IEEE 802.3 Ethernet Working Group
Liaison Communication

Source:	IEEE 802.3 Working Group[1]	
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Subject: Power Delivery over Communications Cabling

Dear Mr. Emplit,

We are concerned that the 2017 National Electrical Code® revisions in Table 725.144 have effectively created a “new” class of communication cables for operating temperatures greater than 60°C with designated ampacity limits for powering, without consideration for the transmission characteristics related to the application usage.

At this time, no known IEEE 802.3 communications and/or power delivery have been specified for operation on data center or enterprise Ethernet based communications circuits at 90°C conductor temperature. IEEE 802.3 references TIA and ISO/IEC cabling functionally specified over the temperature range from -10°C to +60°C. Cabling transmission characteristics beyond 60°C are not specified, therefore 802.3 operation may not be supported. This is independent of whether the cabling itself may survive exposure to such temperatures.

[1] This document solely represents the views of the IEEE 802.3 Working Group, and does not necessarily represent a position of the IEEE, the IEEE Standards Association, or IEEE 802.

TABLE 725.144, Ampacities of Each Conductor (in Amperes) in a 4-Pair Class 2 or Class 3 Data Cable, Based on Copper Conductors at Ambient Temperature of 30°C (86°F) with All Conductors in All Cables Carrying Current, 60°C (140°F), 75°C (167°F) and 90°C (194°F) Rated Cables

AWG	Numberof 4-Pair Cables in a Bundle																				
	1			2-7			8-19			20-37			38-61			62-91			92-192		
	Temp Rating			Temp Rating			Temp Rating			Temp Rating			Temp Rating			Temp Rating			Temp Rating		
	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	90°C	60°C	75°C	90°C
26	1.0	1.0	1.0	1.0	1.0	1.0	0.7	0.8	1.0	0.5	0.6	0.7	0.4	0.5	0.6	0.4	0.5	0.6	NA	NA	NA
24	2.0	2.0	2.0	1.0	1.4	1.6	0.8	1.0	1.1	0.6	0.7	0.9	0.5	0.6	0.7	0.4	0.5	0.6	0.3	0.4	0.5
23	2.5	2.5	2.5	1.2	1.5	1.7	0.8	1.1	1.2	0.6	0.8	0.9	0.5	0.7	0.8	0.5	0.7	0.8	0.4	0.5	0.6
22	3.0	3.0	3.0	1.4	1.8	2.1	1.0	1.2	1.4	0.7	0.9	1.1	0.6	0.8	0.9	0.6	0.7	0.8	0.5	0.6	0.7

Note 1: For bundle sizes over 192 cables, or for conductor sizes smaller than 26 AWG, ampacities shall be permitted to be determined by qualified personnel under engineering supervision. ***Note 2:*** *Where only half of the conductors in each cable are carrying current, the values in the table shall be permitted to be increased by a factor of 1.4.* ***Informational Note:*** *The conductor size in data cables in widespread use are typically 22-26 AWG.*

Table 725.144 in the 2017 National Electrical Code® revision may apply to communication cables carrying power and data with the implication of applicability to balanced twisted pair structured cabling. IEEE 802.3 would appreciate TIA TR-42's assistance in addressing the implications of the 2017 National Electrical Code® revision.

Sincerely,

David Law

Chair, IEEE 802.3 Ethernet Working Group