

## Smarter terminations





Exploring the benefits of preterminated cable assemblies including speed and cost When installing network cabling, the challenge can be meeting deadline pressures such as minimal installation time, out of hours working, strict access controls, storage or sometimes the available skill set to terminate and test on-site. This applies to copper cabling installations, and even more so when installing fibre cabling.

Fibre in enterprise installations, and particularly in data centres, is now a much greater part of network cabling than it used to be. However, fibre termination in the field requires additional skill sets, longer termination time, a clean environment and additional specialist termination and test equipment requiring an additional, and sometimes significant, investment over and above what's used for copper system termination.

## Pre-terminated assemblies

A solution is factory terminated pre-terminated assemblies, which are growing in popularity and where each cable is terminated in a controlled environment ensuring optimum performance before being delivered to the site. This significantly reduces installation and labour costs by up to 75% compared to field termination methods. Pre-terminated solutions are factory tested and typically have test results that are either supplied with each assembly or can be accessed online.

An excess of packaging materials is something that installers have long battled with. Many end-users, and particularly data centres, have been at the forefront in terms of ensuring reduced packaging because their environmental policies are quite rightly designed to reduce packaging waste and prevent it from being delivered to the site. With Pre-terminated systems, the waste being delivered to site is reduced by up to 80% because there's less packaging and no termination scrap material or debris to dispose of.

It's also fair to say that using a pre-terminated system, or even just an individual pre-terminated fibre cable within a conventional field terminated system, requires more forward planning. Knowing in advance what cable lengths are required for each pre-term location and the connector or cable type required is vital. When installing copper in an existing system that's being added to will almost certainly



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be RJ45-based, unless it's old, and a category cabling system will be backward compatible. For fibre, the cable needed could be multimode or singlemode with the many different fibre connector variants that have been produced over the years and could already be in place in existing patch panels meaning that the pre-term will need the same connector type. When installing a fibre pre-term, the cable type needs to be clearly defined beforehand particularly when adding to an existing site. Over the years I have lost count of the number of occasions a fibre connector or pre-term cable assembly has been bought only for the engineers to get to the site and find something different.

The application for pre-terms should also be understood as armoured cable pre-terms are recommended when rodent protection is an issue. Ruggedised assemblies which provide greater crush resistance are more suitable for long line cable lengths or cabinet to cabinet applications.

## MPO pre-terminated assemblies

MPO fibre pre-terms have been an issue for many over the years. The polarity on MPO assemblies (key up or key down) needs to be correct, but it doesn't end with that. There has been much confusion in the market surrounding the correct wiring for 24 position MPO Trunk Pre-Term Assemblies because there was no industry standard.

The previous TIA-568-C3 standard only gave the wiring for 12 position MPO's, so when 24 position versions appeared cable assembly manufacturers came up with their own specifications for what they thought the additional wiring should be and gave them non-industry standard designations such as straight or cross etc. This resulted in 24-way pre-term assemblies from different sources not being compatible and causing a great deal of confusion.

The TIA 568.3-D standard has since clarified the wiring for MPO/MTP assemblies ensuring that assemblies manufactured to this specification are compatible. However, we do still see installations that are not to the standard which can cause issues when additional pre-terminated cables are installed.

Constructors Product Regulations (CPR) should also be considered when installing pre-terminated systems, whether it's a leading manufacturer's standard assembly or an individual pre-term manufactured by an assembly house. CPR specifies how quickly a cable reacts to fire in terms of how quickly fire spreads, heat is released, smoke production, acid gas production and flaming droplets, putting it into cable classes.

There's still an alarming lack of knowledge on this subject, particularly among some smaller installers and distributors/ wholesalers who are not specialists in the networking market. But the simple fact of the matter is that BS6701 states that as a minimum CPR cable class Cca should be used in permanent link applications due to high flame resistance. It will be argued by some that long line pre-terms or other pre-terms are not a permanent link because they can be disconnected. However, they are typically long cable lengths running through a building just like a permanent link so whatever your view on that, it makes good and safer sense to specify CPR Cca cable as a minimum in pre-terminated assemblies.

Factory terminated cable assemblies, therefore, provide clear speed of installation and implementation advantages coupled with reduced on-site installation costs when compared to field terminated systems. However, as can be seen from the above, there's still much that should be considered to take advantage of the benefits they bring.