FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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Corning FlexNAP™ outside plant system provides the most cost-effective method of deploying optical fiber in outside plant distribution networks at speeds significantly faster than traditional field installations. The FlexNAP system utilizes optical fiber cables upon which network access points are pre-installed at customer-specified locations along the length of the cable. The cable and network access points are tested and shipped as a complete distribution cable/terminal system.

Compatible with both aerial (overlash, dedicated, messenger, and self-support) and below-ground (direct-buried and duct) outside plant distribution applications, Corning FlexNAP system significantly reduces installation time by as much as 50% per network access point.

The increased speed of network deployment, along with the reliability of factory testing, offers significant value to the end user in the following key areas: deployment velocity, risk avoidance, workforce efficiency, capital avoidance, and deferment.

Features and Benefits

Factory-installed, sealed splice points
Drastically reduce field splicing with a predetermined waterproof tether attachment point (TAP)

Flexible preterminated access points
Utilize traditional field-installation techniques for aerial, below-grade, and duct applications

Maximum of one tether per attachment point
Up to 2 fibers at each TAP

Available with ALTOS® loose tube gel-free, ALTOS Figure-8, and ALTOS Lite gel-free armored distribution cable types
Field familiarity with traditional network cable types

Evolv® stubless splitter terminals may be configured with four or eight Pushlok™ connector ports
Allow multiple configuration variations that are suitable for aerial, below-ground, and duct applications
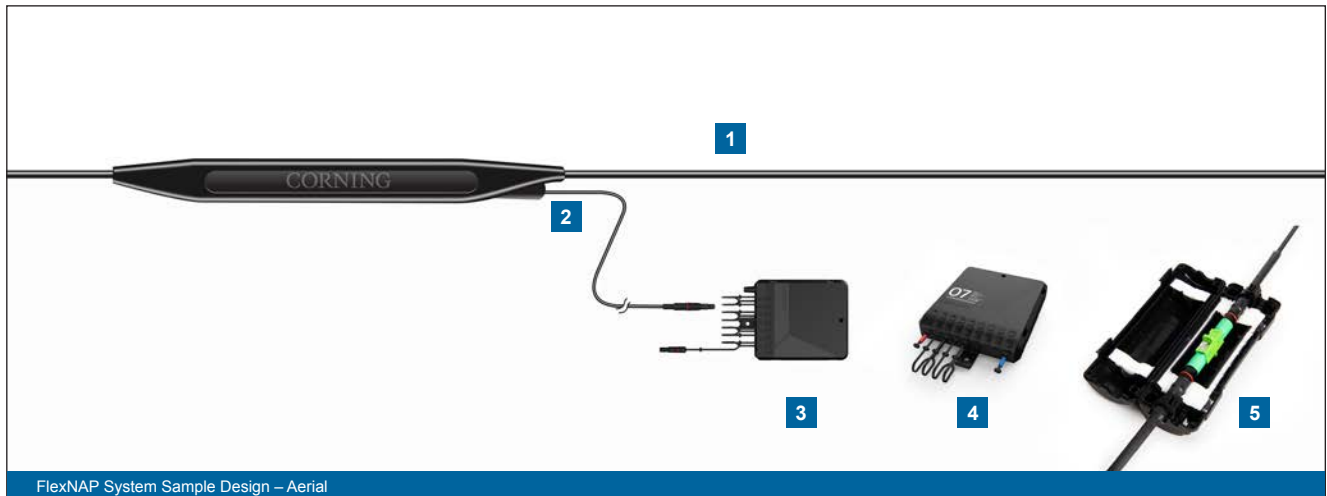
Standards

Design and Test Criteria
GR-3122, GR-771,GR-3120

FlexNAP Single-Fiber Tether System | Photo REN8876-1

FlexNAP Pushlok Connector | Photo CRR5103

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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Sample Design Layouts
Aerial FlexNAP™ System Portfolio

FlexNAP System Sample Design – Aerial

A FlexNAP™ system cable consists of four components:

1. FlexNAP system distribution cable
2. FlexNAP system network access points (with Pushlok™ single-fiber connector)
3. Evolv® Splitter Terminal with Pushlok Technology (Page 7)
4. Evolv Optical Tap Terminal with Pushlok Technology (Page 9)
5. Direct connect to Pushlok drop using Evolv Pushlok Connection Kit (Page 14)

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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Specifications

Temperature Range	
Storage	-40°C to 70°C (-40°F to 158°F)
Installation	-30°C to 70°C (-22°F to 158°F)
Operation	-40°C to 70°C (-40°F to 158°F)

Type	Maximum Distribution Cable Fiber Count	Minimum Duct Size (in)	Maximum Fibers per Access Point	Maximum Tether Assemblies per Access Point	Nominal Overmold Outer Diameter mm (in)	Minimum Bend Radius Loaded cm (in)	Minimum Bend Radius Installed cm (in)	Maximum Tensile Load Short-Term N (lbf)	Maximum Tensile Load Long-Term N (lbf)
FlexNAP™ System – Loose Tube Dielectric									
Low-Profile	≤ 72	1.25	2	1	28 (1.1)	15.8 (6.2)	10.5 (4.1)	2700 (600)	890 (200)
Note: Dual-tether locations will have two individual single-tether access points.									
Standard	≤ 72	2	2	1	36 (1.4)	15.8 (6.2)	10.5 (4.1)	2700 (600)	890 (200)
High-Fiber-Count	96	2	2	1	44 (1.7)	18.3 (7.2)	12.2 (4.8)	2700 (600)	890 (200)
	144	2	2	1	44 (1.7)	23.7 (9.3)	15.8 (6.2)	2700 (600)	890 (200)
	216	2	2	1	44 (1.7)	24.0 (9.4)	16.0 (6.3)	2700 (600)	890 (200)

Type	Maximum Distribution Cable Fiber Count	Minimum Duct Size (in)	Maximum Fibers per Access Point	Maximum Tether Assemblies per Access Point	Nominal Overmold Outer Diameter mm (in)	Minimum Bend Radius Loaded cm (in)	Minimum Bend Radius Installed cm (in)	Maximum Tensile Load Short-Term N (lbf)	Maximum Tensile Load Long-Term N (lbf)
FlexNAP System – Loose Tube Armored									
Standard	≤ 72	2	2	1	44 (1.7)	182 (7.2)	121 (4.8)	2700 (600)	890 (200)
High-Fiber-Count	96	3	2	1	50 (2.0)	207 (8.1)	138 (5.4)	2700 (600)	890 (200)
	144	3	2	1	50 (2.0)	263 (10.4)	175 (6.9)	2700 (600)	890 (200)
	216	3	2	1	50 (2.0)	266 (10.5)	177 (7.0)	2700 (600)	890 (200)

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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Tether Application	Tether Length (ft)	Connector Style	Cable Type	Available Fiber Counts	Insertion Loss (dB) Typical	Reflectance (dB) Typical	Polish
Pushlok™ Single-Fiber Cable Assembly Tether							
Aerial	10	Pushlok Single-fiber	ROC™ drop	1 or 2	0.15	≤ -65	8° angle
Below Ground/Duct	15	Pushlok Single-fiber	ROC drop	1 or 2	0.15	≤ -65	8° angle

Ordering Process

Ordering the FlexNAP system is a three-step process:

1. Design and Measure – Design the distribution cable build-plan and measure distances between poles, handholes, or pedestals to fit your specific application.
2. Create and Submit Build-Plan Online – Contact Corning at 800-743-2675 for access to the online configurator.
3. Place Order – Place order by submitting the single, unique part number generated by the online configurator.
   Note: Initial FlexNAP system quote will be generated using this specification sheet to create a component bill of materials (BOM).

**Component Specifications**

The FlexNAP system configurator is an online tool used to format a build-plan that will be used to process the FlexNAP system design specifications at Corning. The following information is provided to illustrate the available FlexNAP system configurations and to allow for creating a bill of materials (BOM) for planning purposes once a design is uploaded. The BOM created is only for reference and is not a component breakdown for ordering. A single part number used for ordering will be generated by the FlexNAP system configurator that will encompass the components of the BOM.

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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Ordering Information

Distribution Trunk Cables

FNAP - CBL - ▢▢▢ E ▢▢
                               1   **2**   **3**
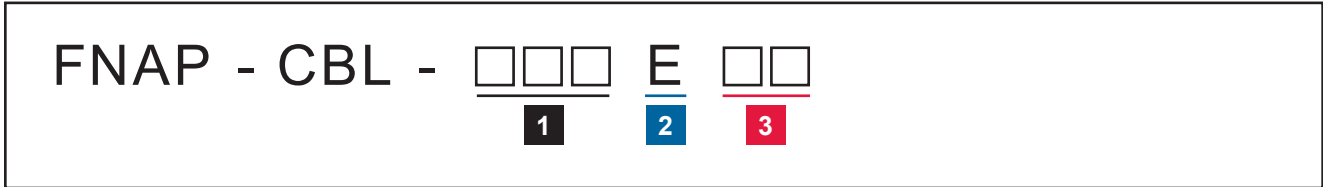
1 **Select fiber count.**
012 = 12 fibers	096 = 96 fibers
024 = 24 fibers	144 = 144 fibers
036 = 36 fibers	216 = 216 fibers
048 = 48 fibers	
060 = 60 fibers	
072 = 72 fibers	

See Note 1

2 **Defines fiber type.**
E = Single-mode (OS2)

3 **Select cable type.**
U4 = ALTOS® loose tube gel-free
UA = Figure-8 loose tube
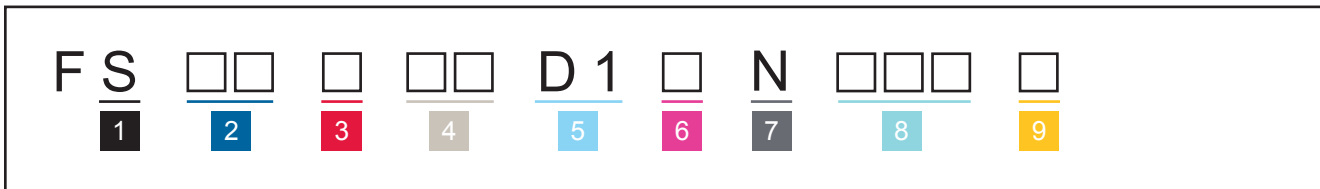UC = ALTOS Lite gel-free armored

1) 216 fiber only in ALTOS All-Dielectric Cable and ALTOS Lite Gel-Free Armored Cable.

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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Ordering Information

Tether Attachment Points

```
F S  ☐☐  ☐  ☐☐  D 1  ☐  N  ☐☐☐  ☐
  1    2   3   4    5   6  7    8    9
```

1 Defines fiber type.
S = Single-mode (OS2)

2 Select cable type
D4 = ALTOS® loose tube
      gel-free cable
D8 = Figure-8 loose tube cable
DC = ALTOS Lite gel-free
      armored cable

3 Select TAP type.
A = Standard cable type closure
C = Low-profile cable type closure*

** Selection is only available on 72 fiber
and below dielectric cable. Also
applies to ALTOS dielectric cable.*

**4 Select fiber count
(single or dual tether).**
01 = 1 x 1 fiber tether
02 = 2 x 1 fiber tether

5 Defines connector type.
D1 = Pushlok™ connector
      (single fiber)

**6 Select installation
environment.**
T = Aerial
R = Below grade

7 Defines end cap type.
N = No loop back

8 Select tether length.
010 = Longest tether is 10 ft (3 m)
015 = Longest tether is 15 ft (4 m)

**9 Select unit of measure
for tether length.**
F = Feet
M = Meters

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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Evolv® Splitter Terminal with Pushlok™ Technology

Evolv Splitter Terminal with Pushlok Technology 8-post (1x8)

Evolv Splitter Terminal with Pushlok Technology 4-post (1x4)
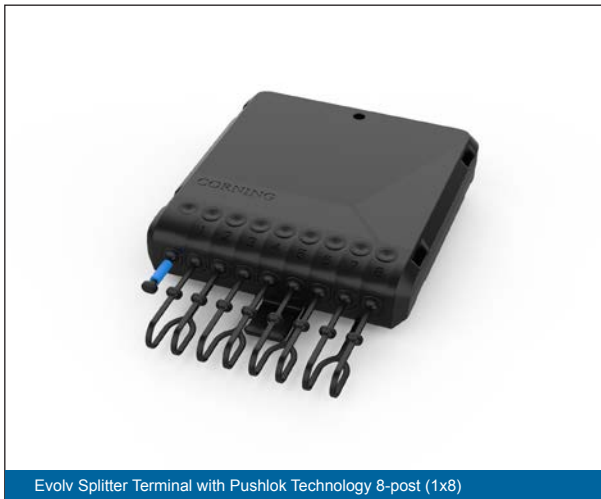
Mechanical Characteristics

	Dimensions (L x W x H)	Weight
Evolv 1x4 Splitter Terminal	**154 mm x 84 mm x 30 mm** **(6.06 in x 3.29 in x 1.18 in)**	**0.195 kg** **(0.43 lb)**
Evolv 1x6 Splitter Terminal	**154 mm x 134 mm x 30 mm** **(6.06 in x 5.29 in x 1.18 in)**	**0.390 kg** **(0.86 lb)**

Optical Characteristics

	Insertion Loss Max.	Reflectance
Evolv 1x4 Splitter Terminal	**8.0 dB**	**> 55 dB**
Evolv 1x6 Splitter Terminal	**11.4 dB**	**> 55 dB**

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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Evolv® Terminals, Splitter

Ordering Information	
DSH2F100D1NC000S0P	Evolv® Splitter Terminal with Pushlok™ Technology, 2 port, unstubbed, 1x2 splitter
DSH4F100D1NC000S0P	Evolv Splitter Terminal with Pushlok Technology, 4 port, unstubbed, 1x4 splitter
DSF8F100D1NC000S0P	Evolv Splitter Terminal with Pushlok Technology, 8 port, unstubbed, 1x8 splitter
DSF9F100D1NC000S0P	Evolv Splitter Terminal with Pushlok Technology, 8 port, unstubbed, 1x8 splitter, 2 rows of 4 ports
DSP6F100D1NC000S0P	Evolv Splitter Terminal with Pushlok Technology, 16 port, unstubbed, 1x16 splitter, 2 rows of 8 ports

```
D S ☐☐ F 1 0 0 D 1 N C 0 0 0 S 0 P
      1    2       3   4
```

1 Select number of Pushlok™ single-fiber connector ports.
H2 = 2 ports   F9 = 8 ports (2 rows of 4 ports)
H4 = 4 ports   P6 = 16 ports (2 rows of 8 ports)
F8 = 8 ports

2 Defines connector type.
F1 = Single-fiber per port

3 Defines port connector type.
D1 = Single-fiber Pushlok SC APC

4 Defines tail connector type.
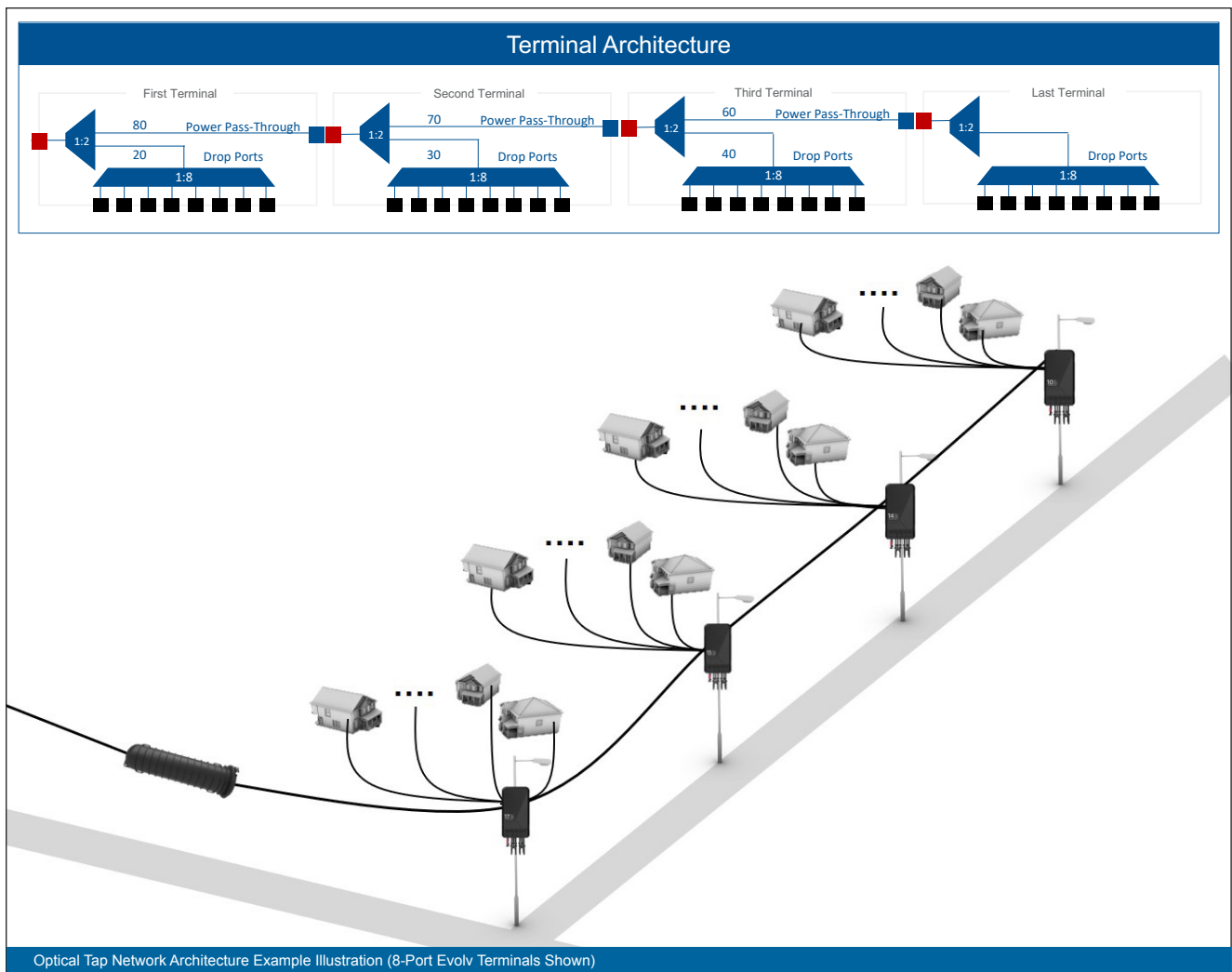NC = Not connectorized

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

Evolv® Optical Tap Terminals with Pushlok™ Technology

The optical distributed tap architecture leverages a cascaded network of uneven-split, or asymmetric split, multiport terminals to ensure sufficient signal reaches subscribers along the route. As the first terminal is closest to the signal source (OLT), a lower amount of signal is needed to feed the subscribers served from the 1x2, 1x4, or 1x8 splitter.

In many cases, the first multiport terminal will utilize a 90/10 power split where the 10% feeds the subscriber ports and the 90% passes on to feed subsequent terminals downstream. Subsequent terminals in the chain either maintain a similar uneven-split ratio or a higher ratio of local power depending upon the distances between terminals and the total link budget. In higher density environments with short distances between terminals, operators may serve more than the standard 32 or 64 subscribers. However, in low-density rural runs spanning long distances, operators may serve fewer subscribers per route as this is heavily dependent upon the link budget.

Optical Tap Network Architecture Example Illustration (8-Port Evolv Terminals Shown)

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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Evolv® Optical Tap Terminals with Pushlok™ Technology

Mechanical Specifications	
Application	Aerial, duct, direct-buried
Dimensions (L x W x H)	2-Port Evolv® Terminal: 15.4 x 8.4 x 3.0 cm (6.06 x 3.29 x 1.18 in) 4-Port Evolv Terminal: 15.4 x 13.4 x 3.0 cm (6.06 x 5.29 x 1.18 in) 8-Port Evolv Terminal: 15.4 x 8.4 x 5.8 cm (6.06 x 3.29 x 2.30 in)
Weight	2-Port Evolv Terminal: 0.195 kg (0.43 lb) 4-Port Evolv Terminal: 0.390 kg (0.86 lb) 8-Port Evolv Terminal: 0.400 kg (0.88 lb)
Packaging	Individual packaging
Axial Pull, Plug to Adapter	50 lbs
Axial Pull, Plug to Cable	100 lbs in axial pull with load applied to the dust cap
Cold Mate/Demate	-20°C mechanical testing

2-Port Evolv Terminal Optical Specifications			
Splitter Type	Insertion Loss, Max	Insertion Loss, Typical	Reflectance, Typical
Pass-Through Port (90)	1.20 dB	1.00 dB	-55 dB
Drop Port (10)	15.40 dB	14.50 dB	-55 dB
Pass-Through Port (85)	1.50 dB	1.20 dB	-55 dB
Drop Port (15)	13.20 dB	12.60 dB	-55 dB
Pass-Through Port (80)	1.80 dB	1.40 dB	-55 dB
Drop Port (20)	11.80 dB	11.20 dB	-55 dB
Pass-Through Port (70)	2.40 dB	2.00 dB	-55 dB
Drop Port (30)	10.00 dB	9.40 dB	-55 dB
Pass-Through Port (60)	3.10 dB	2.80 dB	-55 dB
Drop Port (40)	8.70 dB	8.00 dB	-55 dB

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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Evolv® Optical Tap Terminals with Pushlok™ Technology

4-Port Evolv Terminal Optical Specifications

Splitter Type	Insertion Loss, Max	Insertion Loss, Typical	Reflectance, Typical
Pass-Through Port (90)	1.20 dB	1.00 dB	-55 dB
Drop Port (10)	19.30 dB	17.20 dB	-55 dB
Pass-Through Port (85)	1.50 dB	1.20 dB	-55 dB
Drop Port (15)	17.00 dB	15.50 dB	-55 dB
Pass-Through Port (80)	1.80 dB	1.40 dB	-55 dB
Drop Port (20)	16.00 dB	14.50 dB	-55 dB
Pass-Through Port (70)	2.40 dB	2.00 dB	-55 dB
Drop Port (30)	13.60 dB	12.20 dB	-55 dB
Pass-Through Port (60)	3.10 dB	2.80 dB	-55 dB
Drop Port (40)	12.30 dB	11.00 dB	-55 dB

8-Port Multiport Optical Specifications

Splitter Type	Insertion Loss, Max	Insertion Loss, Typical	Reflectance, Typical
Pass-Through Port (90)	1.20 dB	1.00 dB	-55 dB
Drop Port (10)	21.74 dB	20.42 dB	-55 dB
Pass-Through Port (85)	1.50 dB	1.20 dB	-55 dB
Drop Port (15)	20.98 dB	18.60 dB	-55 dB
Pass-Through Port (80)	1.80 dB	1.40 dB	-55 dB
Drop Port (20)	18.45 dB	17.50 dB	-55 dB
Pass-Through Port (70)	2.40 dB	2.00 dB	-55 dB
Drop Port (30)	16.71 dB	15.40 dB	-55 dB
Pass-Through Port (60)	3.10 dB	2.80 dB	-55 dB
Drop Port (40)	15.52 dB	14.20 dB	-55 dB

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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Evolv® Optical Tap Terminals with Pushlok™ Technology

Environmental Characteristics	
Characteristics Temperature Rating	-40°C to 85°C (-40°F to 185°F)
RoHS	Free of hazardous substances according to RoHS 2011/65/EU

Standards	
Telcordia	Designed to Telcordia GR-771-CORE, Issue 1

Product Design	
Red Connector Port	Input Connector Port
Blue Connector Port	Cascade/Next Hop Connector Port

Optical Tap Evolv® Terminal Family (8-Port Evolv Terminals Shown)

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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Ordering Information

Evolv® Optical Tap Terminal

```
D T □□□□ □□ 0 0 N C 0 0 S 0 □
      1      2              3
```

1 **Define number of terminal ports.**
A4X2 = 4-port terminal,
2 subscribers
A8X4 = 8-port terminal,
4 subscribers
B4X8 = 8-port terminal,
8 subscribers

2 **Defines connector type.**
2 Subscriber Port Terminals
15 = 90/10 Power Split
13 = 85/15 Power Split
11 = 80/20 Power Split
09 = 70/30 Power Split
08 = 60/40 Power Split
04 = 00/00 Power Split

4 Subscriber Port Terminals
17 = 90/10 Power Split
16 = 85/15 Power Split
15 = 80/20 Power Split
12 = 70/30 Power Split
11 = 60/40 Power Split
07 = 00/00 Power Split

8 Subscriber Port Terminals
20 = 90/10 Power Split
18 = 85/15 Power Split
17 = 80/20 Power Split
15 = 70/30 Power Split
14 = 60/40 Power Split
10 = 00/00 Power Split

3 **Select packaging.**
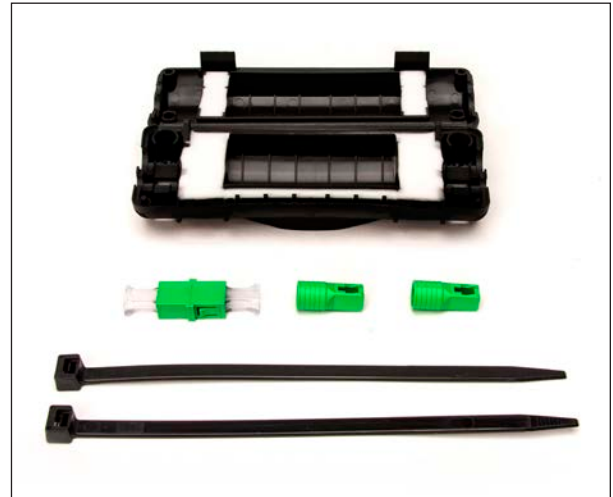P = Standard spool — individual
packaging
B = Bulk packaging

Part Number Examples

Part Number	Product Description	Units per Delivery
DTA4X21500NC000S0P	Optical Tap Evolv Terminal, 90/10 power distribution, 2 port, stubless	1
DTA8X41700NC000S0P	Optical Tap Evolv Terminal, 90/10 power distribution, 4 port, stubless	1
DTB4X82000NC000S0P	Optical Tap Evolv Terminal, 90/10 power distribution, 8 port, stubless	1

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

Evolv® 1-Fiber Pushlok™ Connection Kit

Accessory Information	
Evolv® 1-Fiber Pushlok™ Connection Kit	
Part Number	**OSLC-Pushlok-Adapter**
Description	**The 1-fiber to 1-fiber Pushlok Adapter contains an OSLC mini-splice repair closure, 2 SC APC converters (KT-PL-SHROUD-SC), and 1 SC APC to SC APC adapter. This allows users to connect 2 Pushlok drop cable 1-fiber assemblies together. This may be used in instances where a drop cable assembly is too short to reach a final destination and needs to be extended.**

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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Evolv® Port Cleaner with Pushlok™ Technology

Accessory Information	
Evolv® Port Cleaner with Pushlok™ Technology	
Part Number	**CLEANER-PUSHLOK**
Description	The Evolv Port Cleaner with Pushlok Technology is compatible with both Pushlok and OptiTap® connectors and Evolv terminals and multiports. Single-fiber port cleaner accessories are proven effective for removing the following from connector end faces: skin oil, hand lotion, Arizona road dust, pre- and post-mate graphite, salt, isopropyl alcohol residue, and distilled water residue. These cleaners are easy to use and offer over 525 cleanings.
Standards	Free of hazardous substances according to RoHs 2011/65/EU

FlexNAP™ Single-Fiber Tether Distribution System with Pushlok™ Connectors

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