-, and Two-gang styles

## Low Voltage Adjustable Brackets - Nonmetallic



- UL and c-UL Listed
- Backless – accommodates large/deep devices
- Patented adjustment screw – adjusts to any wall thickness (from 0" to 1-3/4")
- Steel mounting bracket – provides a secure mount
- Removable bracket – upgrade from a one-gang to two-gang
- One-, and two-gang styles
- Color: orange – identifies low voltage wiring/cabling

## Low Voltage Old Work Brackets - Nonmetallic



- UL and c-UL Listed
- Backless – accommodates large/deep devices
- Rectangular flange with two mounting Clamps
- Marking holes to easily cut wall opening
- Chamfered corners – prevents racking
- One-, and Two-gang styles
- Color: orange – identifies low voltage wiring/cabling

## Low Voltage Add-On Bracket - Nonmetallic



- UL and c-UL Listed
- Provides a low voltage outlet next to an existing electrical box
- Accepts a standard two-gang faceplate
- Backless – accommodates large/deep devices
- Can be used with virtually any wall box
- Color: orange – identifies low voltage wiring/cabling
- 3/4" Resi-Rings for Resi-Gard conduit connection

# THE ONLY TOTAL SYSTEMS SOLUTION FOR LOW VOLTAGE CABLING!

Carlton offers a complete line of innovative **Boxes and Brackets** and **Flexible Raceways**.

- Quick and easy to install
- Organize and protect wires/cables
- Identify systems
- Future-Proof systems
- **SAVE MONEY!**

**Carlton**<sup>®</sup>  
LAMSON & SESSIONS

1-800-322-7566  
[www.carlon.com](http://www.carlon.com)



*Innovative Solutions For Wire and Cable Management.*

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