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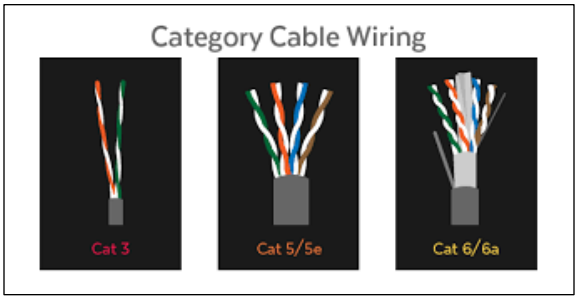
Connections

New England Drives & Controls, Inc.

It's Just Wire!

Last week I met Sandy Fulton, Turck's Cable Design and procurement manager, affectionately known to her peers as the "Cable Lady." The one thing I walked away relaizing after hearing her talk, was that as much as you think something is quite obvious, there are always many layers beneath the surface! Her introductory line was that Turck used over 25 million meters of cable last year. That is 15,500 miles of cable. That is enough to stretch from New York City to Los Angeles, 5 ½ times. I had no idea how much more interesting it could get. Sandy enlightened me. My days of attaching two connectors to a length of wire and calling it good, were over. Sandy drilled the following into my cable consciousness; Choosing the right cable was simple if you follow the "3 A's," Application, Attributes, and Approvals. As you can see, Sandy is also a master of alliteration. So let's talk cable. At first it was the difference between categories in Ethernet cable. Did you know that all twisted pairs in an Ethernet cable were twisted at different lengths? The tighter the twists are, the higher category rating.



Find a cable around you. No really. Grab the first cable you see. It may be a network patch cord, or a sensor cable connected to a M12 connector, or the power cord to a lamp. You get the idea.

There should be some writing on the cable jacket. That is what we are looking for. You may see the manufacturer name or code written on it as well as any standards or listings that it is rated for. You may see the letters CMR which indicate it is microbial resistant. The gauge of the conductors should be listed. It may carry the UL (Underwriters Laboratory) Logo or the letters CSA indicating it is listed by the Canadian Standards Association. It may have a the letters CMP, indicating it can be installed in wall or through the plenum between the ceiling and the floor above you. It will indicate the maximum voltage ratings it can safely handle, perhaps for both AC and DC. It will also state the current carrying capability of the cable.

"Life is really simple, but we insist on making it complicated."

-Confucius

As New England Drives & Controls constantly strives to become a better asset to our customers, our whitepaper series will feature new technologies or helpful insights that may be pertinent to the reader. It is our sincere hope that this information will be beneficial in both relating, and applying content to your industrial needs.

We hope you find this whitepaper series an enjoyable and informative read.

We always welcome your questions and comments.

Function	PVC	FRNC	TPE	PUR
Oil Resistance	**	**	***	***
Abrasion Resistance	**	*	***	****
Continuous Flex	**	*	****	****
Specific Attributes	General purpose, good mechanical strength	Flame retardant, low smoke when burned	Excellent for flexing applications and very good resistance to oils and coolants	Outstanding resistance to abrasion, high flex and high tolerance to solvents
Cost of Installation	$	$$	$$$	$$$
Type of Application	Permanent Installation Moderate Flexing	Permanent Installation Moderate Flexing	Continuous Flexing	Moderate Flexing Continuous Flexing

The material that the insulating jacket is made of will be listed. You may find it to be PVC, PUR, FRNC, or TPE. It may also indicate that it is Oil Resistant as is the case with PVC. The temperature range may be listed, both min and max.

How about flame rating? To receive an FT4 rating, 70,000 BTUs from a 10" ribbon burner are applied to bundled cables in a vertical orientation. Other markings indicate if the cable can be directly buried, or submerged. It may have MS40 as a marking indicating it is for Marine/Shipboard applications. It may have the UL ITCERDB, CSA ACIC or HL ABCD markings indicating that it is armored. This would make it suitable for Class 1 Div 2 applications. The HL designator indicates it can be suitable in a hazardous location Class 1 Div 1.

TURCK has just introduced a new cable type called "extremelife^{TM} 60." It stays flexible even at -40^{o}C. It carries the FT4 Flame Retardant rating. It is UV resistant and passed both the UL 720 hour and CSA 1000 hour tests. It is Oil Resistant and carries UL. (Oil Res I and II)

It is flexible, crush, impact and abrasion resistant. In an exposed run it carries the same ratings as metal clad armored cable, but without the metal armor. It is also compliant with IEC 60332-3-22 flame tests to support ATEX. This means that it passes the70,000 BTU vertical ribbon test listed above for 40 minutes! As you can see, selecting the right cable is not always as straight forward as one might think, Especially when an application is truly done properly. The 3 A's should always be considered; What is the application? What are the attributes? (temperature, environment, chemical exposure, fixed or moving, electrical and shielding requirements) What agency approvals are required?

For help with these questions, contact your friendly New England Drives & Controls representative.

-Peter Lavoie (Engineering Manager)

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