EZ-Bend® Cable Installation

1. General Information

1.1 This document provides recommendations for EZ-Bend® cable installation in typical single family and MDU applications. While every effort has been made to provide a useful installation guide, each installation environment is different and may require procedures not covered in this document. If you have questions or concerns about a particular application, please contact OFS for further information.

1.2 EZ-Bend cables are available in both 3.0 mm and 4.8 mm outer diameters. The cables are available in indoor/outdoor, riser, plenum, and low-smoke zero-halogen designs. The unique design of EZ-Bend cable allows the use of installation procedures similar to those used for CAT-5 wiring. EZ-Bend cables can be pulled into conduit, routed through interior walls, and installed around corners without using bend limiters. In addition, ***EZ-Bend Ruggedized Cable***[1] can be stapled in place using standard cable staplers and rounded staples.

1.3 To facilitate connectorization, the outer jacket of EZ-Bend cable is loosely coupled to the fiber and strength members. Consequently, pulling directly on the outer sheath of the cable may cause excessive strain (elongation) of the cable jacket. When the pulling load is released, the outer jacket returns to its original length which may buckle and damage the optical fiber. To avoid potential damage, EZ-Bend cable should be installed by pulling directly on the aramid strength members.

2 Attaching a Pull Line to EZ-Bend Cable

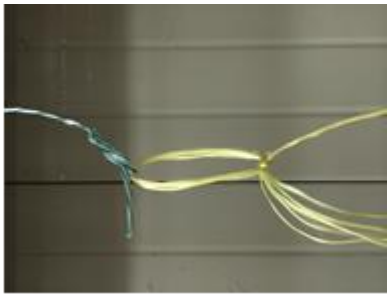
2.1 The following procedure should be used to attach EZ-Bend cable to a hand line or pulling line when installing the cable through interior walls or conduit.

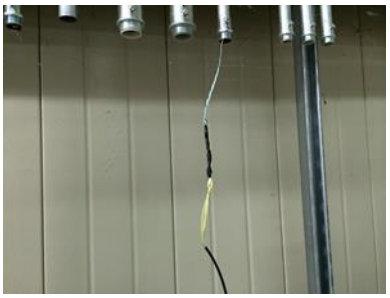
2.2 Expose the aramid strength members and attach the cable to the pull line as described below.

Step 1. Strip off about 12-18 inches of outer jacket from the EZ-Bend cable. The outer jacket can be removed using conventional wire strippers (10 AWG for 4.8 mm cable or 16 AWG for 3.0 mm cable), or it can be scored and removed using a buffer tube scoring tool. Cut and remove the exposed 900 µm buffered fiber.

[1] All EZ-Bend 4.8 mm cables can be stapled; however, only the ***ruggedized*** version of indoor/outdoor EZ-Bend 3.0 Cable, part # IR30-001C-DRK-4, is approved for stapling applications.

Step 2. Twist the aramid strands together into a single bundle. If pulling more than one cable, expose the strength members of all cables and twist them all together. If desired, tape the end of the bundle to hold the aramid strands together. Tie the strength members to the pulling line using a fisherman's knot or bowline.





Step 3. Wrap the knots with vinyl tape. The cable is now ready for installation.

3 Pulling EZ-Bend Cable

3.1 If the cable is provided on reels, mount the cable on a reel holder so that the cable feeds off the top of the reel. If two or more cables are pulled together, arrange the reels in a straight line and pull each cable over the top of the adjacent reel as shown in the photo. Ensure that the cable does not rub against the reel flange during payoff.

3.2 Inspect the cable reels for crossovers and/or slack coils which may get tangled during the pull. If slack coils are present, carefully pull the slack cable off the reel and neatly rewind. At the conclusion of the installation, staple the end of the cable to the reel flange to keep the cable tightly wound on the partial reels.

3.3 To prevent cable damage, it is recommended that two craftsmen be used to install long lengths of EZ-Bend cable – one to pull the cable and one to feed slack cable and tend the cable reels (or REELEX[2] cable in a box).

3.4 ***EZ-Bend cable has a maximum load rating of 100 lb. Exceeding the maximum load rating may damage the cable.***

3.5 EZ-Bend cable should not be pulled around wall studs or floor joists. Instead, slack cable should be pulled forward to that point and fed by hand around the stud or joist.

[2] REELEX is a registered trademark of REELEX Packaging Solutions, Inc., Paterson, NY.

4 Pulling Slack Cable

4.1 Exercise caution if slack cable must be pulled by gripping the outer cable jacket rather than pulling on the aramid strength members. If excessive tension is applied to the outer jacket, the jacket may elongate causing fiber buckling and damage.

4.2 On difficult cable pulls, slack cable should be pulled forward by hand starting at the cable reel. Grip the cable(s) by hand and pull slack cable from the reel while laying it on the floor. If the cable pull becomes difficult, or if there is noticeable stretch or deformation of the cable jacket, return to the cable reel and pull additional slack cable from the reel. After laying out the required slack, pull the cable end forward while feeding slack from the midpoint of the installation.

5 Pushing EZ-Bend Cable into Duct

5.1 If a pulling line is not provided, EZ-Bend cable can be pushed into the duct. The maximum push length is dependent on many variables including the route geometry, duct type and size, bulk cable vs. connectorized cable, etc. The following table lists the maximum expected cable length that can be pushed into the duct for typical conditions. Note that the minimum required duct ID for connectorized cable is 9.6 mm.

Maximum EZ-Bend Pushing Lengths

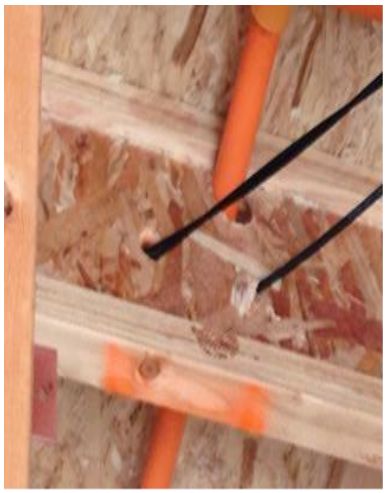
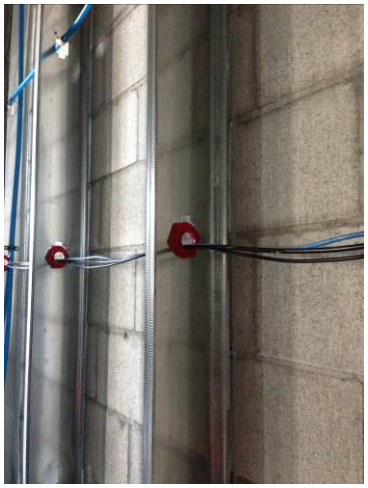
Cable Type	Duct	
	8.5/6.0 mm	12.7/9.6 mm
EZ Bend 3.0 (no connector)	160 ft	210 ft
EZ Bend 3.0 (connectorized)	NA	80 ft
EZ Bend 4.8 (no connector)	70 ft	170 ft
EZ Bend 4.8 (connectorized)	NA	115 ft

6 Applications

6.1 EZ-Bend cable can be installed in a many applications including new and existing MDUs and single-family homes. The cable can be installed through interior walls, pulled into conduit, and wrapped externally around a home from the NIU to the desired entry point into the structure. The following photos show examples of typical applications

6.2 EZ-Bend cable can be installed through interior walls as shown in the following photos. The cable can

be installed in both steel- and wood-frame construction. Drill the wall studs at the same height to maintain straight alignment of the cable as it is pulled through the wall. The cable should not be pulled over the edge of wood or steel wall studs.

6.3 EZ-Bend cable can also be stapled or fastened with cable ties as shown in the following photos. As mentioned before, only ***ruggedized*** versions of EZ-Bend cable can be stapled. Standard CAT-5 cable staplers (Arrow T25, Acme 25A, or equivalent) and rounded cable staples (Arrow T25, Acme 25A, or equivalent) must be used to staple the cable. EZ-Bend cable can be routed (but not pulled) around corners and moldings without the use of bend limiters.



6.4 EZ-Bend Indoor/Outdoor cable can be used in exterior installations as shown in the following examples.

6.5 EZ-Bend cable stapled to the exterior wall of the living unit.

6.6 EZ-Bend cable fastened to an existing conduit using cable ties.

6.7 Installing EZ-Bend cable through a conduit into the attic of a home.

6.8 Installing EZ-Bend cable through the soffit into the attic.

6.9 EZ Bend Cable can be fastened to masonry walls using shark tooth anchor clips[3] or similar fasteners.

6.10 EZ Bend Cable terminated on the interior wall of the living unit.

7 Direct Buried Installation

7.1 EZ-Bend Ruggedized 4.8 Indoor/Outdoor cable may be used in direct buried applications between the curbside distribution terminal and living unit. EZ-Bend 4.8 cable may be trenched or plowed using static or vibratory drop wire plows. During installation, the minimum recommended bend radius of EZ-Bend 4.8 cable is 48 mm. The minimum bend radius applies to the cable feed chute, cable troughs, guide rollers, etc.

7.2 If the cable is trenched, the trench bottom shall be free of rocks, stones, clumps of frozen material, and other debris that may damage the cable. The trench bottom should be raked free of all debris prior to cable placement. If the trench bottom contains rocks or debris that cannot be removed, a 2" layer of sand or rock-free spoil should be placed on the trench bottom prior to cable placing. Backfill the cable with several inches of select fill, e.g., sand, crushed stone dust, or sandy soil.

7.3 In plowed installations, OFS plastic reels (10-inch diameter) of EZ-Bend 4.8 cable may be mounted on the reel carrier of the drop wire plow as shown in the following photo. The cable delivery system must safely guide the cable from the reel into the cable chute without violating the 48 mm minimum bend radius. Large bulk reels of EZ-Bend 4.8 cable cannot be mounted on the reel carrier because excessive cable tension may occur during installation. If the EZ-Bend 4.8 mm cable is provided on large bulk reels, the cable must be pulled off the reel and laid on the ground along the cable route. The cable must then be hand fed into the cable feed chute during the plowing operation.

[3] Shark tooth anchor clips are available from EZ Cable Clips, St. George, UT.

7.4 The cable feed chute should have a removable gate to allow the cable to be removed at any point between splice locations. The cable path inside the feed chute must be free of burrs, sharp edges, excessive surface roughness, and debris. Internal guide rollers are not recommended. Do not allow dirt and debris to accumulate inside the cable chute. Clean the interior of the cable chute at the start of each installation.

7.5 Starting and finishing pits should be dug at the splice locations prior to the start of plowing. Lower the plow blade into the starting pit and pull the required slack through the plow chute to the splice point. Coil the slack cable and store as required for splicing or termination.

7.6 Secure the cable at the splice location to prevent cable movement at the start of the plowing operation. Start the plowing operation smoothly and slowly and gradually increase speed after all cable slack is removed from the cable delivery system. Plow attitude and depth should be changed gradually and only while the tractor is moving. If it is necessary to raise the plow share to the surface when the tractor is stopped, the cable should be excavated for a short distance behind the plow to prevent kinking the cable over the feed chute exit. Under no circumstances should the plow be backed up with cable in the chute.

7.7 The plowing operation should be continuously observed for obstructions, proper feeding of cable, maintaining proper depth, etc. Once the cable plow has reached the finishing pit, the plow can be raised and the cable can be removed from the plow chute. Feed the cable into the splice point, coil the slack cable, and store as required for termination.

7.8 Additional guidelines are available in OFS IP-012, *Direct Buried Cable Installation*.

For additional information please contact your sales representative. You can also visit our website at www.ofsoptics.com or call 1-888-FIBER-HELP (1-888-342-3743) from inside the USA or 1-770-798-5555 from outside the USA.

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