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# An Installation Pocket Reference Guide

Anixter is a leading global supplier of communications and security products, electrical and electronic wire and cable, fasteners and other small components. We help our customers specify solutions and make informed purchasing decisions around technology, applications and relevant standards. Throughout the world, we provide innovative supply chain management services to reduce our customers' total cost of production and implementation.

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## INTRODUCTION



### Anixter: The Cabling System Experts

Anixter's technological expertise extends beyond product knowledge into every phase of deployment. With more than 100 RCDDs and a dedicated Infrastructure Solutions Lab that evaluates the latest structured cabling, access control and video surveillance solutions, Anixter not only has industry-leading technical expertise, but also provides the best practices for installing and calibrating solutions that provide optimal performance in a variety of environments. We also bundle our products with our innovative Supply Chain Solutions to cut costs out of our customers' business processes.

Whether it is a data, voice or video network, wired or wireless, in an office, campus or data center, Anixter is the one distributor with both the technical expertise and industry knowledge to help customers determine the right product for any application. Our unparalleled global distribution capabilities ensure that you get the right product, when and where you need it.

We have pulled together some valuable information for you in this easy-to-use pocket guide that covers the key aspects of twisted-pair, coaxial and fiber cable and connectors and their related installation standards and practices.

If you would like more information, please contact your local Anixter representative at 1.800.ANIXTER.



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## SECTION 1: STANDARDS REFERENCE DOCUMENTS

### Standards Reference Documents

Table 1.1 Standards Reference Documents

Telecommunications standards provide recommended best practices for the design and installation of cabling systems to support a wide variety of existing and future systems to extend the life span of the telecommunications infrastructure.

Standard	Description
ANSI/TIA-568-C.0	Generic Telecommunications Cabling for Customer Premises
ANSI/TIA-568-C.1	Commercial Building Telecommunications Cabling Standard
ANSI/TIA-568-C.2	Balanced Twisted Pair Telecommunications Cabling and Components Standard
ANSI/TIA-568-C.3	Optical Fiber Cabling Components
ANSI/TIA-569-B	Commercial Building Standard for Telecommunications Pathways and Spaces
ANSI/TIA-606-A	Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
J-STD-607-A	This standard specifies uniform telecommunications grounding and bonding infrastructures that should be followed within commercial buildings.
ANSI/TIA-942	Telecommunications Infrastructure Standard for Data Centers
IEEE 802.3af	This standard specifies data terminal equipment (DTE) power via media dependent interface (MDI). The specification calls for power source equipment that operates at 48 volts of direct current for 12.95 watts of power over unshielded twisted-pair cable to data terminal equipment 100 meters away.

Continued on next page >>



Standard	Description
IEEE 802.3an	This standard specifies physical layer and management parameters for 10 Gbps operation, type 10GBASE-T and 10 Gigabit Ethernet over twisted-pair cabling.
IEEE 802.3at	<p>This amendment to the 802.3af standard offers improved power-management features. Increased power to end devices and new possibilities of powering devices through standard Category 5e, 6 and 6A cabling.</p> <p>The new IEEE 802.3at Power over Ethernet Plus standard increases the current, voltage and wattage available over balanced 100-ohm twisted-pair cabling systems. The standard defines the technology for powering a wide range of powered devices up to 25 watts over existing Category 5e and above cables. The 802.3at standard states that 30 watts at a minimum are allocated at the port, so 24.6 watts are ensured at the end device connector 100 meters away.</p>
IEEE 802.11	<p>This standard specifies wireless LAN Access Control (MAC) and physical layer (PHY) specifications.</p> <p>The standard denotes a set of wireless LAN/WLAN specifications developed by working group 11 of the IEEE LAN/MAN standards committee (IEEE 802).</p>
IEEE 802.3ba	This standard defines Media Access Control (MAC) parameters, physical layer specifications and management parameters for the transfer of 802.3 frames at 40 Gbps and 100 Gbps. The amendment facilitates the migration of 10 GB Ethernet from the network core to the edge by providing 40 Gbps and 100 Gbps data rates for backbone and backhaul applications to remove bandwidth bottlenecks that exists in many corporate networks today.

## Abbreviation References

Table 1.2 Abbreviation References

Abbreviation	Reference
ANSI	American National Standards Institute
ASTM	American Society for Testing and Materials
CSA	Canadian Standards Association
IEC	International Electrotechnical Commission
IEEE	Institute of Electrical & Electronics Engineers
ISO	International Organization for Standardization
NEC	National Electrical Code
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
TIA	Telecommunications Industry Association

## Obtaining Standards Documents

TIA documents may be purchased through Global Engineering Documents at 1.800.854.7179 or [global.ihs.com](http://global.ihs.com). IEEE documents may be purchased through IEEE, P.O. Box 1331, Piscataway, NJ 08855 or [iee.org](http://iee.org). CSA documents may be purchased through the Canadian Standards Association at [csa.ca](http://csa.ca) or by calling 1.416.747.4000.

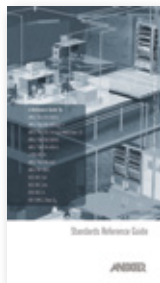
For further assistance or more information, contact your local Anixter sales office or 1.800.ANIXTER. Some material in this publication is reproduced from standards publications, which are copyrighted by the Telecommunications Industry Association.

This handbook was prepared by Anixter Inc., which is not affiliated with the Telecommunications Industry Association or the Electronic Industries Alliance. TIA is not responsible for the content of this publication.

For direct assistance in interpreting telecommunications standards, consider contacting a Registered Communications Distribution Designer (RCDD) certified by the Building Industry Consulting Service International (BICSI) at 1.800.242.7405 or [bicsi.org](http://bicsi.org).

## Additional Resources

Anixter provides a wide variety of resources, including our Standards Reference Guides. These documents below highlight the key points of industry standards to improve availability and reduce expenses by defining cabling types, distances, connections, system architectures, termination standards, performance characteristics, and installation and testing methods.



**Standards  
Reference Guide**



**Standards Reference Guide**  
Telecommunications  
Infrastructure for  
Industrial Premises

For additional information, visit the Technical Resources page of [anixter.com](http://anixter.com). Anixter also has a collection of catalogs that provide you with the right products for your specific applications. These include the Electrical and Electronic Wire & Cable Products catalog, the Wire and Cable Technical Information Handbook, the Communications Products catalog and the Security Solutions catalog. Contact your local Anixter sales representative, call 1.800.ANIXTER or go to [anixter.com/literature](http://anixter.com/literature) for more information.

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## SECTION 2: BUILDING SUBSYSTEMS

## The Six Subsystems of a Structured Cabling System

**Note:** This portion of the reference guide is based on two new standards titled ANSI/TIA-568-C.0 (Generic Telecommunications Cabling for Customer Premises), which is used for generic infrastructures, and ANSI/TIA-568-C.1 (Commercial Building Telecommunications Cabling Standard [see p. 6]), which is more commonly used with typical commercial building infrastructures. These two standards are fully consistent with each other regarding the telecommunications infrastructure topology. However, they occasionally use different terms for the same system components. In this reference guide when different terms exist between the two standards for the same component, the more common 568-C.1 version will be used first, followed by the 568-C.0 (generic version) in square parentheses. Example: work area (WA) [equipment outlet (EO)].

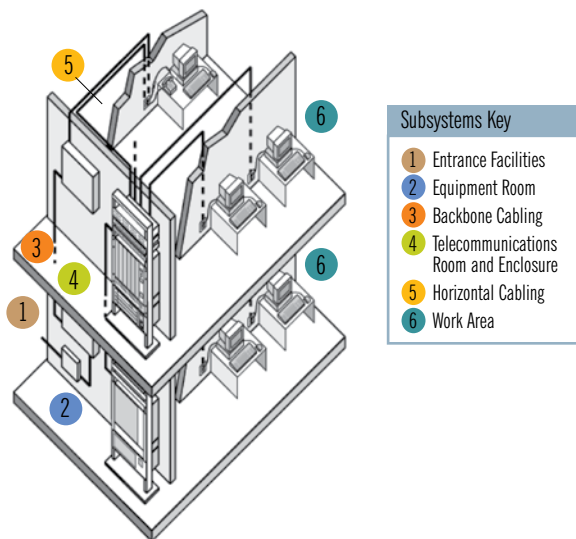


Figure 2.1 — Six Subsystems of Structured Cabling System

**1. Entrance Facilities (EF)** Entrance facilities contain the cables, network demarcation point(s), connecting hardware, protection devices and other equipment that connect to the access provider (AP) or private network cabling. It includes connections between outside plant and inside building cabling.

**2. Equipment Room (ER)** The environmentally controlled centralized space for telecommunications equipment is usually more complex than a telecommunications room (TR) or telecommunications enclosure (TE). It usually houses the main cross-connect (MC) [Distributor C] and may also contain the intermediate cross-connects (ICs) [Distributor B], horizontal cross-connects (HCs) [Distributor A], or both.

**3. Backbone Cabling** The backbone cabling provides interconnection between telecommunications rooms, equipment rooms, access provider (AP) spaces and entrance facilities. There are two subsystems defined for backbone cabling:

- Cabling Subsystem 2 — Backbone cabling between the horizontal cross-connect (HC) [Distributor A (DA)] and the intermediate cross-connect (IC) [Distributor B (DB)]
- Cabling Subsystem 3 — Backbone cabling between an intermediate cross-connect (IC) [Distributor B (DB)] and the main cross-connect (MC) [Distributor C (DC)]

Recognized cabling:

- 100-ohm twisted-pair cabling: Category 3, Category 5e, Category 6 or Category 6A
- Multimode optical fiber cabling: 850 nm laser-optimized 50/125  $\mu\text{m}$  is recommended; 62.5/125  $\mu\text{m}$  and 50/125  $\mu\text{m}$  is allowed
- Single-mode optical fiber cabling

(See [Tables 2.2 and 2.3](#) on the following pages for maximum supportable distances for copper and fiber backbones.)

#### **4. Telecommunications Room (TR) and Telecommunications Enclosure (TE)**

A TR or TE houses the terminations of horizontal and backbone cables to connecting hardware including any jumpers or patch cords. It may also contain the IC or MC for different portions of the backbone cabling system. The TR or TE also provides a controlled environment to house telecommunications equipment, connecting hardware and splice closures serving a portion of the building.

The use of a telecommunications enclosure (TE) is for a specific implementation and not a general case. It is intended to serve a smaller floor area than a TR and may be used in addition to the minimum "one TR per floor" rule.

**5. Horizontal Cabling — (Cabling Subsystem 1)** The horizontal cabling system extends from the work area's telecommunications information outlet to the telecommunications room (TR) or telecommunications enclosure (TE). It includes horizontal cable, mechanical terminations, jumpers and patch cords located in

the TR or TE and may incorporate multiuser telecommunications outlet assemblies (MUTOAs) and consolidation points (CPs). The maximum horizontal cable length shall be 90 m (295 ft.), independent of media type. If a MUTOA is deployed, the maximum horizontal balanced twisted-pair copper cable length shall be reduced in accordance with [Table 2.4](#).

Recognized cabling:

- 4-pair 100-ohm unshielded or shielded twisted-pair cabling: Category 5e, Category 6 or Category 6A
- Multimode optical fiber cabling, 2-fiber (or higher fiber count)
- Single-mode optical fiber cabling, 2-fiber (or higher fiber count)

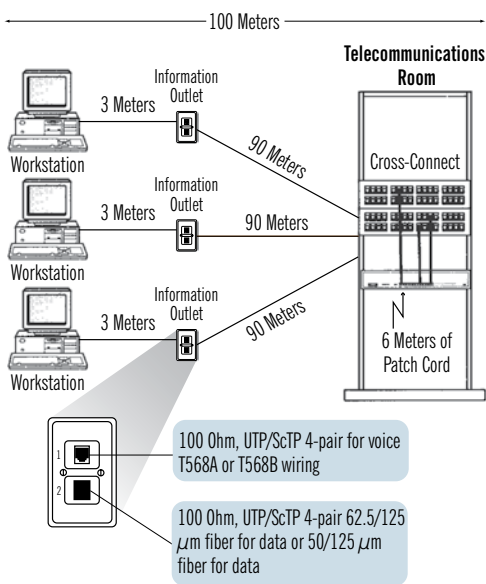


Figure 2.2 – Horizontal Cable Maximum Distances and Information Outlets

**6. Work Area** Work area (WA) components extend from the telecommunications outlet/connector end of the horizontal cabling system to the WA equipment. A minimum of two telecommunications outlets (permanent links) should be provided for each work area. Multiuser telecommunications outlet assemblies (MUTOAs), if used, are part of the WA.

(See [Table 2.4](#) for the maximum length of horizontal cables and work area cords.)



Table 2.1 – Work Area Components

Equipment	Components
Station equipment	Computers, data terminals, telephones, etc.
Patch cables	Modular cords, PC adapter cables, fiber jumpers, etc.
Adapters	Converters, baluns, etc. (Must be external to telecommunications outlet)

### Maximum Cabling Distances

Table 2.2 – Cabling Distances for Horizontal and Backbone Cabling and Work Area Cord

Maximum supportable distances for balanced twisted-pair cabling by application. Includes horizontal and backbone cabling (application specific).

Application	Media	Distance m (ft.)	Comments
Ethernet 10BASE-T	Category 3, 5e, 6, 6A	100 (328)	
Ethernet 100BASE-TX	Category 5e, 6, 6A	100 (328)	
Ethernet 1000BASE-T	Category 5e, 6, 6A	100 (328)	
Ethernet 10GBASE-T	Category 6A	100 (328)	
ADSL	Category 3, 5e, 6, 6A	5,000 (16,404)	1.5 Mbps to 9 Mbps
VDSL	Category 3, 5e, 6, 6A	5,000 (16,404)	1,500 m (4,900 ft.) for 12.9 Mbps, 300 m (1,000 ft.) for 52.8 Mbps
Analog phone	Category 3, 5e, 6, 6A	800 (2,625)	
Fax	Category 3, 5e, 6, 6A	5,000 (16,404)	
ATM 25.6	Category 3, 5e, 6, 6A	100 (328)	
ATM 51.84	Category 3, 5e, 6, 6A	100 (328)	
ATM 155.52	Category 5e, 6, 6A	100 (328)	
ATM 1.2G	Category 6, 6A	100 (328)	
ISDN BRI	Category 3, 5e, 6, 6A	5,000 (16,404)	128 kbps
ISDN PRI	Category 3, 5e, 6, 6A	5,000 (16,404)	1.472 Mbps

Table 2.3 — Maximum Supportable Distances and Attenuation for Optical Fiber Applications

		Multimode						Single-mode	
		62.5/125 $\mu\text{m}$ TIA 492AAAA (OM1)		50/125 $\mu\text{m}$ TIA 492AAAB (OM2)		850 nm laser- optimized 50/125 $\mu\text{m}$ TIA AAAC (OM3)		TIA 492CAAA (OS1)	TIA 492CAAB (OS2)
Application	Parameter Nominal Wavelength (nm)	850	1,300	850	1,300	850	1,300	1,310	1,550
Ethernet 10/100BASE-SX	Channel attenuation (dB)	4.0	-	4.0	-	4.0	-	-	-
	Supportable distance m (ft.)	300 (984)	-	300 (984)	-	300 (984)	-	-	-
Ethernet 100BASE-FX	Channel attenuation (dB)	-	11.0	-	6.0	-	6.0	-	-
	Supportable distance m (ft.)	-	2,000 (6,560)	-	2,000 (6,560)	-	2,000 (6,560)	-	-
Ethernet 1000BASE-SX	Channel attenuation (dB)	2.6	-	3.6	-	4.5	-	-	-
	Supportable distance m (ft.)	275 (900)	-	550 (1,804)	-	800 (2,625)	-	-	-
Ethernet 1000BASE-LX	Channel attenuation (dB)	-	2.3	-	2.3	-	2.3	4.5	-
	Supportable distance m (ft.)	-	550 (1,804)	-	550 (1,804)	-	550 (1,804)	5,000	-
Ethernet 10GBASE-S	Channel attenuation (dB)	2.4	-	2.3	-	2.6	-	-	-
	Supportable distance m (ft.)	33 (108)	-	82 (269)	-	300 (984)	-	-	-
Ethernet 10GBASE-LX4	Channel attenuation (dB)	-	2.5	-	2.0	-	2.0	6.3	-
	Supportable distance m (ft.)	-	300 (984)	-	300 (984)	-	300 (984)	10,000 (32,810)	-
Ethernet 10GBASE-L	Channel attenuation (dB)	-	-	-	-	-	-	6.2	-
	Supportable distance m (ft.)	-	-	-	-	-	-	10,000 (32,810)	-
Ethernet 10GBASE-LRM	Channel attenuation (dB)	-	1.9	-	1.9	-	1.9	-	-
	Supportable distance m (ft.)	-	220 (720)	-	220 (720)	-	220 (720)	-	-
Fibre Channel 100-MX-SN-I (1062 Mbaud)	Channel attenuation (dB)	3.0	-	3.9	-	4.6	-	-	-
	Supportable distance m (ft.)	300 (984)	-	500 (1,640)	-	860 (2,822)	-	-	-

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Table 2.3 — Maximum Supportable Distances and Attenuation for Optical Fiber Applications (continued)

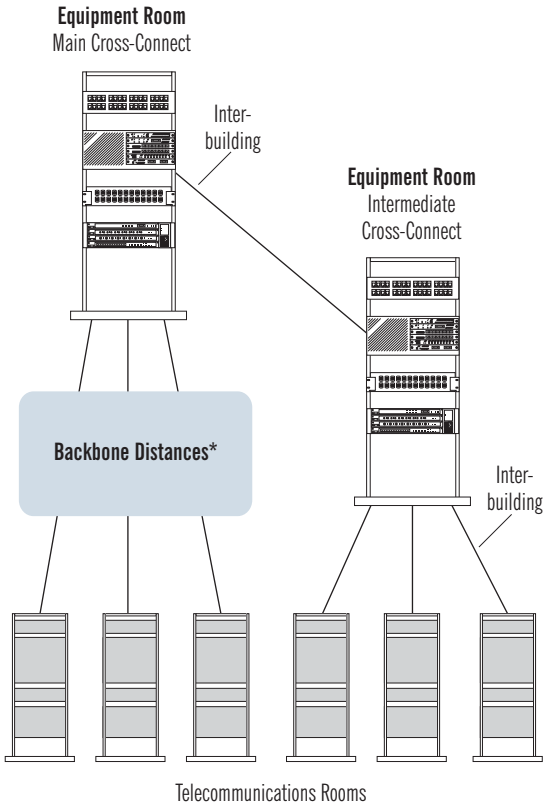
		Multimode						Single-mode	
		62.5/125 $\mu\text{m}$ TIA 492AAAA (OM1)		50/125 $\mu\text{m}$ TIA 492AAAB (OM2)		850 nm laser- optimized 50/125 $\mu\text{m}$ TIA AAAC (OM3)		TIA 492CAA (OS1) TIA 492CAAB (OS2)	
Application	Parameter Nominal Wavelength (nm)	850	1,300	850	1,300	850	1,300	1,310	1,550
Fibre Channel 200-SM-MX- SN-I (2125 Mbaud)	Channel attenuation (dB)	2.1	-	2.6	-	3.3	-	-	-
	Supportable distance m (ft.)	150 (492)	-	300 (984)	-	500 (1,640)	-	-	-
Fibre Channel 200-SM-LC-L (2125 Mbaud)	Channel attenuation (dB)	-	-	-	-	-	-	7.8	-
	Supportable distance m (ft.)	-	-	-	-	-	-	10,000 (32,810)	-
Fibre Channel 400-MX-SN-I (4250 Mbaud)	Channel attenuation (dB)	1.8	-	2.1	-	2.5	-	-	-
	Supportable distance m (ft.)	70 (230)	-	150 (492)	-	270 (886)	-	-	-
Fibre Channel 400-SM-LC-L (4250 Mbaud)	Channel attenuation (dB)	-	-	-	-	-	-	7.8	-
	Supportable distance m (ft.)	-	-	-	-	-	-	10,000 (32,810)	-
Fibre Channel 1200-SM-MX- SN-I (10512 Mbaud)	Channel attenuation (dB)	2.4	-	2.2	-	2.6	-	-	-
	Supportable distance m (ft.)	33 (108)	-	82 (269)	-	300 (984)	-	-	-
Fibre Channel 1200-SM-LL-L (10512 Mbaud)	Channel attenuation (dB)	-	-	-	-	-	-	6.0	-
	Supportable distance m (ft.)	-	-	-	-	-	-	10,000 (32,810)	-
FDDI PMD ANSI X3.166	Channel attenuation (dB)	-	11.0	-	6.0	-	6.0	-	-
	Supportable distance m (ft.)	-	2,000 (6,560)	-	2,000 (6,560)	-	2,000 (6,560)	-	-
FDDI SMF-PMD ANSI X3.184	Channel attenuation (dB)	-	-	-	-	-	-	10.0	-
	Supportable distance m (ft.)	-	-	-	-	-	-	10,000 (32,810)	-

Table 2.4 – Maximum Length of Horizontal Cable and Work Area Cords

	24 AWG Cords		26 AWG Cords	
Length of Horizontal Cable m (ft.)	Max. Length of Work Area Cord m (ft.)	Max. Combined Length of Work Area Cord, Patch Cords and Equipment Cord m (ft.)	Max. Length of Work Area Cord m (ft.)	Max. Combined Length of Work Area Cord, Patch Cords and Equipment Cord m (ft.)
90 (295)	5 (16)	10 (33)	4 (13)	8 (26)
85 (279)	9 (30)	14 (46)	7 (23)	11 (35)
80 (262)	13 (44)	18 (59)	11 (35)	15 (49)
75 (246)	17 (57)	22 (72)	14 (46)	18 (59)
70 (230)	22 (72)	27 (89)	17 (56)	21 (70)

## Star Wiring

Cabling shall be installed in a hierarchal star topology. There shall be no more than two cross-connects [Distributors] between the main cross-connect (MC) [Distributor C] and the work area (WA) [equipment outlet — EO].



**Figure 2.3 – Star Topology Diagram**

**\* Note:** Please refer to [Tables 2.2 and 2.3](#) (on previous pages) for maximum distances based on media type and application.

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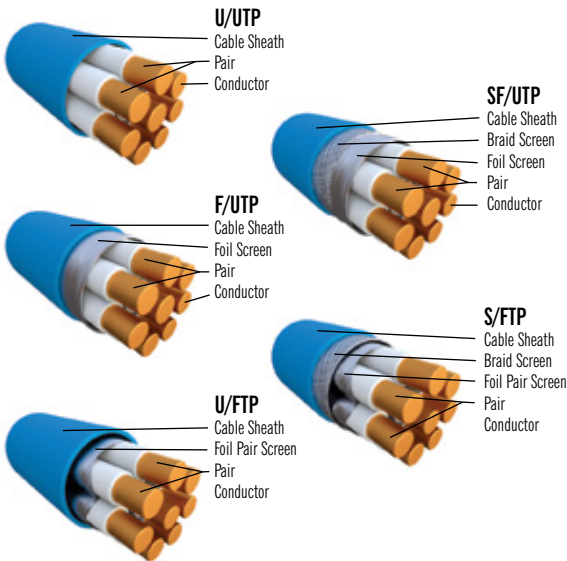
SECTION 3: TWISTED-PAIR CABLE

Twisted-Pair Cable

Twisted-pair cable consists of two insulated copper wires twisted around each other with neighboring pairs in a bundle typically having different twist lengths, between 5 and 15 cm, to reduce crosstalk or electromagnetic induction.

The conductor insulation and overall jacketing of the cable can utilize various shielded or unshielded elements. The ISO/IEC 11801 cable designations are noted in the following figures.

8-conductor/4-pair twisted-pair cable is generally used in horizontal applications from telecommunication closets to a workstation or desk. A multipair twisted-pair cable is generally used in intra- or inter-building backbones.



Guide to understand twisted-pair cabling types abbreviations

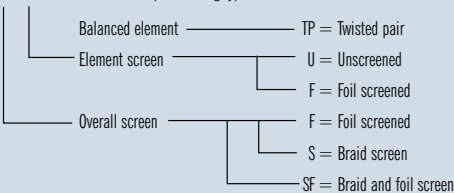


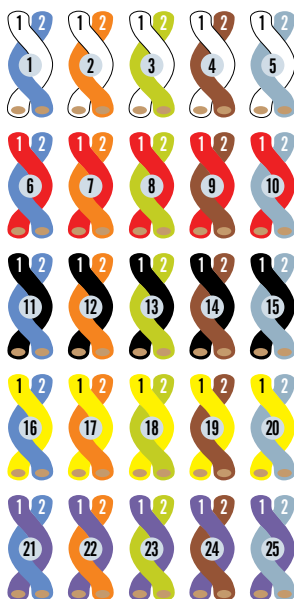
Figure 3.1 – Twisted-Pair Cabling Types



## Twisted-Pair Wiring Color-Code Chart

The 25-pair color code is used to identify individual conductors of multiconductor twisted-pair cabling used primarily in backbone applications. The colors are applied to the insulation that covers each conductor. The first color is chosen from one group of five colors and the other from a second group of five colors, giving 25 combinations of two colors.

Table 3.1 — Twisted-Pair Wiring Color-Code Chart



Color Codes		2nd Color									
		Blue		Orange		Green		Brown		Slate	
Wire No. in Pair		1	2	1	2	1	2	1	2	1	2
1st Color	White	1		2		3		4		5	
	Red	6		7		8		9		10	
	Black	11		12		13		14		15	
	Yellow	16		17		18		19		20	
	Violet	21		22		23		24		25	

Pair No.	1st Wire	2nd Wire	Pair No.	1st Wire	2nd Wire
1	White	Blue	14	Black	Brown
2	White	Orange	15	Black	Slate
3	White	Green	16	Yellow	Blue
4	White	Brown	17	Yellow	Orange
5	White	Slate	18	Yellow	Green
6	Red	Blue	19	Yellow	Brown
7	Red	Orange	20	Yellow	Slate
8	Red	Green	21	Violet	Blue
9	Red	Brown	22	Violet	Orange
10	Red	Slate	23	Violet	Green
11	Black	Blue	24	Violet	Brown
12	Black	Orange	25	Violet	Slate
13	Black	Green			

Figure 3.2 – Twisted-Pair Color-Code Chart

The Difference Between Cat 5e, Cat 6 and Cat 6A Performance Levels

When supporting Ethernet applications for twisted-pair cabling, the guidelines below shall be considered. Different applications may require different cabling performance levels to achieve desired distance requirements. For example, 10 Gigabit Ethernet at 100 meters will require TIA Augmented Cat 6 or ISO E<sub>A</sub> cabling.

Table 3.3 shows the maximum twisted-pair cabling distances from the TIA wiring and IEEE Ethernet standards.

Table 3.3 — TIA Cat 5e Versus TIA Cat 6 Versus TIA Augmented Cat 6 Versus ISO Class E<sub>A</sub>

Data Rate	TIA Cat 5e	TIA Cat 6	TIA Augmented Cat 6	ISO Class E <sub>A</sub>
10 Mbps	Yes	Yes	Yes	Yes
100 Mbps	Yes	Yes	Yes	Yes
1 Gbps	Yes	Yes	Yes	Yes
10 Gbps (55 m)	No	Yes	Yes	Yes
10 Gbps (100 m)	No	No	Yes	Yes



#### Anixter's ipAssured<sup>SM</sup> Program for Security Applications

Factors that affect the performance of cabling infrastructure:

- The migration of a security system to IP
- Minimally compliant Category 5e cable
- Increasing bandwidth requirements
- The need for Power over Ethernet Plus and beyond
- Installation practices
- Environmental conditions
- Quality of IP cable manufacturing

Tests conducted at the Anixter Infrastructure Solutions Lab showed that everyday factors, such as additional bandwidth requirements to accommodate more and more IP devices and elevated temperatures found in many cabling installations, can dramatically affect video quality and network performance. With 50 percent of network problems attributed to the cabling system, one way to minimize network downtime and experience the full benefits of IP's capabilities is to invest more into the physical layer infrastructure.

Anixter ipAssured is an infrastructure assurance program that matches the cabling infrastructure to the security equipment based on the technical, application and life-cycle requirements of the user. Anixter ipAssured provides cabling recommendations based on applications a company is running. The results from the testing done in The Lab allow Anixter to make cabling recommendations based on the planned life cycle of the security applications. Divided into IP-Class<sup>SM</sup> 1+ (1 to 5 years), IP-Class 5+ (5 to 10 years) and IP-Class 10+ (more than 10 years), Anixter ipAssured provides a robust cabling infrastructure for the entire planned life cycle of the equipment.

To learn more about how ipAssured can save money and protect your investments, visit **[anixter.com/ipassured](http://anixter.com/ipassured)**.

**Ask your Anixter sales representative about  
Anixter ipAssured<sup>SM</sup> for data centers!**



## Bend Radius

It is important not to change the geometry of the cable. Bend radius is the maximum arc into which a cable can be looped before its data transmission is impaired.

The minimum bend radius for UTP and F/UTP cable is four times the cable diameter. The bend radius for multipair cable should follow the manufacturer's guidelines. The minimum bend radius for cord cable (patch cord) is one times the cord cable diameter.

When you bend a cable too much, you separate the pairs within the jacketing, which can result in performance degradation. Cables are manufactured very carefully.

There is a specific twist scheme/pair lay within the jacketing of the cable.

Bending it too much will disturb the benefits of the cable's manufacturing.

Exceeding the bend radius could kink or crimp the copper, causing signal reflections.

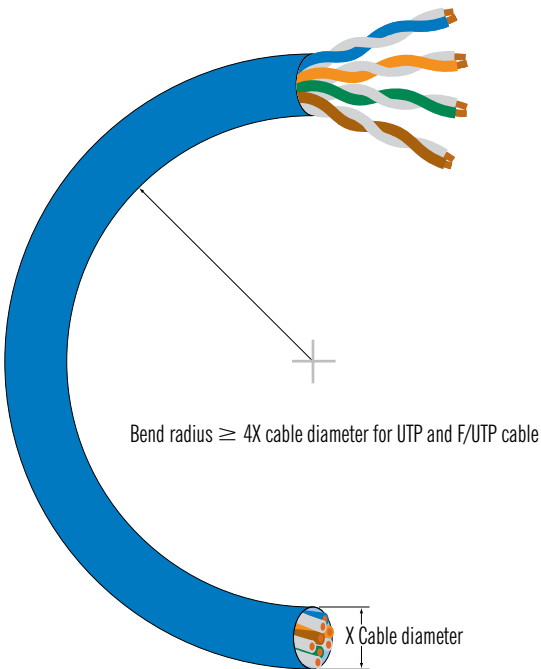


Figure 3.3 – Minimum Bend Radius UTP and F/UTP Cable

#### Twisted-Pair Connectors

A registered jack (RJ) is a standardized physical network interface for connecting telecommunications or data equipment. The physical connectors that registered jacks use are mainly of the modular connector and 50-pin miniature ribbon connector types. The most common twisted-pair connector is an 8-position, 8-contact (8P8C) modular plug and jack commonly referred to as an RJ45 connector.



Figure 3.4 – Twisted-Pair Connectors

#### RJ45

- An 8-pin/8-position plug or jack is commonly used to connect computers onto Ethernet-based local area networks (LAN).
- Two wiring schemes—T568A and T568B—are used to terminate the twisted-pair cable onto the connector interface.



Figure 3.5 – RJ45

**GG45**

- GG45 is a connector for high-speed Category 7 (S/FTP) cabling systems.
- It was standardized in 2001 as IEC 60603-7-7.



Figure 3.6 – GG45

**RJ21**

- A modular connector using 50 conductors is usually used to implement a 25-line (or less) telephone connection.
- High-performance versions of the connector can support Category 5e transmission levels.



Figure 3.7 – RJ21

#### Testing

Verification of the transmission performance of the installed cabling system is recommended by the ANSI/TIA 568-C.2 standard. The primary field test parameters for twisted-pair cabling systems include:

- Impedance or return loss
- Attenuation or insertion loss
- Near-end crosstalk
- Power-sum crosstalk
- Attenuation-to-crosstalk ratio
- Far-end crosstalk
- Propagation delay and delay skew
- Noise.

Wire mapping is the most basic and obvious test for any twisted-pair cable installation. A proper wire-mapping tester can detect any of the following faults:

- Open pair
- Shorted pair
- Short between pairs
- Reversed pairs
- Crossed pairs



## STEP-BY-STEP — TWISTED-PAIR CABLE PREPARATION AND CONNECTOR TERMINATION

The following steps will guide you through the preparation and termination process for UTP cable. Following these guidelines will help ensure that you receive the optimum performance from the twisted-pair cabling.



**Step 1:** The tools you will need:

- Jacket stripper
- Punch-down tool (not shown)
- Wire cutters (not shown)



**Step 2:** Insert cable into stripping tool to the desired strip length. Strip off only as much cable jacket needed to properly terminate the pairs (1 to 1½ inches should be sufficient to terminate pairs).



**Step 3:** Holding the cable near the tool, rotate the tool around the cable several times.



**Step 4:** Slightly bend the outer jacket and manually remove the cut piece or slide the cut outer jacket with the stripper.



**Step 5:** Bend each pair in one direction to expose the rip cord, binder or cross-web filler on the cable.



**Step 6:** Remove the rip cord, binder or cross-web filler if they are present on the cable, leaving only the twisted pairs of wire. The cross-web filler should be cut as flush as possible to the jacket.



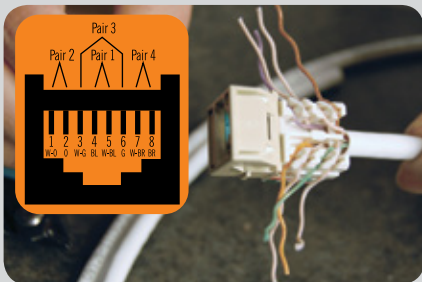
**Step 7:** Determine the wiring scheme and properly align all four cables accordingly on the jack. Keep the cable jacket as close to the connector as possible. Always use connectors, wall plates and patch panels that are compatible (same rating or higher) with the grade of the cable used.



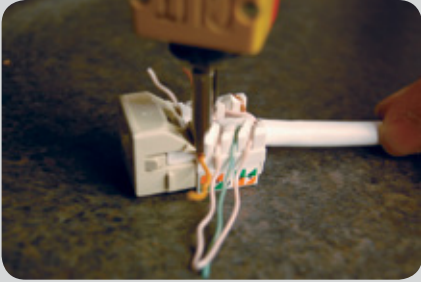
**Step 8:** Preserve the wire pair twists as close as possible to the point of termination. When connecting jacks and plugs, do not untwist the cable more than 0.5 inches for Category 5e, 6 and 6A cable.

**Helpful Hint:**

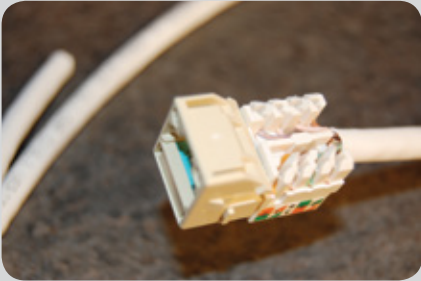
- A half of an inch of an untwisted wire pair results in 1.5 dB of near-end crosstalk.



**Step 9:** Insert wires down into IDC terminal slots to position them before punching down. Ensure that the twist is maintained. To “future-proof” an installation, terminate all four pairs. The picture above shows an outlet being wired to the T568B wiring scheme.



**Step 10:** When using a punch-down tool, make sure the tool is straight before punching down on the connector. Make sure the cut-side of the tool is facing outward.



**Step 11:** Inspect the connector to ensure the wires are fully engaged in the IDC terminals and they are cut properly.



Step 12: Place a dust cover on the jack for protection.



Step 13: This is how your assembled jack should look.

# 4. COAXIAL CABLE

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**STEP-BY-STEP — COAXIAL CABLE PREPARATION  
AND COMPRESSION CONNECTOR  
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## SECTION 4: COAXIAL CABLE

### Coaxial Cable

Coaxial cable is a two-conductor electronic cable that is used as the transmission medium for a variety of applications such as analog baseband video (closed circuit television (CCTV)), RF broadband video (such as cable television (CATV) and satellite) and for some data, radio and antenna applications. It is constructed to provide protection against outside signal interference.

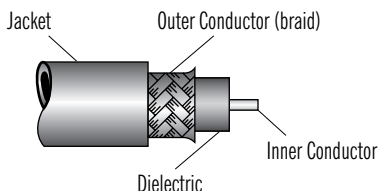
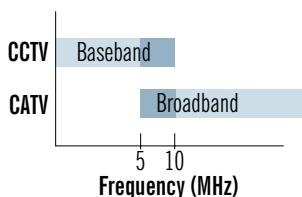


Figure 4.1 – Flexible Coax

### Coaxial Cable Wiring Descriptions – CCTV and CATV

CCTV operates in a lower frequency range than CATV and requires different cable constructions. Be sure that the cable used is chosen accordingly. The primary differences are based on the frequency range differences as shown below (see Figure 4.2).



■ = Skin effect\* begins in this frequency range

Figure 4.2 – CATV and CCTV Frequency Ranges

**\* Note:** Skin effect is the tendency of alternating current, as its frequency increases, to travel only on the surface of a conductor. In copper-clad steel coax, the high-frequency signal travels only on the copper “skin.”



Table 4.1 – Conductor Types

Type	Description
CCTV	Solid bare copper Stranded bare copper (for pan tilt, zoom)
CATV	Solid/stranded bare copper Copper-covered steel
Precision Digital	Solid bare copper

Table 4.2 – Shield Types

Type	Description
CCTV	95 percent bare copper braid
CATV	65–95 percent aluminum braid plus one or more aluminum shields
Precision Digital	85–95 percent tinned copper braid plus one or more foil shields

CATV requires a foil shield to contain high-frequency noise in order to comply with FCC regulations. CATV sometimes uses copper-covered steel. Because of this conductor type, care should be given to not damage cutters when handling the steel in CATV coax.

Table 4.3 – Coaxial Cable Construction Types

Type	Description
Miniature Coax 75 ohm – usually used in CCTV headends and for precision analog and digital video applications such as component video or audio.	Single or bundled (multiple unit) coax construction from 23-30 AWG with either a tinned or bare solid copper conductor or a stranded conductor. Shielding is a 90–95 percent braid with a foil shield.
RG-59 – An inexpensive 75-ohm cable used for flexibility, small size and shorter run lengths available in numerous varieties.	CCTV: #20 AWG solid copper conductor, 95 percent coverage bare copper braid shield  CATV: #20 AWG copper-covered steel conductor, numerous foil and braid shields available
RG-6 – mid-cost longer run-length capability than RG-59 that is often used in distribution of video signals in commercial buildings and CATV applications.	CCTV: #18 AWG solid copper conductor, 95 percent coverage bare copper braid shield  CATV: #18 AWG copper-covered steel conductor, numerous foil and braid shields available
RG-11 – higher cost used in long run-length, low-attenuation applications where larger size is acceptable.	CCTV: #14 AWG solid copper conductor, 95 percent coverage bare copper braid shield  CATV: #14 AWG copper-covered steel conductor, numerous foil and braid shields available

**Note:** This is not a complete list. It covers the most common types of 75-ohm coaxial cables. The installation methods outlined in the guide are common practice for many types of coaxial cables.

## Coaxial Connectors

Coaxial connectors are components attached to the end of a coaxial cable that connect with an audio, video, data or other device to prevent interference and damage.



Figure 4.3 – Coaxial Connectors

- Coaxial connectors are designed to maintain the coaxial shielding.
- Connectors included in this designation are the widely used F and BNC connectors.

## BNC Connector

- They are the most common connector for CCTV (baseband) coax cables.
- 50-ohm connectors are rated to 4 GHz.
- 75-ohm, 4 GHz connectors are available to meet the demands of 75-ohm coax cables.
- They are commonly used in distributed video applications.

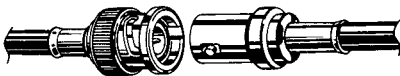


Figure 4.4 – BNC Connector

These are common on all CCTV (baseband) cables; not just miniature cables.

## F Connector

- The 75-ohm, screw-threaded couplers are used with RG-59, RG-6 and RG-11 type coaxial cables.
- It is standard for cable television systems.
- It is simple to install and economical.
- It meets the specifications of CATV/MATV systems.
- A single crimp on the attached ferrule terminates the connector.

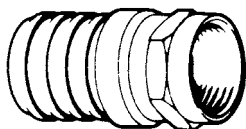


Figure 4.5 – F Series Coax Connector

## Bend Radius

Current military coaxial standards do not specify bend radius; however, various manufacturers do provide guidance. Check with manufacturers for specifics.

Special care should be taken when pulling a coaxial cable around bends. Using too much force or too tight of a bend can deform the dielectric and cause a drop in transmission performance.

## Testing

Testing coax performance includes the following:

- Impedance anomaly
- Return loss
- Attenuation or insertion loss
- Signal level

**Note:** Use a signal strength meter to verify that the right signal level is available (check installed length and possible damage). Contact your Anixter sales representative to learn more about tools available for testing coax.

Table 4.4 – Typical Maximum Length

	RG-59	RG-6	RG-11
CCTV	750–1,000 ft.	1,000–1,500 ft.	1,500–3,000 ft.

Range depends on cable and connector performance, environment, signal frequency, and transmission and reception equipment.

## STEP-BY-STEP — COAXIAL CABLE PREPARATION AND COMPRESSION CONNECTOR TERMINATION

The following steps will guide you through the preparation and termination process for coaxial cable with compression connectors. Following these guidelines will help ensure that you receive the optimum performance from the coaxial cable.

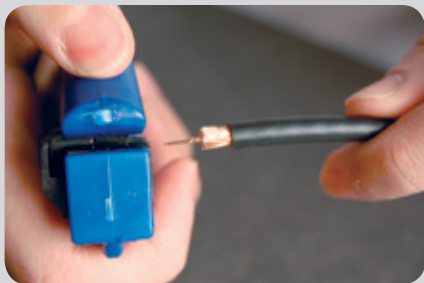


**Step 1:** The tools you will need:

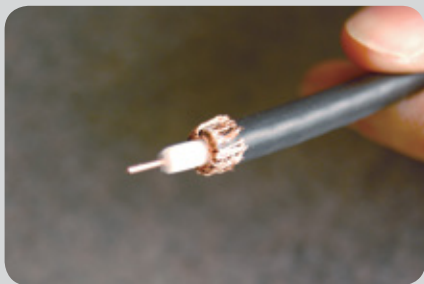
- Compression tool
  - Cable stripper
  - Compression connectors
- **To order these tools, call your local Anixter sales representative or request a quote using Anixter's online catalog at [anixter.com/catalog](http://anixter.com/catalog).**



**Step 2:** Adjust the blades of the stripper to expose  $\frac{1}{4}$  inch of the conductor and  $\frac{1}{4}$  inch of the insulation. Insert the coax cable into the strip cartridge to the adjusted length.



**Step 3:** Holding the cable near the tool, rotate the cutter around the cable (three to five full turns) to score the jacket and cut through the insulation. Be sure the braid is cut (you can hear when the wires of the braid have all been cut). Then flex the jacket to separate and slide it off to expose the center conductor.



**Step 4:** Flare and bend back the remaining outer braid onto the cable outer jacket. Make sure to remove any stray or loose braids. Stray or loose braids can cause shorts if they touch the center conductor. Ensure the center conductor and the insulation are not nicked or scored.

- **When handling cables with multiple braids, such as quad-shield, refer to the manufacturer's literature for proper braid handling techniques.**



**Step 5:** Insert the sleeve ferrule and BNC body onto the coaxial cable. Firmly push the cable as far as possible or until  $\frac{1}{8}$  inch of the center conductor is protruding from the connector.

- **Make sure the connector is fully seated and the white dielectric material is firmly pushed against the inner stop of the connector. You can see this by looking into the open end of some connectors.**



**Step 6:** Insert the cable and connector into the crimping device, ensuring that it is positioned firmly. Squeeze the crimper handle tightly. Use a ratcheting tool that does not release until the proper crimping displacement has been applied for the specific cabling and connector type. Once the tool releases after the final “click,” the crimp should be complete.



**Step 7:** Inspect the connection making sure that there's no braiding exposed and that the connector is firmly attached to the cable.



# 5. FIBER OPTIC CABLES

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## SECTION 5: FIBER OPTIC CABLES

Fiber optic cables consist of a central core that carries light and an outer cladding that completes the guiding structure. There are two basic fiber types: single-mode and multimode.

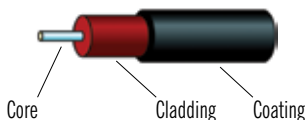


Figure 5.1 – Fiber Optic Cable

### Single-Mode

- Core diameter of 8 to 10 microns
- Normally used for long-distance requirements and high-bandwidth applications
- Does not bounce light off the surrounding cladding as it travels

### Multimode

- Allows more than one mode of light to travel through the cable
- Typical wavelengths of 850 and 1,350 nanometers (nm)
- Normally used in LAN applications

### Multimode Fiber Optic Cable Types

#### Multimode 62.5-micron fiber:

- 62.5-micron core diameter
- 125-micron cladding diameter

#### Multimode 50-micron fiber:

- 50-micron core diameter
- 125-micron cladding diameter
- Increased bandwidth with smaller size
- Greater bandwidth with laser-optimized 50-micron fiber



Figure 5.2 – Fiber Types and Sizes

## Fiber Optic Connectors



Figure 5.3 — ST has a bayonet mount and a long cylindrical ferrule to hold the fiber. It is commonly used in building applications.

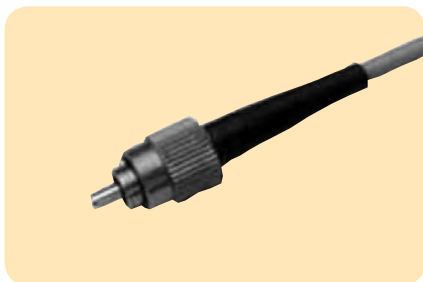


Figure 5.4 — FC has a 2.5 mm ferrule tip with screw-on mechanism. It is keyed to prevent tip rotation and damage to the mated fiber. It is are typically used for single-mode applications.



Figure 5.5 — SC is a snap-in connector that latches with a simple push-pull motion that is available in a duplex configuration. It is commonly used in building applications.

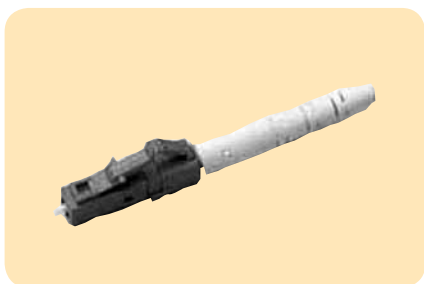


Figure 5.6 — LC is a small form factor (SFF) connector that uses a 1.25 mm ferrule, is half the size of the ST, and is a standard ceramic ferrule connector that provides good performance. It is highly favored for single-mode and is easily terminated with any adhesive. It is commonly used in building applications.



Figure 5.7 — MT-RJ is a small form factor (SFF) duplex connector with both fibers in a single polymer ferrule that uses pins for alignment, has male and female versions, and field terminates only by prepolished and splice methods. It is commonly used in building applications.



Figure 5.8 — MTP/MPP is a high-density multifiber connector used with ribbon fiber cables and is an improvement as compared to the original MPO (multifiber push-on) connector.

MTP connectors house up to 12 and sometimes more optical fibers in a single ferrule.

Applications include horizontal zone cabling, high-density backbones, data centers and industrial operations.

Attachment Methods

There are several different attachment methods for installing fiber connectors like those shown on the previous few pages. Below are descriptions of each attachment method along with an explanation of the pros and cons of each.

Table 5.1 – Attachment Methods – Pros and Cons

Fiber Optics Attachment Method	Pros	Cons
Heat-cure style – epoxy	Cost effective	Long termination time (typically 15 minutes)  Long cure time (typically 30 minutes)
Quick-cure style – UV-cure	Faster install than heat-cured  99 percent yield	Requires a UV light source  Requires a special ferrule with glass capillary  Limited resistance to environmental extremes
Quick-cure style – Anaerobic	Faster install than heat-cured  99 percent yield	Short shelf life
Nonadhesive – Mechanical grip or crimp	Speedy install  No curing involved	Polishing still required
Nonadhesive – No-cure, no-polish	Faster install  No epoxy, no polish	Higher cost  Special tools required

## Bend Radius

It is important not to change the geometry of the cable. Changing the geometry of the cable can negatively impact the transmission performance. Bend radius is the maximum arc into which a cable can be looped before its data transmission is impaired. The minimum bend radius for optical fiber cable is 10 times the diameter.

**Table 5.2 – Optical Fiber Bend Radius**

Fiber Type	Bend Radius
Small inside plant cable (2–4 fibers)	1 in. (no load) 2 in. (with load)
All other inside plant cable	10 x diameter (no load) 20 x diameter (with load)
Outside plant cable	10 x diameter (no load) 20 x diameter (with load)

### Testing



Figure 5.9 – Fiber Optic Cable Tester

Attenuation is the parameter most frequently measured and includes the attenuation of the cable as well as that of attached connectors. Attenuation testing is done with an Optical Loss Test Set (OLTS). Cable attenuation can be caused by microbending, poorly installed connectors, the presence of dirt on the end face of a connector, excessive mechanical force on the cable or, of course, a broken fiber.

There are two tiers of optical field testing defined in the standards:

- Tier 1: Mandatory – Tests attenuation and verifies cable length and polarity
- Tier 2: Optional – Includes the Tier 1 tests plus an optical time domain reflectometer (OTDR) trace

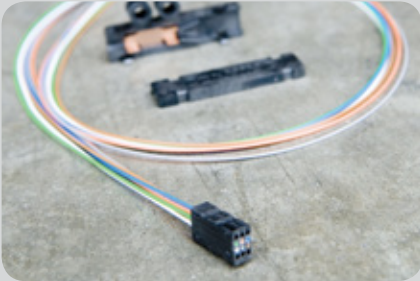


## STEP-BY-STEP — FIBER OPTIC CABLE PREPARATION AND CONNECTOR TERMINATION

The following steps will guide you through the preparation and termination process for a no epoxy, no polish fiber optic SC connector. Following these guidelines will help ensure that you receive the optimum performance from the fiber optic cable.

There are numerous other methods for terminating fiber optic connectors.

See Table 5.1 on page 52 for all the methods.



Step 1: The tools you will need:

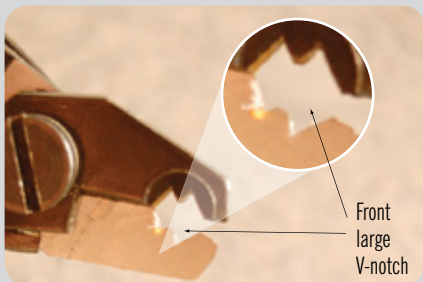
- Fiber stripper
  - Ruler
  - Marker
- To order these tools, call your local Anixter sales representative or request a quote using Anixter's online catalog at [anixter.com/catalog](http://anixter.com/catalog).



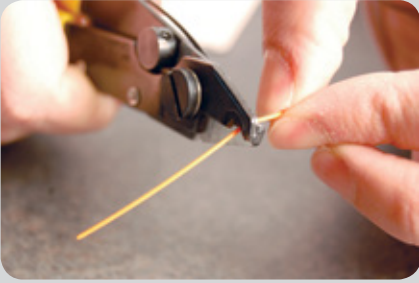
**Step 2:** Measure from the end of the fiber to 40 mm and mark the cable.



**Step 3:** Slide the strain-relief boot onto the cable.



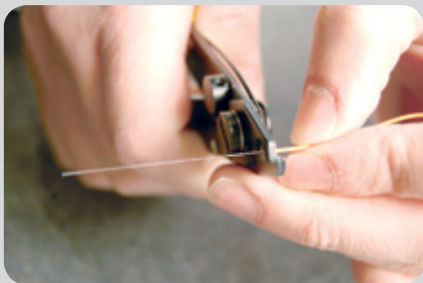
**Step 4:** Make sure the stripper's cutting face is clean. Use the front, large V-notch on the cable stripper to remove the 900-micron tight buffer.



**Step 5:** Carefully clamp down on the cable halfway down from the mark you made.



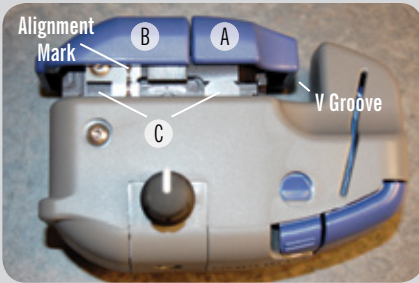
**Step 6:** Keeping the pressure light, carefully slide the jacket off of the fiber. Be careful to avoid breaking the fragile glass fiber. Repeat step to remove the remaining 20 mm of jacket.



**Step 7:** Carefully remove any of the leftover 250-micron coating (notice the white film on the fiber) using the smaller, back V-notch on the tool.



**Step 8:** Clean the bare fiber with two passes of a fiber wipe dampened with fiber optic cleaning fluid. Do not touch the bare fiber after cleaning it.



**Step 9:** Ensure that both clamps (C) are clean and free of fiber. Squeeze buttons A and B at the same time to open clamps.



**Step 10:** Place fiber in the slot so the bare fiber is in the V-groove, the buffer or coating is aligned with the alignment mark, and the fiber rests under the tab. Fully release button B then button A. Ensure both the bare and coated fiber is secured by the clamps.



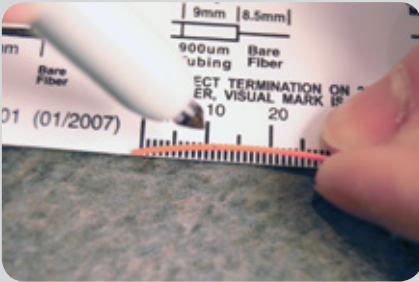
**Step 11:** Slowly turn the knob 360 degrees to cut the fiber.



**Step 12:** Squeeze button A, remove the scrap fiber and place it in the scrap fiber bin.



**Step 13:** While holding onto the fiber, squeeze button B and remove the cleaved fiber.



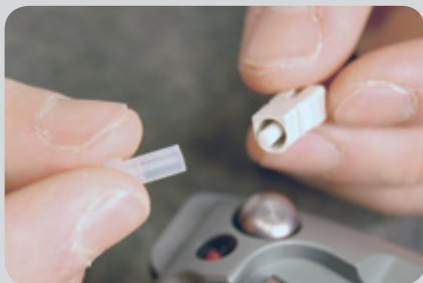
**Step 14:** Measure and mark an additional 11 mm on the fiber jacket.



**Step 15:** Ensure the components are in the starting position. If not, slide the VFL coupler back toward the cover hinge until it locks. Verify the load button is released and the connector cradle is against the travel stop. Depress the reset button to return the wrench to the start position.



**Step 16:** Ensure the correct ferrule adapter is installed. Switch the power on. If the power light flashes or does not glow, the batteries need to be replaced.



**Step 17:** Remove the dust cap from connector and squeeze the load button to move the connector cradle away from the wrench.





**Step 18:** With the connector oriented up, load the connector into the tool by inserting it (lead-in tube first, into the wrench).

Slowly release the load button while guiding the connector into the connector cradle.



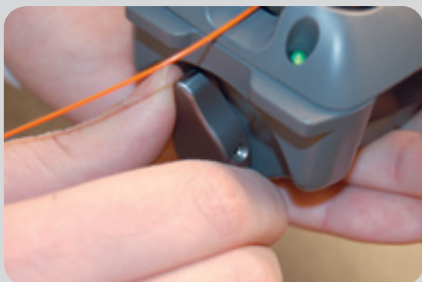
**Step 19:** Slide the VFL coupler down until the ferrule adapter is seated on the connector.



**Step 20:** Close the cover and check for the error light. If the error light remains off, there are no problems.

Insert the cleaved fiber into the back of the lead-in tube. Insert the fiber until you feel it firmly stop against the fiber stub. The visual mark should be within 2 mm of the lead-in tube.

While maintaining enough inward pressure, squeeze the CAM button in until it locks. Check the termination lights. If the green light is illuminated, the termination was successful. If the red light is illuminated, press the reset button, remove the fiber and repeat the termination process.



**Step 21:** Turn the crimp knob 180 degrees in either direction to crimp and lock the connector into the fiber.



**Step 22:** Open the cover and slide the VFL coupler back into its starting position. Slightly squeeze the button to remove the connector.

Ensure the clear ferrule dust cap is installed. Slide the boot up the back of the connector until it reaches the cam.



**Step 23:** Install the outer shroud by lining up the date code with the key-side of the outer shroud. Using the boot, push the assembly into the outer shroud until it snaps into place.



Step 24: The fiber connector is completed.

# 6. CONDUIT, CABLE BASKET AND LADDER FILL RECOMMENDATIONS

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Cable Basket and Ladder Fill Recommendations ..... 69

## SECTION 6: CONDUIT, CABLE BASKET AND LADDER FILL RECOMMENDATIONS

### Conduit Fill Recommendations

Conduit fill states the maximum amount of space that the installed cables should occupy in a given size conduit expressed as a percentage of the interior volume. When designing a conduit run, consider not only the cable being installed now but also the likelihood of having to add cables in the future.

**Table 6.1 (right)** makes recommendations for the maximum cables to be installed in conduit.

- Clearance should be  $\frac{1}{4}$  inch at minimum and up to 1 inch for large cable installations or installations involving numerous bends.
- When calculating clearance, ensure all cable diameters are equal.
- Do not exceed recommended conduit fill requirements.
- Typical OD for twisted-pair cabling is 0.25 to 0.35 inch.

Table 6.1 – Conduit Fill Recommendations

Trade Size (in.)	1/2	3/4	1	1 1/4	1 1/2	Calc. Cable Area (in. <sup>2</sup> )	Cable OD (in.)
Max No. of Cables	2	4	7	12	16	0.04909	0.25
	2	4	6	11	16	0.05107	0.255
	1	4	6	11	15	0.05309	0.26
	1	4	6	11	14	0.05515	0.265
	1	3	6	10	14	0.05726	0.27
	1	3	6	10	13	0.0594	0.275
	1	3	5	9	13	0.06158	0.28
	1	3	5	9	12	0.06379	0.285
	1	3	5	9	12	0.06605	0.29
	1	3	5	8	12	0.06835	0.295
	1	3	5	8	11	0.07069	0.3
	1	3	4	8	11	0.07306	0.305
	1	3	4	8	10	0.07548	0.31
	1	2	4	7	10	0.07793	0.315
	1	2	4	7	10	0.08042	0.32
	1	2	4	7	10	0.08296	0.325
	1	2	4	7	9	0.08553	0.33
	1	2	4	6	9	0.08814	0.335
	1	2	4	6	9	0.09079	0.34
	1	1	3	6	8	0.09348	0.345
	1	1	3	6	8	0.09621	0.35

\* Note: 0.25 inch = Typical Category 6  
 0.35 inch = Worst-case Category 6A

Cable basket and ladder tray fills may vary by manufacturer. Check with your supplier for specific recommendations.

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.



# 7. ADMINISTRATION

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## SECTION 7: ADMINISTRATION

### Administration

Modern buildings require an effective telecommunications infrastructure to support the wide variety of services that rely on the electronic transport of information. Administration includes basic documentation and timely updating of drawings, labels and records. Administration should be synergistic with voice, data and video telecommunications, as well as with other building signal systems, including security, audio, alarms and energy management.

Administrative record keeping plays an increasingly necessary role in the flexibility and management of frequent moves, adds and changes. The ANSI/TIA-606-A standard concisely describes the administrative record keeping elements of a modern structured cabling system.

### Elements of an Administration System per the ANSI/TIA-606-A Standard

- Horizontal pathways and cabling
- Backbone pathways and cabling
- Telecommunications grounding and bonding
- Spaces (e.g., entrance facility, telecommunications room, equipment room)
- Firestopping

### Classes of Administration

Four classes of administration are specified in this standard to accommodate diverse degrees of complexity present in telecommunications infrastructure. Each class defines the administration requirements for identifiers, records and labeling. An administration system can be managed using a paper-based system, general-purpose spreadsheet software or special-purpose cable management software.

### Class 1 Administration

Class 1 Administration addresses the administration requirements for a building or premise that is served by a single equipment room (ER). The following infrastructure identifiers shall be required in Class 1 Administration when the corresponding elements are present:

- Telecommunications space (TS) identifier
- Horizontal link identifier
- Telecommunications main grounding busbar (TMGB)
- Telecommunications grounding busbar (TGB)

## Class 2 Administration

Class 2 Administration addresses the administration of infrastructure with one or more telecommunications spaces (TS) in a single building. The following infrastructure identifiers shall be required in Class 2 Administration when the corresponding elements are present:

- Identifiers required in Class 1 Administration
- Building backbone cable identifier
- Building backbone pair or optical fiber identifier
- Firestopping location identifier

Class 2 Administration may additionally include pathway identifiers.

## Class 3 Administration

Class 3 Administration addresses infrastructure with multiple buildings at a single site.

The following infrastructure identifiers shall be required in Class 3 Administration:

- Identifiers required in Class 2 Administration
- Building identifier
- Campus backbone cable identifier
- Campus backbone pair or optical fiber identifier

The following infrastructure identifiers are optional in Class 3 Administration:

- Identifiers optional in Class 2 Administration
- Outside plant pathway element identifier
- Campus pathway or element identifier

Additional identifiers may be added if desired.

## Class 4 Administration

Class 4 Administration addresses infrastructure with multiple sites or campuses.

The following infrastructure identifiers shall be required in Class 4 Administration:

- Identifiers required in Class 3 Administration
- Campus or site identifier

The following infrastructure identifiers are optional in Class 4 Administration:

- Identifiers optional in Class 3 Administration
- Intercampus element identifier

Additional identifiers may be added if desired.

[illegible]

# 8. ABOUT ANIXTER

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## SECTION 8: ABOUT ANIXTER



### The Anixter Difference

We're proud to serve more than 100,000 customers across 50 countries every day with our world-class inventory, global capabilities, technical expertise and Supply Chain Solutions. Our specialized sales force focuses on enterprise cabling solutions, security solutions, electrical and electronic wire and cable, and fasteners.

- We stock more than 450,000 items from the world's premier manufacturers and move them cost effectively through our global distribution network that encompasses more than 7 million square feet of distribution space.
- We view technical know-how as an essential part of our value to our customers. You can always count on Anixter for reliable up-to-date technical advice and assistance.
- With a wide variety of Supply Chain Solutions to choose from, we provide our customers with the opportunity to save money by increasing their ability to be efficient and avoid costly delays.



## Our Products

It seems simple enough: you need something, you call a distributor and you buy it. In the real world, there are complicated systems, small parts, and constantly changing technical developments and requirements. Just determining what you need can be an all-consuming process, and missing a crucial component can add significant costs and delays to a project.

At Anixter, we take the worry out of just-in-time product availability. With more than \$1 billion in our global inventory, we have the product expertise to ensure the right product is delivered where and when it is needed.

Anixter is the distributor to call if you need products and systems for:

- Network cabling (copper and fiber)
- Networking, wireless and voice electronics
- Security solutions (video surveillance, access control, architectural hardware, key systems/key control)
- Electrical wire and cable (power cable)
- Electronic wire and cable (coaxial, multipair, multiconductor, etc.)
- Fasteners and other small components ("C" Class)



### Our Technical Expertise

Across the world, Anixter has more than 2,800 sales specialists in three divisions that serve the enterprise cabling and security, electrical and electronic wire and cable, and OEM fasteners markets. Anixter's technical experts serve those markets by specifying IP-based security solutions, managing incoming part quality, developing engineering specs and evaluating networking performance. With years of experience in specifying products and solutions, Anixter salespeople are well trained to identify and understand each customer's needs and requirements.

A network of technical experts make up Anixter's Technology Solutions group to better serve our customers. Anixter's systems engineers (SEs) receive ongoing, extensive training about new products, technologies, applications and market trends. In addition, many SEs participate in local standards and industry committees and associations, which keeps them current on the latest standards being introduced into the market. Anixter also employs more than 100 Registered Communications Distribution Designers (RCDDs), the highest networking infrastructure design certification available.

In every part of its business, Anixter welcomes the opportunity to support customers' purchasing decisions. The industry and customers can rely on Anixter to keep them current on the latest products, standards and emerging technologies.





### The Anixter Infrastructure Solutions Lab

Anixter's Infrastructure Solutions Lab actively demonstrates the best practical technological solutions from best-in-class manufacturers in the area of enterprise cabling, video security and access control for its customers. The mission for The Lab is simple — educate, demonstrate and evaluate.

- Educate customers on the latest industry standards and technologies
- Demonstrate the latest infrastructure product solutions available from our manufacturer partners
- Evaluate our network infrastructure and security solutions to ensure that customers are selecting the right products for their specific needs

The Lab continually tests products to ensure:

- Quality products are recommended and delivered to customers
- Consistency of performance across product lines and within systems
- Interoperability of products and systems to ensure customers can integrate systems and follow the trend toward convergence.



### Anixter ipAssured<sup>SM</sup>

Anixter ipAssured protects a network investment by matching the infrastructure to an end-user's technical and life-cycle requirements. ipAssured for data centers provides users with products and best practices for creating a robust infrastructure that will maximize efficiency and sustainability. ipAssured for physical security applications helps determine the optimum cabling infrastructure choice for the applications a facility is running today and tomorrow. **For more information, visit [anixter.com/ipassured](http://anixter.com/ipassured).**



### Supply Chain Solutions

The foundation to an efficient deployment is having a fundamental distribution network that leverages an extensive product inventory with coordinated deliveries. Fundamental distribution services should include:

- The ability to view and allocate inventory in any warehouse in a nationwide network
- A significant investment in a diverse breadth of inventory
- IT systems that provide customers real-time information
- Predictable (e.g., next day ground service) delivery times to help plan even the most complicated of projects.

Anixter takes fundamental distribution a step further by applying the best practices of supply chain principles to the reality faced every day with technology deployments.

Anixter's goal is to help customers:

- Reduce costs
- Complete projects on time and on budget
- Improve efficiency
- Create scalable and repeatable services.



### READY!™ Deployment Services

READY! Deployment Services by Anixter map our distribution and Supply Chain Solutions to the construction or deployment process of any technology project. We combine sourcing, inventory management, kitting, labeling, packaging and deployment services to simplify and address the material management challenges at the job site(s). READY! Deployment Services by Anixter will help you improve the speed of deployment, lower your total cost of deployment and ensure your product specifications are delivered as planned. READY! Deployment Services can:

- Simplify material management at the job site
- Simplify on-site storage requirements
- Ensure product specifications
- Increase speed of deployment
- Reduce damaged, lost or stolen materials at the job site
- Reduce packaging waste at the construction site
- Minimize will calls, go backs and setup time
- Increase productivity
- Decrease total cost of deployment.

[illegible]

# 9. PRODUCT REFERENCE GUIDE

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For different color cable, replace "06" in the Anixter part number with a number below:

Example: CMP-00424BNT-10-**06**

No # = Natural

01 = White	05 = Yellow	10 = Purple
02 = Black	06 = Blue	11 = Brown
03 = Red	08 = Orange	12 = Pink
04 = Green	09 = Gray	

**Ask your Anixter sales representative about  
Anixter ipAssured<sup>SM</sup> products and solutions!**



## SECTION 9: PRODUCTS AND PART NUMBERS

## Belden

## UTP Cabling

Anixter Part No.	Manufacturer Part No.
CMP-00424BNT-10-06	10GX33 D151000
10GX bonded-pair, Category 6A, plenum, blue	
CM-00424BNT-10-06	10GX32 0061000
10GX bonded-pair, Category 6A, nonplenum, blue	
CMP-00424CDT-10-06	10GX13 D151000
10GX cable, Category 6A, plenum, nonbonded, blue	
CM-00424CDT-10-06	10GX12 0061000
10GX cable, Category 6A, nonplenum, nonbonded, blue	
CMP-00424BEL-7E-06	7852A D151000
DataTwist 4800 bonded-pair, Category 6+, plenum, blue	
CM-00424BEL-7E-06	7851A 0061000
DataTwist 4800 bonded-pair, Category 6+, nonplenum, blue	
CMP-00424FAM-7B-06	1874A D151000
MediaTwist, Category 6, bonded-pairs, plenum, blue	
CM-00424CAM-7B-06	1872A 0061000
MediaTwist, Category 6, bonded-pairs, nonplenum, blue	
CMP-00424IBDN-7RB-06	2413 D15A1000
DataTwist 2400, Category 6, plenum, blue	
CM-00424IBDN-7RB-06	2412 006A1000
DataTwist 2400, Category 6, nonplenum, blue	
CMP-00424IBDN-6U-06	1213 D15U1000
DataTwist 1200, Category 5e, plenum, blue	
CM-00424IBDN-6U-06	1212 006U1000
DataTwist 1200, Category 5e, nonplenum, blue	

See color code on page 83.

## Belden

## Information Outlets

Anixter Part No.	Manufacturer Part No.
MM07-BNT10GC-06	AX102288
Cat 6A KeyConnect modular jack, TIA 606, blue	
245704	AX101326
Cat 6 KeyConnect modular jack, TIA 606, blue	
288803	AX101315
Cat 5e KeyConnect modular jack, TIA 606, blue	

## Faceplates

Anixter Part No.	Manufacturer Part No.
371952	AX102655
KeyConnect faceplate, 2-port, with ID windows, single-gang, elec. white	
363887	AX102249
KeyConnect faceplate, 4-port, with ID windows, single-gang, elec. white	
363563	AX102251
KeyConnect faceplate, 6-port, with ID windows, single-gang, elec. white	

## Patch Panels

Anixter Part No.	Manufacturer Part No.
371652	AX103254
Cat 6A KeyConnect, 24-port, 1U, titanium (loaded)	
371650	AX103253
Cat 6 KeyConnect, 24-port, 1U, black (loaded)	
371648	AX103262
Cat 5e HD-110, 24-port, 1U, black (loaded)	
365104	AX103248
AngleFlex, 24-port, 1U, black (empty)	

## Belden

## Patch Cords

## Anixter Part No.

## Manufacturer Part No.

387774

CA21106007

Cat 6A, bonded-pair blue, 7 ft.

371926

C601106004

Cat 6, bonded-pair, 4 pair, 24 AWG solid, CMR, blue, 4 ft. (1.2 m)

371890

C501106004

Cat 5e, bonded-pair, 4 pair, 24 AWG solid, CMR, blue, 4 ft. (1.2 m)

## High-Density Racking System

## Anixter Part No.

## Manufacturer Part No.

349199

BHRR194

Aluminum relay rack 84 in. H x 19 in. W , #12-24 tapped hole, black

## Single-Sided, High-Density Vertical Managers

## Anixter Part No.

## Manufacturer Part No.

349202

BHVH003

High density with doors, 3 5/8 in. W x 84 in. H, black

349203

BHVH006

High density with doors, 6 in. W x 84 in. H, black

349204

BHVH010

High density with doors, 10 in. W x 84 in. H, black

349206

BHVH012

High density with doors, 12 in. W x 84 in. H, black



## Belden

## Single-Sided, Low-Density Vertical Managers

Anixter Part No.	Manufacturer Part No.
349209	BHVL003
Low density without doors, 3 5/8 in. W x 84 in. H, black	
349211	BHVL006
Low density without doors, 6 in. W x 84 in. H, black	
349213	BHVL010
Low density without doors, 10 in. W x 84 in. H, black	
349215	BHVL012
Low density without doors, 12 in. W x 84 in. H, black	

## Double-Sided, High-Density Vertical Managers

Anixter Part No.	Manufacturer Part No.
349219	BHVHH03
Two high-density vertical managers with doors, 3 5/8 in. W x 84 in. H, black	
349221	BHVHH06
Two high-density vertical managers with doors, 6 in. W x 84 in. H, black	
349222	BHVHH10
Two high-density vertical managers with doors, 10 in. W x 84 in. H, black	
349223	BHVHH12
Two high-density vertical managers with doors, 12 in. W x 84 in. H, black	

## Horizontal Managers with Cover

Anixter Part No.	Manufacturer Part No.
349297	BHH191U
19 in. W x 1U, black	
349298	BHH192UC
19 in. W x 2U, black	
349299	BHH193U
19 in. W x 3U, black	

## Belden

## CCTV Coaxial Cable

Anixter Part No.	Manufacturer Part No.
B543945	543945
RG59 CCTV nonplenum	
B539945	539945
RG6 CCTV nonplenum	
B549945	549945
RG-59 with 18-2 Siamese nonplenum	
B643948	643948
RG-59 CCTV plenum	
B633948	633948
RG6 CCTV plenum	
B639948	639948
RG6 with 18-2 Siamese plenum	

## Audio Video Coaxial Cable

Anixter Part No.	Manufacturer Part No.
B1505A	1505A
RG-59/U SDI/HDTV digital video cable	
B1506A	1506A
RG-59/U plenum SDI/HDTV digital video cable	
B1505F	1505F
RG-59/U flexible SDI/HDTV digital video cable	
B1855A-0	1855A
RG-59/U miniature SDI/HDTV digital video cable	
B1694A	1694A
RG-6/U SDI/HDTV digital video cable	
B1695A	1695A
RG-6/U plenum SDI/HDTV digital video cable	

Continued on next page &gt;&gt;

## Belden

## Audio Video Coaxial Cable (continued)

Anixter Part No.	Manufacturer Part No.
B1279R-0	1279R
Miniature high-res RGB component video cable (5C)	
B1279P	1279P
Miniature plenum high-res RGB component video cable (5C)	

## Compression Connectors (DB Series)

Anixter Part No.	Manufacturer Part No.
DB59BNCU	DB59BNCU
Compression type DBRG59 BNC connector	
DB59BNCHD	DB59BNCHD
Compression type DBRG59 BNC HD connector	
DB6BNCU	DB6BNCU
Compression type DBRG6 BNC connector	
DB6BNCHD	DB6BNCHD
Compression type DBRG6 BNC HD connector	
DB15BNCHD	DB15BNCHD
Compression type DB15RGB HD connector	
CPLCRTC-B	CPLCRTC-B
DB compression tool	

## Berk-Tek/Ortronics

## Berk-Tek UTP Cabling

Anixter Part No.	Manufacturer Part No.
CMP-00424BKT-10G-06	10130484
LANmark 10G2 Category 6A, plenum, blue	
CM-00424BKT-10G-06	10137700
LANmark 10G2 Category 6A, nonplenum, blue	
CMP-00424BKT-7-06	10163222
LANmark 2000 Category 6, plenum, blue	
CMR-00424BKT-7-06	10167476
LANmark 2000 Category 6, nonplenum, blue	
CMP-00424LAN-6U-06	10032065
LANmark 350 Category 5e, plenum, blue	
CM-00424LAN-6U-06	10032426
LANmark 350 Category 5e, nonplenum, blue	
CMP-00424BKTE-5U-06	10032227
Hyper Plus 5e, plenum, blue	
CM-00424BKTE-5U-06	10032528
Hyper Plus 5e, nonplenum, blue	
CM-00424BKT-6-0D	10139885
LANmark 6 outside plant, black	

See color code on page 83.

## Ortronics Information Outlets

Anixter Part No.	Manufacturer Part No.
313099	TJ610
Clarity 10G Category 6A TracJack, fog white	
234120	TJ600
Clarity Category 6 TracJack, fog white	
248920	TJ5E00
Clarity Category 5e TracJack, fog white	

## Berk-Tek/Ortronics

### Ortronics Faceplates

Anixter Part No.	Manufacturer Part No.
189454	40300548
TracJack, single-gang, 2-port, fog white	
189457	40300546
TracJack, single-gang, 4-port, fog white	
189458	40300545
TracJack, single-gang, 6-port, fog white	

### Ortronics Patch Panels

Anixter Part No.	Manufacturer Part No.
352093	PHD610U24
Clarity 10G, Category 6A, 24-port panel	
234470	PHD66U24
Clarity Category 6, 6-port modules, 24-port panel	
248950	PHD5E6U24
Clarity Category 5e, 6-port modules, 24-port panel	

### Ortronics Mighty Mo 10 Cable Management Rings

Anixter Part No.	Manufacturer Part No.
241633	60400614
Snap-type 1.75 in. x 6 in. black, package of 14	
353984	60400542
Snap-type 1.75 in. x 6 in. black, package of two	
353986	60400314
Snap-type 1.75 in. x 3 in. black, package of 14	
353989	60400302
Snap-type 1.75-in. x 3 in. black, package of two	

## Berk-Tek/Ortronics

## Ortronics Mighty Mo 10 Cable Management Racks

Anixter Part No.

Manufacturer Part No.

363051

MM10716

Mighty Mo 10, 16.25 in. D x 7 ft. H black, 45 rack units

363052

MM10816

Mighty Mo 10, 16.25 in. D x 8 ft. H black, 51 rack units

## Ortronics Mighty Mo 10 Server Rack

Anixter Part No.

Manufacturer Part No.

363053

MM107SVR

Four-post aluminum frame with steel EIA rails, 7 in. H, 45 rack units

363054

MM107SVRABR

Server rack baffle rail for mounting airflow baffles

## Ortronics Mighty Mo 10 Cable Management Cage With Door

Anixter Part No.

Manufacturer Part No.

363055

MM10VMD712

Vertical cable manager 12.13 in. x 13 in. x 7 ft. black, 45 rack units

363056

MM10VMD716

Vertical cable manager 16.38 in. x 13 in. x 7 ft. black, 45 rack units

363057

MM10VMD812

Vertical cable manager 12.13 in. x 13 in. x 8 ft. black, 51 rack units

363058

MM10VMD816

Vertical cable manager 16.38 in. x 13 in. x 8 ft. black, 51 rack units

## Ortronics Mighty Mo 10 Airflow Baffles

Anixter Part No.

Manufacturer Part No.

363061

MM10AB71612

For use with 7 ft. x 16 in. MM 10 rack and 12 in. wide MM 10 cage

363062

MM10AB71616

For use with 7 ft. x 16 in. MM 10 rack and 16 in. wide MM 10 cage

Continued on next page &gt;&gt;

## Berk-Tek/Ortronics

## Ortronics Mighty Mo 10 Airflow Baffles (continued)

363063	MM10AB81612
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For use with 8 ft. x 16 in. MM 10 rack and 12 in. wide MM 10 cage	
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363064	MM10AB81616
--------	-------------

For use with 8 ft. x 16 in. MM 10 rack and 16 in. wide MM 10 cage	
---	--

## Ortronics Mighty Mo 10 Vented Door Assemblies

Anixter Part No.

Manufacturer Part No.

363059	MM10VDA7248
--------	-------------

7 ft. x 24 in. with 8.38 in. of clearance behind door for use with VMD vertical managers	
--	--

363060	MM10VDA7244
--------	-------------

7 ft. x 24 in. with 4.38 in. of clearance behind door for use without vertical managers	
---	--

## Ortronics Patch Cords

Anixter Part No.

Manufacturer Part No.

MM07-OR10G-06	MC61007-06
---------------	------------

Clarity 10G, Category 6A, blue, 7 ft.	
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MM07-OR7N-06	MC607-06
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Clarity Category 6, blue, 7 ft.	
---------------------------------	--

MM07-OR6C-06	MC5E07-06
--------------	-----------

Clarity Category 5e, blue, 7 ft.	
----------------------------------	--

## Ortronics Mighty Mo 10 Waterfall Extension

Anixter Part No.

Manufacturer Part No.

376945	MM10WFE
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Increases the height of the front flange of the waterfall by 2.25 in. to increase capacity	
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## Chatsworth Products, Inc. (CPI)

## Cabinets

Anixter Part No.	Manufacturer Part No.
400141	FF1L-113C-C42
F-Series TeraFrame Server Cabinet, 45U x 23.6 in. W x 45.1 in. D, perforated front door, double perforated rear door, top panel with two cable openings, and two solid side panels, black	
400142	FF2L-113C-C42
F-Series TeraFrame Server Cabinet, 45U x 27.6 in. W x 45.1 in. D, perforated front door, double perforated rear door, top panel with two cable openings, and two solid side panels, black	
400143	FF2L-113C-C22
F-Series TeraFrame Network Cabinet, 45U x 27.6 in. W x 45.1 in. D, perforated front door, double perforated rear door, top panel with four cable openings and two solid sides, black	
400144	FF3L-113C-C22
F-Series TeraFrame Network Cabinet, 45U x 31.5 in. W x 45.1 in. D, perforated front door, double perforated rear door, top panel with four cable openings and two solid sides, black	
431936	GF-1A220
GlobalFrame Cabinet, 42U x 23.6 in. W x 39.4 in. D, two side panels, standard top panel, black	
434277	GF-1A320
GlobalFrame Cabinet, 42U x 23.6 in. W x 41.3 in. D, two side panels, standard top panel, black	
431938	GF-1A420
GlobalFrame Cabinet, 42U x 23.6 in. W x 47.2 in. D, two side panels, standard top panel, black	
437300	GF-1B320
GlobalFrame Cabinet, 42U x 29.5 in. W x 41.3 in. D, two side panels, standard top panel, black	
438710	GF-1B420
GlobalFrame Cabinet, 42U x 29.5 in. W x 47.2 in. D, two side panels, standard top panel, black	



## Chatsworth Products, Inc. (CPI)

## Racks

Anixter Part No.	Manufacturer Part No.
167074	55053-703
Standard rack, 19 in. W x 7 ft. H x 3 in. D, 15 in. D base, 45 RMU, 1,000 lb. load	
164164	46353-703
Universal rack, 19 in. W x 7 ft. H x 3 in. D, 15 in. D base, 45 RMU, 1,500 lb. load	
249553	50120-703
QuadraRack 4-post frame, 19 in. W x 7 ft. H x 29 in. D, 41-in. D base, 45 RMU, 2,000 lb. load	
345209	15217-703
Adjustable QuadraRack, 19 in. W x 7 ft. H x 29.5 in. D to 35.4 in. D, 2,000 lb. load	
375571	15252-703
Adjustable rail QuadraRack, 19 in. W x 7 ft. H x 35.4 in. D to 41.3 in. D, 2,200 lb. load	

## Wall-Mount Systems

Anixter Part No.	Manufacturer Part No.
252823	11900-724
Cube-iT Plus wall-mount cabinet 24 in. W x 24 in. H x 24 in. D, plexiglass door	
261759	12419-724
Cube-iT Plus wall-mount cabinet 24 in. W x 24 in. H x 30 in. D, plexiglass door	
257839	11900-736
Cube-iT Plus wall-mount cabinet 24 in. W x 36 in. H x 24 in. D, plexiglass door	
275737	12419-736
Cube-iT Plus wall-mount cabinet 24 in. W x 36 in. H x 30 in. D, plexiglass door	
239729	11790-718
Standard swing-gate wall rack 19 in. W x 24.5 in. H x 18 in. D, 13 RMU, 100 lb. load capacity	
239731	11791-718
Standard swing-gate wall rack 19 in. W x 38.5 in. H x 18 in. D, 21 RMU, 100 lb. load capacity	
249531	11807-718
Standard swing-gate wall rack 19 in. W x 49 in. H x 18 in. D, 27 RMU, 100 lb. load capacity	
239703	11960-712
Fixed wall-mount equip. rack 19 in. W x 24.5 in. H x 12 in. D, 13 RMU, 200 lb. load capacity	

## Chatsworth Products, Inc. (CPI)

## Wall-Mount Systems (continued)

239705 11960-718

Fixed wall-mount equip. rack 19 in. W x 24.5 in. H x 18 in. D, 13 RMU, 200 lb. load capacity

239721 11961-712

Fixed wall-mount equip. rack 19 in. W x 38.5 in. H x 12 in. D, 21 RMU, 200 lb. load capacity

239722 11961-718

Fixed wall-mount equip. rack 19 in. W x 38.5 in. H x 18 in. D, 21 RMU, 200 lb. load capacity

## Vertical Cable Management

Anixter Part No.

Manufacturer Part No.

375567 35511-703

Evolution g1 single-sided vertical cable manager, 6 in. W x 7 ft. H x 13.2 in. D

375568 35514-703

Evolution g1 single-sided vertical cable manager, 12 in. W x 7 ft. H x 13.2 in. D

368557 35521-703

Evolution g2 double-sided vertical cable manager, 6 in. W x 7 ft. H x 24.5 in. D

368555 35524-703

Evolution g2 double-sided vertical cable manager, 12 in. W x 7 ft. H x 24.5 in. D

164160 11374-703

VCS vertical cabling section, single-sided, 6 in. W x 7 ft. H x 6.38 in. D

174142 11729-703

VCS vertical cabling section, double-sided, 6 in. W x 7 ft. H x 12.75 in. D

415456 13902-703

Velocity vertical cable manager, single-sided, for 7 ft. H (45U) racks,  
80.5 in. H x 6 in. W x 9.8 in. D, black

415457 13904-703

Velocity vertical cable manager, single-sided, for 7 ft. H (45U) racks,  
80.5 in. H x 10 in. W x 10.3 in. D, black

## Chatsworth Products, Inc. (CPI)

## Vertical Cable Management (continued)

415458 13912-703

Velocity vertical cable manager, double-sided, for 7 ft. H (45U) racks,  
80.5 in. H x 6 in. W x 16.6 in. D, black

415459 13914-703

Velocity vertical cable manager, double-sided, for 7 ft. H (45U) racks,  
80.5 in. H x 10 in. W x 17.5 in. D, black

## Horizontal Cable Management

Anixter Part No.

Manufacturer Part No.

256551 30139-719

Universal horizontal cable manager, single-sided, 19 in. W x 1 RMU x 4.96 in. D

247659 30130-719

Universal horizontal cable manager, single-sided, 19 in. W x 2 RMU x 5.14 in. D

247661 30131-719

Universal horizontal cable manager, single-sided, 19 in. W x 3 RMU x 5.14 in. D

375569 35441-701

Evolution horizontal cable manager, 19 in. EIA x 1 RMU x 8.2 in. D

368558 35441-702

Evolution horizontal cable manager, 19 in. EIA x 2 RMU x 8.2 in. D

375570 35441-703

Evolution horizontal cable manager, 19 in. EIA x 3 RMU x 8.2 in. D

420027 13930-701

Velocity horizontal cable manager, 1U x 19 in. W x 5.9 in. D, black

415483 13930-702

Velocity horizontal cable manager, 2U x 19 in. W x 5.9 in. D, black

420029 13930-703

Velocity horizontal cable manager, 3U x 19 in. W x 5.9 in. D, black

## CommScope SYSTIMAX Solutions

## UTP Cabling

Anixter Part No.	Manufacturer Part No.	Material ID
CMP-00424X10D-10B-06	2091B	760105338
GigaSPEED X10D, Category 6A, plenum, blue		
CM-00424X10D-10B-06	1091B	760105759
GigaSPEED X10D, Category 6A, nonplenum, blue		
CMP-00424AVA-7-06	2071E	700210081
GigaSPEED XL7, Category 6, plenum, light blue		
CM-00424AVA-7-06	1071E	700211956
GigaSPEED XL7, Category 6, nonplenum, blue		
CMP-00424MAX-6-06F	2061	760049585
PowerSUM, Category 5e, plenum, blue		
CM-00424MAX-6-06	1061	107057853
PowerSUM, Category 5e, nonplenum, light blue		

See color code on page 83.

## Information Outlets

Anixter Part No.	Manufacturer Part No.	Material ID
393219	MGS600-318	760092452
GigaSPEED X10D, 10 Gig module, blue		
246751	MGS400-318	700206758
GigaSPEED XL, Category 6 module, blue		
221202	MPS100E-318	108232778
PowerSUM, Category 5e module, blue		

## CommScope SYSTIMAX Solutions

## Faceplates

Anixter Part No.	Manufacturer Part No.	Material ID
197604	M12L-262	108168469
2-Port, single-gang, white		
197613	M14L-262	108168543
4-Port, single-gang, white		
197619	M16L-262	108168584
6-Port, single-gang, white		

## Patch Panels

Anixter Part No.	Manufacturer Part No.	Material ID
396747	360-1100GS5-24	760108894
24-Port 1100GS5 360 Gig patch panel		
389488	360-1100-GS3-24	760093419
24-Port 1100GS3 360 patch panel		
390250	360-1100-GS3-48	760093427
48-Port 1100GS3 360 patch panel		
529478	1100PSCAT5E-24	108208919
24-Port 1100 Category 5e patch panel		
389117	360-IP-UP-KIT-1100-24	760104992
iPatch upgrade kit for 24-port 1100GS3 360 patch panel		
390262	360-IP-UP-KIT-1100-48	760105015
iPatch upgrade kit for 48-port 1100GS3 360 patch panel		

## Patch Cords

Anixter Part No.	Manufacturer Part No.	Material ID
MM07-X10D360-06	CPCSSX2-02F007	CPCSSX2-02F007
GigaSPEED X10D 10 Gig patch cord, blue, 7 ft.		
MM07-AV7E-06	CPC3312-02F007	CPC3312-02F007
GigaSPEED XL Category 6 patch cord, blue, 7 ft.		
MM07-AV6-06	CPC6642-02F007	CPC6642-02F007
PowerSUM D8PS Category 5e patch cord, blue, 7 ft.		

## CommScope Uniprise Solutions

## UTP Cabling

Anixter Part No.	Manufacturer Part No.	Material ID
CMP-00424COME-7-06	6ECMP	4765804/10
UltraPipe, Category 6, enhanced, plenum, blue		
CM-00424COME-7-06	6ECMR	4662704/10
UltraPipe, Category 6, enhanced, nonplenum, blue		
CMP-00424COM-7-06	7504	4763204/10
UltraMedia, Category 6, enhanced, plenum, blue		
CM-00424COM-7-06	75N4	4662004/10
UltraMedia, Category 6, enhanced, nonplenum, blue		
CMP-00424CSP-7-06	6504 +	8748004/10
Media 6, Category 6, plenum, blue		
CM-00424CSP-7-06	65N4 +	8846904/10
Media 6, Category 6, nonplenum, blue		
CMP-00424COM-6-06	5504M	4196904/10
Ultra II, Category 5e "Plus," plenum, blue		
CM-00424COM-6-06	55N4R	4299704/10
Ultra II, Category 5e "Plus," nonplenum, blue		
CMP-00424COM-5-06F	5E55	4759004/10
DataPipe, Category 5e, plenum, blue		
CM-00424CMF-5-06	5EN5	4656904/10
DataPipe, Category 5e, nonplenum, blue		

See color code on page 83.

## Information Outlets

Anixter Part No.	Manufacturer Part No.	Material ID
279891	UNJ600-BL	CC0020917/1
Category 6 module, blue		
279901	UNJ500-BL	CC0021840/1
Category 5e module, blue		

## CommScope Uniprise Solutions

## Faceplates

Anixter Part No.	Manufacturer Part No.	Material ID
197604	M12L-262	108168469
2-Port, single-gang, white		
197613	M14L-262	108168543
4-Port, single-gang, white		
197619	M16L-262	108168584
6-Port, single-gang, white		

## Patch Panels

Anixter Part No.	Manufacturer Part No.	Material ID
331423	UNP610-24P	CC0057596/1
24-Port, Category 6		
331417	UNP510-24P	CC0057539/1
24-Port, Category 5e		

## Patch Cords

Anixter Part No.	Manufacturer Part No.	Material ID
MM07-COMC6-06	UNC6-BL-7F	CC0062547/1
Category 6 patch cord, blue, 7 ft.		
MM07-COMC5E-06	UNC5-BL-7F	CC0062786/1
Category 5e patch cord, blue, 7 ft.		

## Corning Cable Systems

### Outdoor Gel-Free Cables

Anixter Part No.	Manufacturer Part No.
372-COR62.5-LTD-XX	XXXKU4-T4130D20
ALTOS all-dielectric 62.5 $\mu$ m multimode	
372-COROM2-LTD-XX	XXXTU4-T4131D20
ALTOS all-dielectric 50 $\mu$ m multimode	
372-COROM3-LTD-XX	XXXTU4-T4180D20
ALTOS all-dielectric laser-optimized 50 $\mu$ m, 10 Gig Ethernet, 300 m distance	
372-COROM4-LTD-XX	XXXTU4-T4190D20
ALTOS all-dielectric laser-optimized 50 $\mu$ m, 10 Gig Ethernet, 550 m distance	
372-COR8.3-LTD-XX	XXXEU4-T4101D20
ALTOS all-dielectric single-mode	
372-COR62.5-LTA-XX	XXXKUC-T4130D20
ALTOS Lite single jacket, single armor 62.5 $\mu$ m multimode	
372-COROM2-LTA-XX	XXXTUC-T4131D20
ALTOS Lite single jacket, single armor 50 $\mu$ m multimode	
372-COR8.3-LTA-XX	XXXEUC-T4101D20
ALTOS Lite single jacket, single armor single-mode	

XX = Fiber Count

### Indoor/Outdoor Gel-Free Cables

Anixter Part No.	Manufacturer Part No.
373-COR62.5-LTD-XX	XXXKSF-T4130D20
FREEDM <sup>®</sup> LST riser-rated, 4 to 24 fiber, 62.5 $\mu$ m multimode	
373-COROM2-LTD-XX	XXXTSF-T4131D20
FREEDM LST riser-rated, 4 to 24 fiber, 50 $\mu$ m multimode	
373-COROM4-LTD-XX	XXXTSF-T4190D20
FREEDM LST riser-rated, 4 to 24 fiber, laser-optimized 50 $\mu$ m, 10 Gig Ethernet, 550 m distance	

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## Corning Cable Systems

### Indoor/Outdoor Gel-Free Cables (continued)

Anixter Part No.	Manufacturer Part No.
373-COR8.3-LTD-XX	XXXESF-T4101D20
FREEDM LST riser-rated, 4 to 24 fiber, single-mode	
373-COR62.5-LTD-XX	XXXKWF-T4130D20
FREEDM loose tube, 36 to 288 fiber, 62.5 $\mu$ m multimode	
373-COROM4-LTD-XX	XXXTWF-T4190D20
FREEDM loose tube, 36 to 288 fiber, laser-optimized 50 $\mu$ m, 10 Gig Ethernet, 550 m distance	
373-COR8.3-LTD-XX	XXXEFW-T4101D20
FREEDM loose tube, 36 to 288 fiber, single-mode	
373-COROM4-LTD-XX	XXXTSF-T4190D20
FREEDM One tight-buffered plenum laser-optimized 50 $\mu$ m, 10 Gig Ethernet, 550 m distance	
373-COR8.3-TBD-XX	XXXE8P-31131-29
FREEDM One tight-buffered plenum single-mode	
373-COR62.5-TBRD-XX	XXXK8F-31130-29
FREEDM One tight-buffered riser 62.5 $\mu$ m multimode	
373-COR8.3-TBRD-XX	XXXE8F-31131-29
FREEDM One tight-buffered riser single-mode	

XX = Fiber Count

### Indoor Cables

Anixter Part No.	Manufacturer Part No.
370-947-FDDI-XX	XXXK81-31130-24
MIC riser, 2 to 24 fiber, 62.5 $\mu$ m multimode	
371-COROM2-TBD-XX	XXXT81-31131-24
MIC riser, 2 to 24 fiber, 50 $\mu$ m multimode	
371-COROM3-TBD-XX	XXXT81-31180-24
MIC riser, 2 to 24 fiber, laser-optimized 50 $\mu$ m, 10 Gig Ethernet, 300 m distance	

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## Corning Cable Systems

### Indoor Cables (continued)

Anixter Part No.	Manufacturer Part No.
370-947-SMODE-XX	XXXE81-31131-24
MIC riser, 2 to 24 fiber, single-mode	
370-947-FDDI-XX	XXXK81-61130-24
MIC unitized riser, 36 to 144 fiber, 62.5 $\mu$ m multimode	
371-COROM2-TBD-XX	XXXT81-61131-24
MIC unitized riser, 36 to 144 fiber, 50 $\mu$ m multimode	
370-947-SMODE-XX	XXXE81-61131-24
MIC unitized riser, 36 to 144 fiber, single-mode	
370-949-FDDI-XX	XXXK88-31130-29
MIC plenum, 2 to 24 fiber, 62.5 $\mu$ m multimode	
370-COROM2-TBD-XX	XXXT88-31131-29
MIC plenum, 2 to 24 fiber, 50 $\mu$ m multimode	
370-COROM3-TBD-XX	XXXT88-31180-29
MIC plenum, 2 to 24 fiber, laser to optimized 50 $\mu$ m, 10 Gig Ethernet, 300 m distance	
370-COROM4-TBD-XX	XXXT88-31190-29
MIC plenum, 2 to 24 fiber, laser to optimized 50 $\mu$ m, 10 Gig Ethernet, 500 m distance	
370-948-SMODE-XX	XXXE88-31131-29
MIC plenum, 2 to 24 fiber, single to mode	
370-949-FDDI-XX	XXXK88-61130-29
MIC unitized plenum, 36 to 144 fiber, 62.5 $\mu$ m multimode	
370-COROM2-TBD-XX	XXXT88-61131-29
MIC unitized plenum, 36 to 144 fiber, 50 $\mu$ m multimode	
370-COROM3-TBD-XX	XXXT88-61180-29
MIC unitized plenum, 36 to 144 fiber, laser-optimized 50 $\mu$ m, 10 Gig Ethernet, 300 m distance	
370-948-SMODE-XX	XXXE88-61131-29
MIC unitized plenum, 36 to 144 fiber, single-mode	

XX = Fiber Count

## Corning Cable Systems

### Buffer Tube Fan-Out Kits

Anixter Part No.	Manufacturer Part No.
152285	FAN-BT25-06
Indoor 25 in. L, six fibers per tube	
152286	FAN-BT25-12
Indoor 25 in. L, 12 fibers per tube	

### UniCam Pretium Performance Connectors

Anixter Part No.	Manufacturer Part No.
347845	TKT-UNICAM-PFC
UniCam connector installation tool kit	
338911	95-050-99-X
LC, laser-optimized 50 $\mu\text{m}$ multimode	
338910	95-050-99
LC, 50 $\mu\text{m}$ multimode	
338909	95-000-99
LC, 62.5 $\mu\text{m}$ multimode	
338908	95-200-99
LC, single-mode UPC polish	
338903	95-050-41-X
SC, laser-optimized 50 $\mu\text{m}$ multimode	
338904	95-050-41
SC, 50 $\mu\text{m}$ multimode	
338894	95-000-41
SC, 62.5 $\mu\text{m}$ multimode	
338895	95-200-41
SC, single-mode SPC polish	
338913	95-200-42
SC, single-mode UPC polish	

## Corning Cable Systems

### Pretium Connector Housings

Anixter Part No.	Manufacturer Part No.
268733	PCH-01U
1U tall, accepts up to two CCH connector panels	
330226	PCH-M3-01U
1U tall, accepts up to three CCH connector panels	
330206	PCH-02U
2U tall, accepts up to four CCH connector panels	
268734	PCH-04U
4U tall, accepts up to 12 CCH connector panels	

### Single-Panel Housing

Anixter Part No.	Manufacturer Part No.
313351	SPH-01P
Accepts one CCH panel or module	

### Closet-Connector Housing Panels, 12 Fiber

Anixter Part No.	Manufacturer Part No.
272048	CCH-CP12-E4
12-Fiber LC duplex, laser-optimized 50 $\mu$ m multimode	
250692	CCH-CP12-D3
12-Fiber LC duplex, 50 $\mu$ m multimode	
272046	CCH-CP12-A8
12-Fiber LC duplex, 62.5 $\mu$ m multimode	
242436	CCH-CP12-A9
12-Fiber LC duplex, single-mode UPC polish	
255257	CCH-CP12-E7
12-Fiber SC duplex, laser-optimized 50 $\mu$ m multimode	
250688	CCH-CP12-G7
12-Fiber SC, 50 $\mu$ m multimode	

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## Corning Cable Systems

### Closet-connector Housing Panels, 12 Fiber (continued)

Anixter Part No.	Manufacturer Part No.
180729	CCH-CP12-91
12-Fiber SC, 62.5 $\mu$ m multimode	
180728	CCH-CP12-59
12-Fiber SC, single-mode UPC polish	

### Splice and Test Equipment

Anixter Part No.	Manufacturer Part No.
329728	1000DK-MDSD
OV-1000 Optical Time Domain Reflectometer (OTDR)	
370269	OTS-6MDSD
OTS-600 Series intelligent test kit	
308987	LTK-4MDSD
LTK-400 Series handheld loss test kit	
251702	VFL-350
VFL-350 Visual Fault Locator	
373650	M90E-OSM-T-H
OptiSplice CDS Fusion Splicer	
382718	CCS PN OSCDS-OSM-T-H
OptiSplice M90e Fusion Splicer	
370438	OS1-OSM-T-H
OptiSplice One handheld fusion splicer	
129467	95-000-04
CamSplice no-adhesive mechanical splice	
086541	FBC-001
Score and snap cleaver	

## Fluke Networks

### Copper and Fiber Certification

Anixter Part No.	Manufacturer Part No.
280602	DTX-1800
900 MHz with 9-second Cat 6 autotest, includes smart remote, permanent link and channel adapters, MMC card, USB port	
280630	DTX-1800-M 120
DTX-1800 CableAnalyzer with multimode DTX fiber modules	
280631	DTX-1800-MS 120
DTX-1800 CableAnalyzer with multimode and single-mode DTX fiber modules	
348996	DTX-1800-MSO
Complete DTX-1800 copper/fiber certification kit	
348998	DTX-OTDR-KIT
DTX compact OTDR kit	
348999	DTX-OTDR/LL-KIT
Complete DTX fiber certification add-on kit	

### Tools

Anixter Part No.	Manufacturer Part No.
263611	11293000
Pro-Tool Kit IS60 with D914S impact tool, 66/110 EverSharp combo blade, cable stripper, D-Snips, Maglite and Sharpie	
328188	JR-SYS-2
JackRapid termination tool for CommScope SYSTIMAX Solutions MGS400, MGS500, MFP420 and MFP520	
314164	JR-SYS-UNI-1
JackRapid termination tool for CommScope Uniprise Solutions MPS100E, C5, M1BH and UNJ600/500/300	
366266	JR-ORT-2
JackRapid termination tool for Ortronics TJ5E00, TJ600 and TJ610	
393567	JR-PAN-2
JackRapid termination tool for PANDUIT NK688M and NKP5E88M	

## PANDUIT

## UTP Cabling

Anixter Part No.	Manufacturer Part No.
CMP-00423PND-6A-06	PUP6A04BU-UG
TX6A, 10 Gig, plenum, blue	
CM-00423PND-6A-06	PUP6A04BU-UG
TX6A, 10 Gig, nonplenum, blue	
CMP-00424PND-7RB-06	PUP6004BU-UY
TX6000, Category 6, plenum, blue	
CM-00424PND-7RB-06	PUR6004BU-UY
TX6000, Category 6, nonplenum, blue	
CMP-00424PND-6U-06	PUP5504BU-UY
TX5500, Category 5e, plenum, blue	
CM-00424PND-6U-06	PUR5504BU-UY
TX5500, Category 5e, nonplenum, blue	

See color code on page 83.

## Information Outlets

Anixter Part No.	Manufacturer Part No.
307322	CJ6X88TGBU
Mini-Com TX6A 10 Gig module, blue	
311321	CJ688TGBU
Mini-Com TX6 PLUS Category 6 module, blue	
311332	CJ5E88TGBU
Mini-Com TX5e module Category 5e, blue	

## Faceplates

Anixter Part No.	Manufacturer Part No.
234233	CFPL2IWY
2-Port, single-gang, off white	
222194	CFPL4IWY
4-Port, single-gang, off white	

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## PANDUIT

## Faceplates (continued)

Anixter Part No.	Manufacturer Part No.
222195	CFPL6IWY
6-Port, single-gang, off white	

## Patch Panels

Anixter Part No.	Manufacturer Part No.
307300	DP246X88TGY
24-Port DP6 10 Gig	
311398	DP24688TGY
24-Port DP6 PLUS Category 6	
311403	DP245E88TGY
24-Port DP5e Category 5e	
175037	CPP24WBLY
24-Port modular faceplate	

## Patch Cords

Anixter Part No.	Manufacturer Part No.
MM07-PA6A-06	UTP6A7BU
TX6A 10 Gig, 7 ft.	
MM07-PA7P-06	UTPSP7BUY
TX6 PLUS Category 6, 7 ft.	
MM07-PA6-06	UTPCH7BUY
TX5e Category 5e, 7 ft.	

## Self-Laminating Wire Marker Dispensers

Anixter Part No.	Manufacturer Part No.
313875	S100X125VARY
Self-lam dispenser kit with pen, white vinyl, 1 in. W x 1.25 in. H	
313877	S100X125VAFY
Refill roll for dispenser, white vinyl, 1 in. W x 1.25 in. H, 200/roll	



## PANDUIT

## Tak-Tape Hook &amp; Loop Rolls

Anixter Part No.	Manufacturer Part No.
262715	TTS-20R0
20 Ft. roll	
262716	TTS-35RX0
10 Pack of 35 ft. rolls	

## Tak-Ty Hook &amp; Loop Cable Ties

Anixter Part No.	Manufacturer Part No.
167686	HLT2I-X0
Loop ties, slot, black, 8 in., 10/pk	
167689	HLT3I-X0
Loop ties, slot, black, 12 in., 10/pk	
167683	HLS1.5S-X0
Strip ties, perforated, black, 6 in., 10/pk	
167684	HLS3S-X0
Strip ties, perforated, black, 12 in., 10/pk	
216722	HLM-15R0
15-ft. roll, cut to length, black, 0.75 in.	
167690	HLS-15R0
15-ft. roll, cut to length, black, 0.33 in.	
200473	HLS-75R0
75-ft. roll, cut to length, black, 0.75 in.	

## Pan-Ty Cable Ties

Anixter Part No.	Manufacturer Part No.
104668	PLT1M-C
Miniature 0.87 in. cross-section, natural, 3.9 in., 100/pk	
104679	PLT2M-C
Miniature 2 in. cross-section, natural, 8 in., 100/pk	

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## PANDUIT

## Pan-Ty Cable Ties (continued)

Anixter Part No.	Manufacturer Part No.
104683	PLT2I-C
Intermediate 2 in. cross-section, natural, 8 in., 100/pk	
104913	PLT3I-C
Intermediate 3 in. cross-section, natural, 11.4 in., 100/pk	
283460	PLT4I-C
Intermediate 4 in. cross-section, natural, 14.5 in., 100/pk	
104675	PLT2S-C
Standard 1.88 in. cross-section, natural, 7.4 in., 100/pk	
104686	PLT3S-C
Standard 3 in. cross-section, natural, 11.5 in., 100/pk	
104688	PLT4S-C
Standard 4 in. cross-section, natural, 14.5 in., 100/pk	

## Thermal Transfer Printers and Accessories

Anixter Part No.	Manufacturer Part No.
348455	LS9
COUGAR LS9 printer, tape cassette, batteries	
325933	T050X000VPC-BK
LS8/LS9 vinyl tape cassette, white/black, 0.5 in. W x 25 ft. L	
325934	T100X000VPC-BK
LS8/LS9 vinyl tape cassette, white/black, 1 in. W x 25 ft. L	

## J-Pro Cable Support System

Anixter Part No.	Manufacturer Part No.
324712	JP75W-L20
3/4-in. J-hook for wall-mount applications	
324714	JP75DW-L20
3/4-in. J-hook for drop wire and threaded rod clip	

## Manufacturers Trademarks

ALTOS is a registered trademark of Corning Cable Systems  
 AngleFlex is a trademark of Belden  
 CableAnalyzer is a trademark of Fluke Networks  
 CamSplice is a trademark of Corning Cable Systems  
 Clarity is a trademark of Legrand/Ortronics  
 COUGAR is a trademark of PANDUIT  
 Cube IT Plus is a trademark of Chatsworth Products, Inc. (CPI)  
 DataPipe is a registered trademark of CommScope Uniprise Solutions  
 DataTwist is a trademark of Belden  
 DP5e is a trademark of PANDUIT  
 DP6 is a trademark of PANDUIT  
 EverSharp is a trademark of Fluke Networks  
 Evolution is a trademark of Chatsworth Products, Inc. (CPI)  
 FREEDM is a registered trademark of Corning Cable Systems  
 GigaSPEED is a registered trademark of CommScope SYSTIMAX Solutions  
 Hyper Plus is a trademark of Berk-Tek/Ortronics  
 iPatch is a registered trademark of CommScope SYSTIMAX Solutions  
 JackRapid is a trademark of Fluke Networks  
 J-Pro is a trademark of PANDUIT  
 KeyConnect is a trademark of Belden  
 LANmark is a trademark of Berk-Tek/Ortronics  
 Media 6 is a registered trademark of CommScope Uniprise Solutions  
 MediaTwist is a registered trademark of Belden  
 Mighty Mo is a registered trademark of Legrand/Ortronics  
 Mini-Com is a registered trademark of PANDUIT  
 OptiSplice is a trademark of Corning Cable Systems  
 Pan-Ty is a registered trademark of PANDUIT  
 PowerSUM is a registered trademark of CommScope SYSTIMAX Solutions  
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