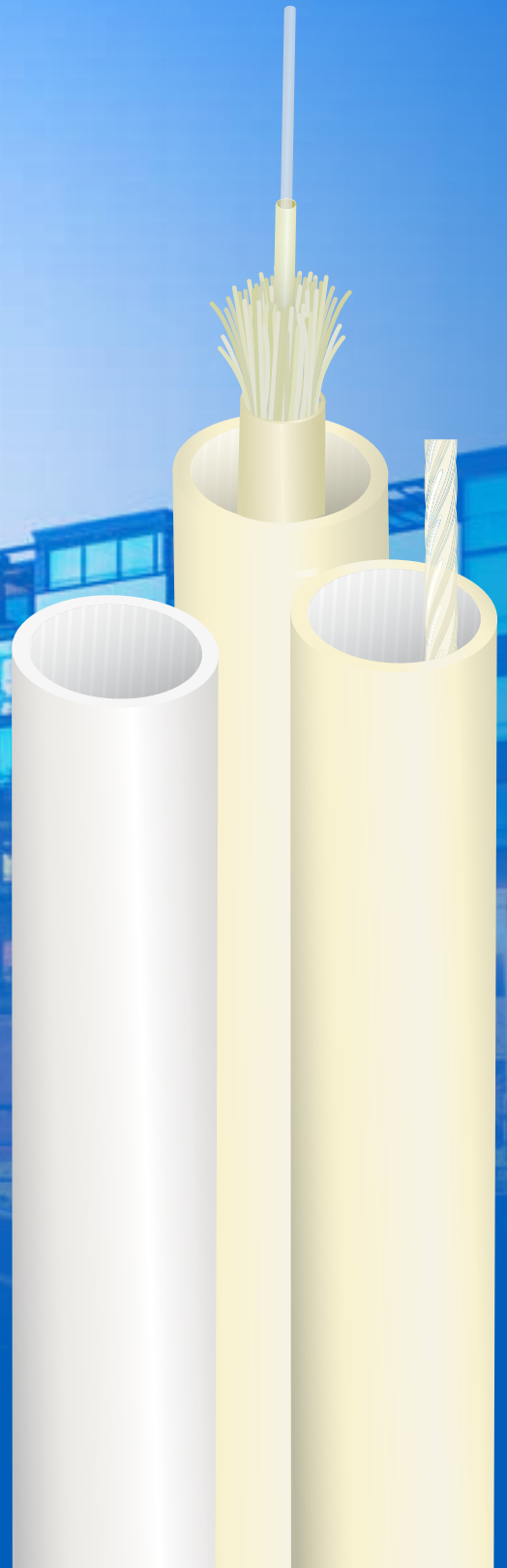


MDU

MULTIPLE DWELLING UNIT



 **dura·line**

PATHWAYS MAKE IT POSSIBLE

Why install fiber directly to individual living units?

- 25% of all households are Multiple Dwelling Unit's (MDU's) and those owners & renters are the most demanding broadband users
- If the MDU's are fiber ready, properties can realize 8% premium in US, and 2.5% in Canada (Reference: "Fiber Broadband Association (2017, October 16). Multiple Dwelling Unit. Retrieved from www.fiberbroadband.org")
- Only fiber can meet the expectations of high speeds, fast downloads, and property-wide wi-fi reliability
- Limitless broadband capabilities are an essential utility. Only fiber can handle future demand and support the growth of the Internet of Things (IoT)
- Telecommuters demand speed and reliability that only fiber can deliver
- Supports video-on-demand with little or no buffering

Why use a MicroDuct Pathway?

- MicroDucts are small ducts, (8.5mm–16mm in diameter) that can be installed for a permanent, reusable, behind-the-wall pathway for fiber optic cable placement
- Ideal for MDU and FTTX Installations
- MicroDucts meet necessary fire codes, available in Riser or Plenum material (UL 2024)
- The MicroDuct pathway allows for easy repair or future fiber upgrades
- Fiber Cable can be pre-installed in the MicroDuct for one-step installation of MicroDuct and Fiber Cable for the fastest, lowest cost installation
- Dura-Line stocks bend-insensitive single mode (BIF-SM) fiber cordage for quick turn-around on pre-installed fiber cable orders
- The MicroDucts can alternatively be supplied with a pre-installed Pull String for pulling in Fiber Optic cable at time of service request
- MicroDuct pathways can be installed in new construction (greenfield) or existing buildings (brownfield)

For Installation Guides or further information, contact

Customer Service: 800.847.7661

Training information available online: www.duraline.com/training

Riser and Plenum MicroDuct

- SILICORE™ super slick permanent lining
- Sequential footage markings
- UL/ETL specs for both US & Canada (CSA)
- Riser MicroDucts are dull yellow in color
- Plenum MicroDucts are opaque white in color
- Available with 50# pull string pre-installed
- Available with fiber pre-installed for one-step installation of fiber and MicroDuct pathway

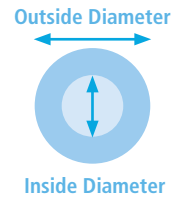
Fiber Cordage

- Dura-Line stocks bend-insensitive single mode (BIF-SM) fiber cordage for factory pre-installation into the MicroDuct



Riser and Plenum MicroDuct Specs

	OD/ID (MM)	NOM OD (MM/IN)	MIN ID (MM/IN)	WEIGHT (#/FT)	SAFE WORKING PULL STRENGTH (LBS) †	STANDARD PUT UP	WOODEN REEL
RISER	8.5/6	8.5/0.33	5.9/0.23	0.022	89	1,000'	24 "
						2,500'	24 "
	12.7/10	12.7/0.50	9.5/0.37	0.042	172	1,000	24 "
						2,500	35 "
	16/12	16/0.63	11.6/0.46	0.06	285	1,000	24 "
						2,500	35 "
PLENUM	8.5/6	8.51/0.33	6.7/0.26	0.024	89	1,000'	24 "
						2,500'	24 "
	12.7/10	12.7/0.50	10.2/0.40	0.049	177	1,000	24 "
						2,500	35 "
	16/13	16/0.63	12.8/0.51	0.08	293	1,000	24 "
						2,500	35 "



Riser MicroDucts:
ETL Listed to UL 2024 & CSA C22.2 No.262-04 and UL-94 V-2 & CSA FT4

Plenum MicroDucts:
ETL Listed to UL 2024 & CSA C22.2 No.262-04 and UL-94 V-0 & CSA FT6

For MDU MicroDuct Installation, use a sweeping bend radius of 13". MicroDucts can sustain a much tighter bend radius, however, the sweeping bend radius ensures easy cable placement and future upgrades.

Recommended Installation Tools



Round MicroDuct Cutter



Straight MicroDuct Cutter



Straight Coupler

PART #	DESCRIPTION
20001745	Round MicroDuct Cutter
20001856	Straight MicroDuct Cutter
20001834	8.5mm Coupler
20001832	12.7mm Coupler
20001517	16mm Coupler
20002885	FlexClip with Screw



Modular MicroDuct Mounting Brackets

PART #	DESCRIPTION*	COLOR	† MICRODUCT #
20002120	8.5mm MicroDuct Wall Mounting Plate (includes wall plate, base bracket, and 3 screws; top mounting bracket ordered separately)	Orange	8
20001719	8.5mm MicroDuct Top Mounting Bracket (each bracket secures a row of 8 MicroDucts, w/3 screws)	Orange	8
20002121	12.7mm MicroDuct Wall Mounting Plate (includes wall plate, base bracket, and 3 screws; top mounting bracket ordered separately)	Orange	8
20001929	12.7mm MicroDuct Top Mounting Bracket (each bracket secures a row of 8 MicroDucts, w/3 screws)	Blue	8
20003574	16mm MicroDuct Wall Mounting Plate (includes wall plate, base bracket, and 3 screws; top mounting bracket ordered separately)	Orange	6
20003575	16mm MicroDuct Mounting Bracket (each bracket secures a row of 6 MicroDucts, w/3 screws)	Black	6

*To complete first row order (1) Wall Mounting Plate and (1) Top Mounting Bracket. For additional rows, order top mounting brackets as required / † Number of MicroDucts per bracket



Plumett P2P V20



Conduit FlexClip with screw

Extra Items:

- Clamps
- Wall clips
- Cable strap clamps
- Cable supports
- Sharpie
- Cover for long term outside storage (to protect from UV rays)

In greenfield installations, the MicroDuct pathway should be placed prior to the dry wall installation.

MDU Route Guidelines

When placing MicroDuct:

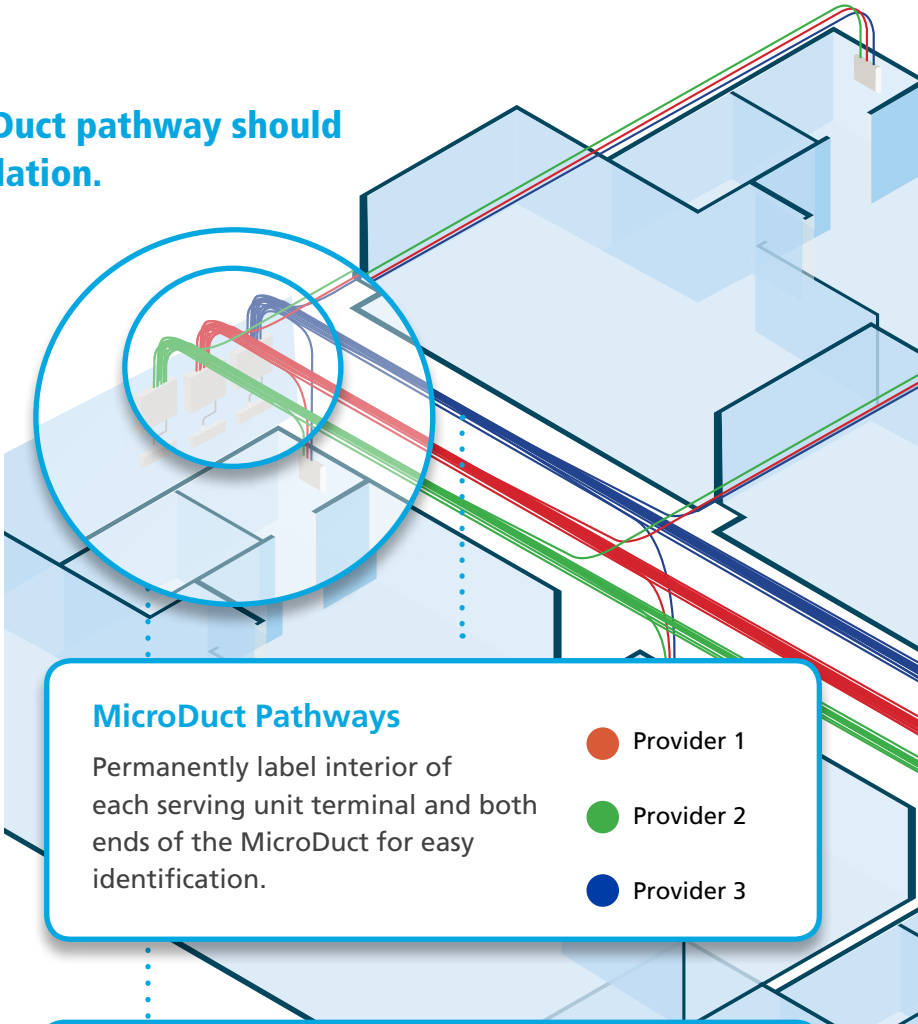
- Number of bends should not exceed eight 90° turns, or sixteen 45° turns
- Bends of 45° or less are easier to pull through and should be used when possible
- Run lengths of 200' are recommended, but routes can be designed with longer distances
- Long sweeping bends are encouraged with a minimum 13" bend radius for easiest fiber cable installation or removal for repair or upgrades

REMEMBER:

- *If storing the MicroDucts outside, protect from prolonged exposure to the sun*
- *Install in accordance with all local fire codes*
- *Avoid shortcuts that affect installation quality*

Bend Radius Gauge

- Each shipment of MicroDuct should contain a Bend Radius Gauge that will be taped to the outside of the reel.
- The bend radius gauge serves as a guide to encourage sweeping bends in the MicroDuct pathway for all future fiber installations.

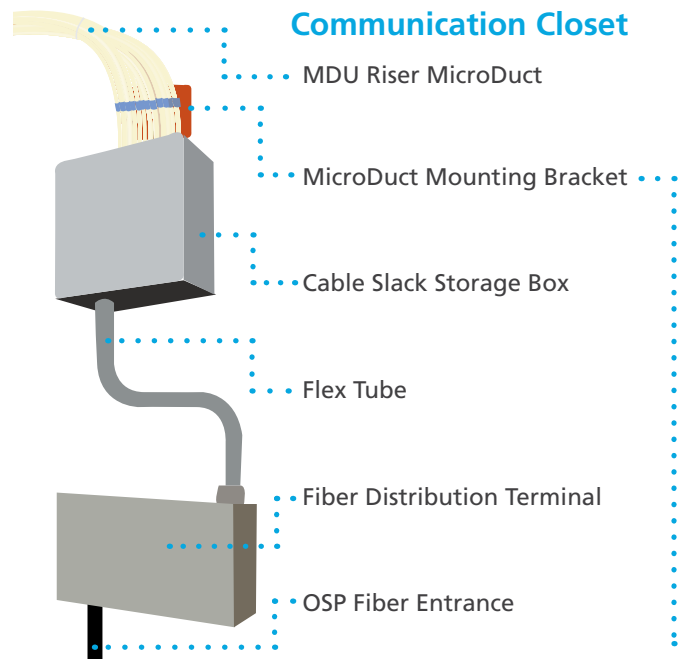


MicroDuct Pathways

Permanently label interior of each serving unit terminal and both ends of the MicroDuct for easy identification.

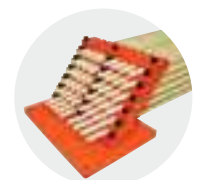
- Provider 1
- Provider 2
- Provider 3

Communication Closet



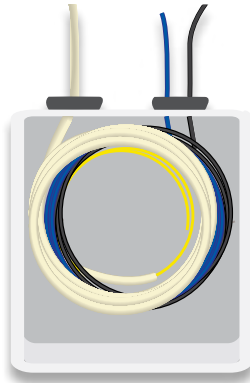
MicroDuct Mounting Brackets

MicroDuct Mounting Brackets are available for the following MicroDuct sizes: 8.5mm, 12.7mm and 16mm.



For more detailed installation information, see Technical Bulletin DCEB-06004

Serving Unit Terminal



Serving Unit Terminal

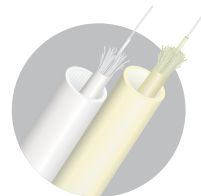
- When MicroDuct reaches the serving unit terminal, insert MicroDuct and pull 8' to 10' of MicroDuct into terminal housing. Coil MicroDuct and secure with cable ties.
- Do NOT remove the MicroDuct from the cable in the terminal housing. Secure MicroDuct with connector or a cable strap clamp. Avoid sharp bends.
- If MicroDuct kinks, pull additional MicroDuct into terminal housing and remove kink, or remove and discard damaged MicroDuct.

Fiber Installation Options:

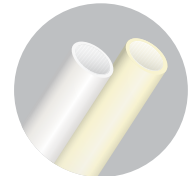
(further details on following page)



Pull String



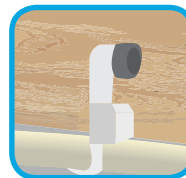
Pre-installed Fiber



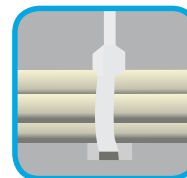
Empty – ready for Cable Jetting

MDU Installation Techniques

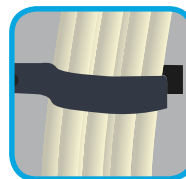
- For straight runs, either horizontal or vertical, secure MicroDuct every 16" - 24"
- Plastic cable strap clamps recommended (A)
- On runs with multiple MicroDucts, use two-hole cable straps or cable ties (B)
- MicroDucts should be properly secured along entire length of route (C)
- Utilize nail plate prior to dry wall installation (D)
- Do not over tighten cable ties or crush MicroDuct
- Label MicroDucts at both ends, preferably at three places, outward facing for easy ID
- MicroDuct Organizing Bracket is designed to be used where multiple MicroDucts are terminated



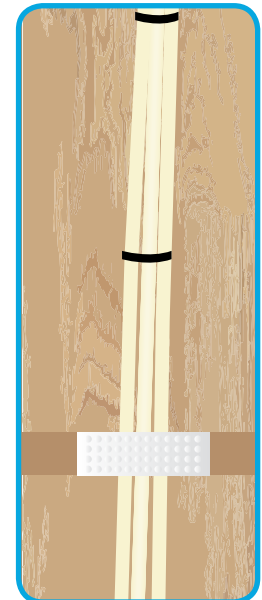
A



B



C



D

In brownfield installations, the building construction will dictate the best installation method.

Things to consider for Brownfield MicroDuct Installations:

- MicroDuct pathway is typically installed outside via a protective raceway
- Ideal with attic access
- Best suited for buildings with five stories or less
- Behind the wall installations are typical, however surface-mount installations are common as well

Riser and Plenum MicroDuct

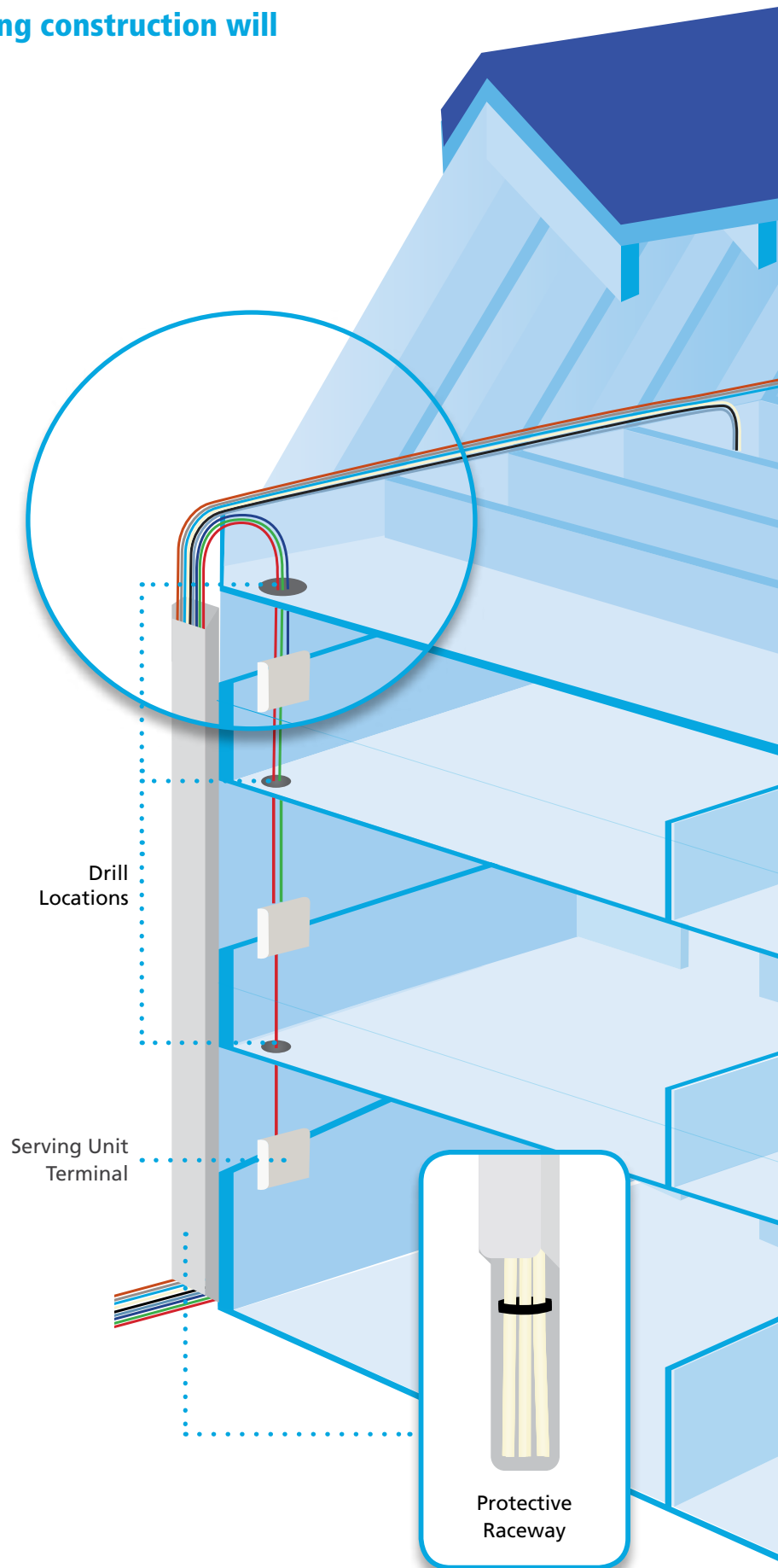
- SILICORE™ super slick permanent lining
- Sequential footage markings
- UL/ETL specs for both US & Canada (CSA)
- Riser MicroDucts are dull yellow in color
- Plenum MicroDucts are opaque white in color
- Available with 50# pull string pre-installed
- Available with fiber pre-installed

Fiber Cordage

- Dura-Line stocks bend-insensitive single mode (BIF-SM) fiber cordage for factory pre-installation into the MicroDuct

REMEMBER:

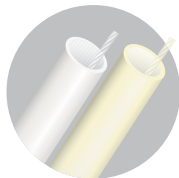
- *Protect the MicroDucts from exposure to the sun with permanent raceway*
- *Install in accordance with all local fire codes*
- *Avoid shortcuts that affect installation quality*



Typical Installation:

- Pull the MicroDuct from the outside of the building to the attic level
- Penetrate the attic wall or enter through the soffit
- Use a raceway to protect the exposed MicroDuct on the outside of the building
- Choose a utility room or closet to locate the MicroDuct pathway
- From the attic floor, drill a hole large enough for all MicroDucts to be pulled, one per each floor
- Pull the MicroDuct bundle from the attic to the top floor
- Drill through the floor to access the next level
- Pull the MicroDuct bundle, dropping one MicroDuct at each floor, as you move down through the levels.
- The MicroDuct & Pull String are cut and stored in the Serving Unit Terminal placed in close proximity to a power source

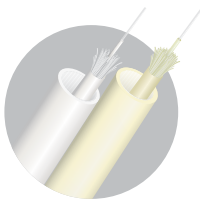
Fiber Installation Options



Pull String

Pull String: MicroDucts can be provided with factory pre-installed pull string for fiber placement at a later date.

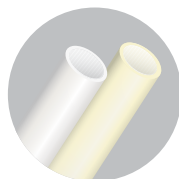
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Pre-installed Fiber

Pre-installed Fiber: MicroDucts can be provided with factory pre-installed fiber for easy one-step placement of fiber and MicroDuct pathway.

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Empty

Empty: MicroDucts can be provided empty for future cable placement. Hand-held cable jetting equipment can be used to install fiber quickly and easily.

