

Table of Contents

1.	General	1
2.	Precautions	2
3.	Tools and Materials	2
4.	Cable Cutting and Respooling:	3
	Appendix A - Minimum Drum Sizes by Measured Cable Outer Diameter (OD).	8
	Appendix B - Respooling Checklist	9

1. GENERAL

1.1 Improper use of a respooler (Figure 1) can cause damage to a cable jacket or result in wavy fiber in tight buffered cables due to cable crossovers or excessive tensile loading. This document provides a recommended procedure for cutting and respooling Corning Cable Systems fiber optic cables.

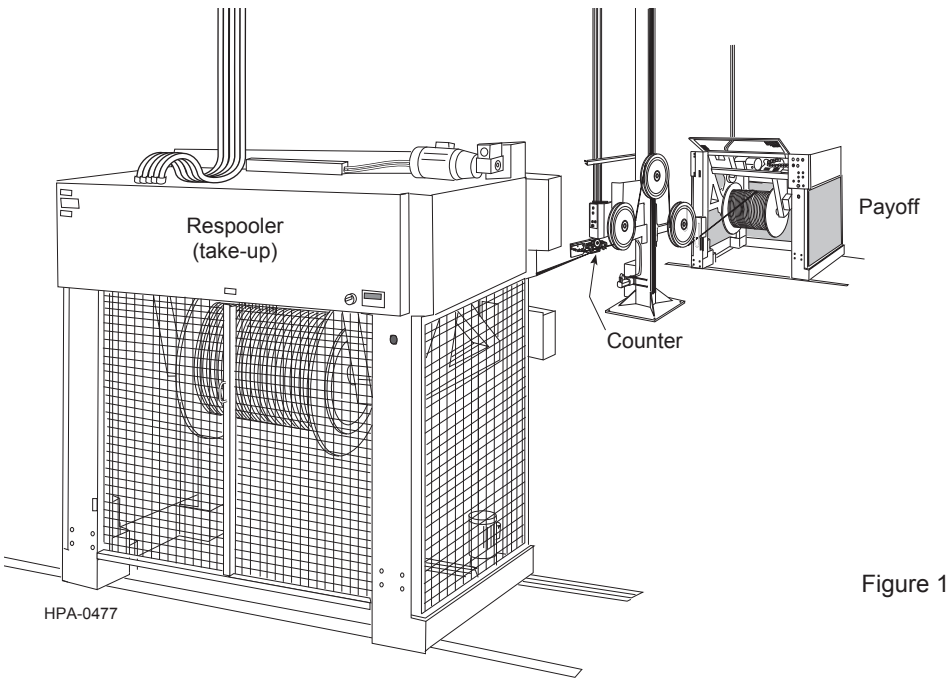


Figure 1

1.2 Figure 2 illustrates the reel and equipment terminology used in this procedure. Note that some features, e.g., tail flanges, are not present on every reel, and that wooden and steel reels vary in design..

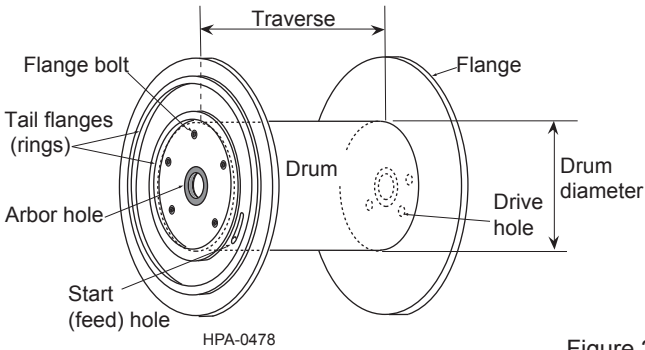


Figure 2

1.3 This issue includes an updated format and revised illustrations.

2. PRECAUTIONS

2.1 Safety Precautions



CAUTION: Before starting any cable respooling operation, all personnel must be thoroughly familiar with Occupational Health and Safety Administration (OSHA) regulations and company safety practices and policies.



CAUTION: To avoid personal injury, observe standard safety precautions. Wear personal protective equipment (headgear, eyewear, gloves, etc., as specified by your company's practices.

2.2 Cable Handling Precautions

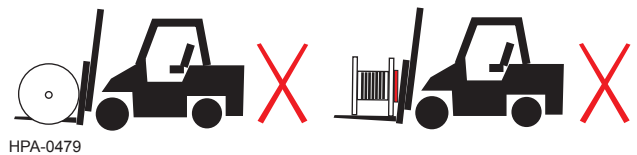
NOTE: Care must be taken to avoid cable damage during respooling and handling. Fiber optic cable is sensitive to excessive pulling, bending, and crushing forces. Consult the cable specification sheet for the cable you are installing. Do not bend the cable more sharply than the minimum recommended bend radius. Do not apply more pulling force to the cable than specified. Do not crush the cable or allow it to kink. Doing so may cause damage that can alter the transmission characteristics of the cable; the cable may have to be replaced.

2.3 Cable Reel Precautions

NOTE: Inspect and repair all reels prior to use. Check the inside of the reel flanges for objects that could damage the cable as it pays off. Changes in temperature and humidity can cause the wooden components of the reel to swell and contract allowing the flange bolts to loosen over time. Loose flange bolts may cause the cable to become entangled and possibly damage the cable during respooling—ensure all flange bolts are tight prior to loading the reel.



NOTE: To prevent crushing the cable tail between the reel and the fork truck, never pick up a reel from its tail-flange side. Always use proper reel-carrying procedures when using a forklift.



3. TOOLS AND MATERIALS

3.1 In addition to the cable being respooled, the following tools and materials are required for this procedure:

- Respooler
- Counter
- Cable cutter
- Reel
- Reel handling equipment (forklift or hand truck)
- Staples, hammer, cable ties (depending on reels)
- Hand micrometer or dial calipers
- Vinyl tape (depending on cable)

4. CABLE CUTTING AND RESPOOLING:

4.1 Locate the cable to be cut and respooled. Verify the part number and length on customer order with cable reel data sheet. Double check this information before proceeding.

4.2 The take-up reel must have sufficient drum size to maintain cable minimum bend radius and to have enough capacity for the cable being respooled while also allowing for flange free space (typically 2 inches). Reels with too small of a drum can cause damage to the cable and result in high attenuation. To determine the necessary take-up reel size:

- Measure the outer diameter (OD) of the cable being respooled, using a calibrated measurement tool such as a band micrometer or dial calipers.
- Refer to Appendix A which lists the acceptable minimum reel drum size for the measured cable outer diameter.
- Select a take-up reel with sufficient drum size to maintain cable minimum bend radius. The drum diameter should be a minimum of 8 inches or 30 times the cable outer diameter.
- Refer to Tables 1 and 2 for general reel sizes and capacities to verify the drum choice.

Reel Sizes	Reel Dimensions (Flange x Traverse x Drum)
A	20 in. x 20 in. x 16.5 in.
B	18 in. x 12 in. x 10 in.
C	24 in. x 16 in. x 12 in.
D	6 in. x 28.5 in. x 30 in.
E	41 in. x 28.5 in. x 30 in.

Table 1: Reel sizes

Reel Capacity (in feet)					
Cable Outside Diameter (inches)	Reel Size A	B	C	D	E
0.12	8200	1080	20670	–	–
0.24	1970	2330	5575	7545	18045
0.36	855	1115	2360	3300	8200
0.48	590	660	1640	2230	5250
0.60	330	460	855	1180	2890
0.72	–	330	720	985	2330
0.84	–	–	460	590	1575
0.96	–	–	330	525	1150
1.08	–	–	–	360	855
1.20	–	–	–	–	720

Table 2: General reel capacities

4.3 Move the cable to the payoff using a forklift, hand truck, etc.

4.4 To load the reel on payoff:

- Roll the reel under the payoff so that the cable comes off the top of the reel towards the counter and respooler (takeup) (see Figure 1).
- Place the payoff pintles into the reel's arbor holes.
- Raise the reel.

4.5 Load the empty reel into the respooler (take-up), making sure that the start hole and tail flanges and drive holes are on the correct side of the respooler.

4.6 Move the respooler reel flange with the feed hole so that it is aligned with the point where the cable exits the counter (Figure 3).

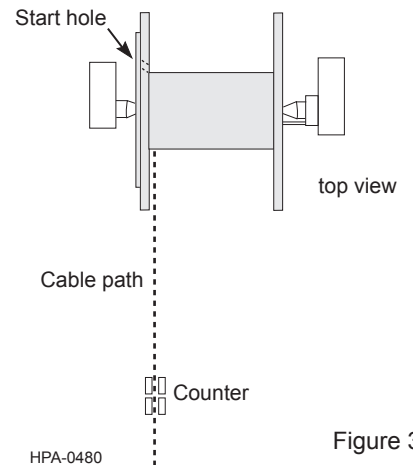


Figure 3

4.7 Proper traverse travel is critical for the cable to be snug and straight on the take-up reel. Set the traverse travel distance by adjusting left and right traverse limits so that the traverse travel direction will reverse at the proper locations to allow for the applicable reel width (Figure 4).

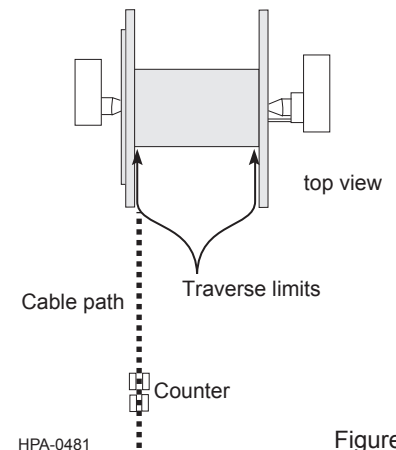


Figure 4

4.8 Set the respooler speed for the cable based on the cable outer diameter which is determined from either the cable specification or from measuring the cable.



Excessive take-up speed may cause cable damage due to excessive tensile force being placed on the cable.

4.9 Before creating a tail, check the length marking on the end of the cable. Using the length marking and the order length, calculate the length marking at which the cable is to be cut. Record this calculated length marking.

4.10 After resetting (“zeroing”) the counter, pull the top end of the cable from the payoff through the counter rollers and guides and then through the start hole in the take-up reel flange (inside to outside)(Figure 5).

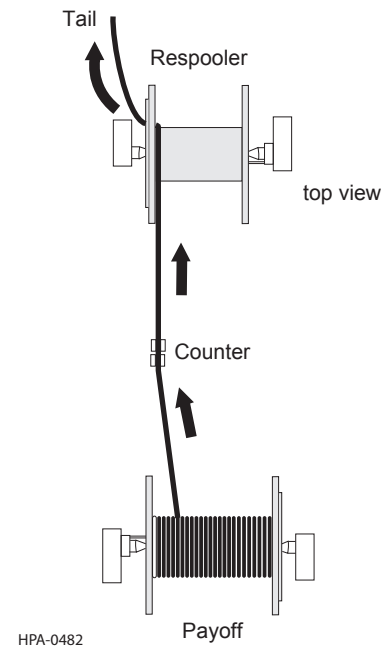


Figure 5

4.11 Pull a ten to fifteen foot length of cable through the start hole to create a tail for subsequent testing of the cable on the reel.

Special Note for MIC cable only:

If respooling MIC® cable, bend the first inch of cable 180° over itself and secure the cable end with a tape wrap. This will minimize possible fiber movement during the respooling process (Figure 6).

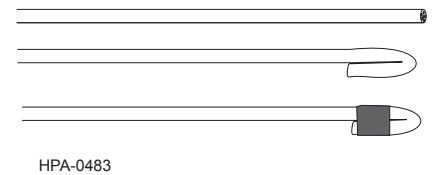


Figure 6

4.12 To secure the tail on reels that are:

Wooden with tail flanges

Route the tail between the tail flanges and secure the tail with plastic straps (Figure 7). To help keep the cable snug on the drum during respooling, staple an open cable tie near the start hole and then use it to secure the cable (Figure 7, inset).

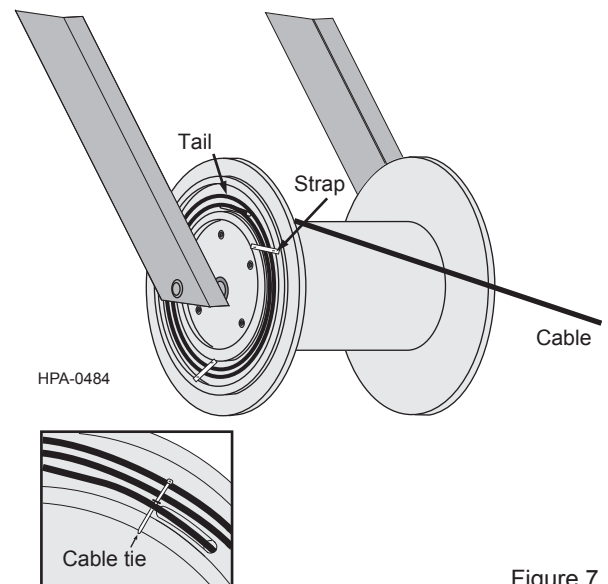


Figure 7

Wooden with no tail flanges

Apply a cable tie on the cable end and staple the tie to the reel near the start hole (Figure 8).

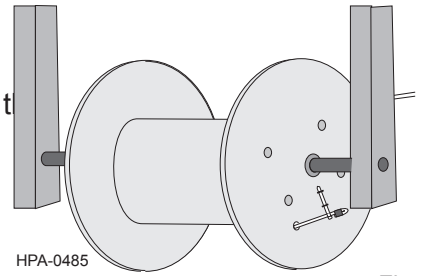


Figure 8

Steel Reels

Secure the tail inside the reel with cable ties (Figure 9).

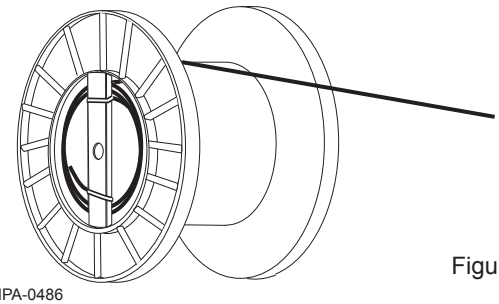


Figure 9

NOTE: The respooler take-up and payoff should be powered, or power assisted, and linked by single control to prevent jerking during startup and to minimize tension spikes on the cable during respooling.

4.13 To respool a cable:

a) Start the respooler and pay off at a slow speed. Ensure that the cable is snug on the respooler drum and has no gaps. If any corrections need to be made, stop the units and make the corrections.

b) Monitor the tension on the cable while running. Consult Table 3 for guidelines on the maximum tensile load for different cable types.

NOTE: Values in this table are based on one-half the maximum short term tensile load of the various cables designs to allow for a margin of safety.

Cable Type	Maximum Tensile Load (lb _f)
900 µm Buffered Fiber	1,4
Interconnect and Fan-out Tubing	25
OFNR Indoor Distribution < 12 fibers	75
OFNR Indoor Distribution > 24 fibers	150
OFNP Indoor Distribution < 12 fibers	50
OFNP Indoor Distribution > 24 fibers	75
FREEDM® LST < 12 fibers	150
All Other Flame Retardant Loose Tube	300
Outdoor Loose Tube	300
Table 3 Maximum Respooling Tensile Loads for Various Cable Designs.	



CAUTION: Do not respool cable at tension levels higher than specified in Table 3. A high tension or fast take-up speed will result in cable damage.

4.14 Use the respooler counter to locate the general area of the cut. At approximately 100m (328 ft.) before the location of the cut, slow the respooler and visibly observe the cable length markings. When the designated foot/meter mark is reached, stop the respooler.

NOTE: The counter is for reference only. Rely on the length marking printed on the cable. Remember that the counter must be reset after each cut of cable that is run through it.

4.15 Double check the length marks to confirm the length of respooled cable before cutting. Do not cut the cable until you are certain you have respooled the correct length.

Cut the cable and complete the take-up process. When finished, secure the top end of cable to the inside flange that is closer to the cable end, with tie wrap or a staple for wooden reels.

NOTE: To prevent adhesive residue on the cable, do not use duct tape on the cable.

4.16 To maximize efficiency, cut all orders from a given master reel prior to changing the master reel. Remove the reel from the respooler, and if all orders of the cable are complete, also remove the payoff reel.

Appendix A - Minimum Drum Sizes by Measured Cable Outer Diameter (OD)

The table below indicates the minimum drum diameter based on the measured cable diameter.
 $(\text{Cable OD(mm)} \times (30 \div 25.4)) = \text{Reel Drum Diameter (in.)}$

Measured Cable OD (mm)	Minimum Drum Diameter (in)	Measured Cable OD (mm)	Minimum Drum Diameter (in)	Measured Cable OD (mm)	Minimum Drum Diameter (in)
≤7.0		16.0	18.9	25.0	29.5
7.5	8.9	16.5	19.5	25.5	30.1
8.0	9.4	17.0	20.1	26.0	30.7
8.5	10.0	17.5	20.7	26.5	31.3
9.0	10.6	18.0	21.3	27.0	31.9
9.5	11.2	18.5	21.9	27.5	32.5
10.0	11.8	19.0	22.4	28.0	33.1
10.5	12.4	19.5	23.0	28.5	33.7
11.0	13.0	20.0	23.6	29.0	34.3
11.5	13.6	20.5	24.2	29.5	34.8
12.0	14.2	21.0	24.8	30.0	35.4
12.5	14.8	21.5	25.4	30.5	36.0
13.0	15.4	22.0	26.0	31.0	36.6
13.5	15.9	22.5	26.6	31.5	37.2
14.0	16.5	23.0	27.2	32.0	37.8
14.5	17.1	23.5	27.8	32.5	38.4
15.0	17.7	24.0	28.3		
15.5	18.3	24.5	28.9		

NOTES:

- All interconnect cables (e.g., single fiber cable, DIB®, Zipcord, etc.) require an 8.0-inch minimum drum size.
- Using a reel drum size that is smaller than recommended can cause increased attenuation, and permanent cable damage.
- When re-spooling cable, use the cable outer diameter to determine the minimum reel drum diameter.
- If no reel is available of the size listed, use the next larger reel drum that is available.

Appendix B - Respooling Checklist

- ☐ 1. Verify the cable part number and cutting length.
- ☐ 2. Determine the take-up reel size.
 -  **CAUTION:** The drum diameter should be the larger of either 8 inches or 30 times the cable O.D.
- ☐ 3. Load the payoff and take-up reels
- ☐ 4. Set the take-up speed and traverse limits
- ☐ 5. Create the cable tail (typically 10 to 15 feet) and reset the counter.
- ☐ 6. Start the take-up slowly and gradually increase speed.
 -  Monitor respool tension to prevent causing cable damage.
 -  Verify the cable length markings and double check the cut length *before* cutting the cable.
- ☐ 7. Check the cable length and cut the cable.
- ☐ 8. Secure the cable to the reel flange with tie wraps and staples.

Corning Cable Systems LLC • PO Box 489 • Hickory, NC 28603-0489 USA
1-800-743-2671 • FAX +1-828-325-5060 • International +1-828-901-5000 • <http://www.corning.com/cablesystems>

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