

Technical Note

The Danger of Overstating Mating Cycles



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Overview

Structured Cabling is all about numbers. Some vendors believe that a bigger number is better and that quoting a larger number than their competitors will give them the edge. Unfortunately this practice can be misleading for end-users who may not possess all of the relevant facts to make an informed decision.

One such practice is to quote the number of mating cycles (insertions and withdrawals) for modular plugs and jacks that is higher than the requirements of the Standards.

Excel has carried out aged life testing on all our products, including mating cycles, well in excess of the required number in the current standard, without any significant degradation of performance. We do not overstate our performance unnecessarily for a number of reasons as discussed below.

Standards Requirements

EN 50173-1:2011 refers to EN60603-7 as the standard for free and fixed connectors (modular plugs and jacks) however it goes on in Clause D to outline the expected life-cycle of these components. The following text and table is quite clear in its understanding

'The number of mating cycles (insertions and withdrawals) for free and fixed connectors (modular plugs and jacks), and the number of conductor re-terminations per solderless connection shall comply with the specifications in Table D.34.'

Table D.34 - Free and fixed connectors (modular plugs and jacks) operations matrix

Connecting hardware type	Insertion and withdrawal, and conductor re-termination, operations	Minimum number of operations
Free connector (modular plug)	Insertion/withdrawal with fixed connector (modular socket)	750
	Cable re-termination	0
Fixed connector (modular jack)	Insertion/withdrawal with free connector (modular plug)	750
	Cable re-termination	20 ^{a,b}

^a Unless not intended for re-termination, in which case this value equals 0.

^b The range of conductor size and type shall be in accordance with the manufacturer's instructions.

For clarification of the table above, Cable re-termination relates to how many times a plug or a jack can be re-terminated. Point 'a' means if you get it wrong throw it away, Point 'b' means use in accordance with the Manufacturer guidelines.

From this the current standard stipulates a minimum of 750 operations.

Some vendors are now stating far higher numbers than the 750, however we believe this to be quite misleading.

ALL Standards bodies are actually looking to REDUCE the number of mating cycles and the majority of leading manufacturers are currently part of this initiative

The main reason for this is POE and the higher power POE+. A series of recent studies have shown that if POE+ is not disabled prior to a plug being de-mated then 600mA per pair will create a small electric surge/arc across just one of the pins. Each time this occurs it causes a small amount of damage in the 'wiping area' (the point of contact prior to full mating) over time this damage will spread and potentially affect the whole contact area.

The current discussions are quoting numbers as low as 200 if POE+ is energised, therefore telling an end-user they could have over 1,000 mating cycles could be very misleading indeed.

The second major reason, relates to the compatibility. To be able to quote an increased number of mating cycles in this way, then that Manufacturer, MUST be in control of all the components in the Channel and even with the best efforts this is not always possible.

With the best will in the world it will prove almost impossible to keep the installation 'Sterile'. During the life of the installation, if not on day-one, a Patch / Equipment Lead not made by the manufacturer of the jack/outlet will be introduced, as soon as that happens the mating cycles can only be calculated by using the Standards.

Conclusion

We trust this clarifies the situation. Excel Networking is a contributor to the development of a number of the Standards discussed in this document. We are very proud of the extent of our Independent Component Compliance Testing, which means our products meet or exceed both the Channel and Component Standards.

We do not believe in overstating the performance of any component in a way that could be misconstrued by a user.

This Technical Note has been produced by Paul Cave, Technical Manager – Infrastructure, on behalf of Excel

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