

Hitachi Cable America Inc.

Understand & Using the New 2017 NEC Ampacity Table

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The new ampacity table in the upcoming 2017 National Electrical Code is of great benefit for users and installers of premise cables who intend to carry power for the connected devices. The table clarifies and simplifies the process of choosing a cable suitable for carrying such power to devices, making it a simple 'lookup' task.

The table below is representative of the one approved the National Fire Protection Agency for use in the next edition of the National Electrical Code known as NFPA-70. The complete table will be found in section 725.144 of the code. It will also be referenced in Article 800 Communication Circuits. The table identifies the ampacity of each conductor (in Amperes) in a 4-pair Class 2 or Class 3 data cable. Ambient temperature used for development of the table is 30°C (86° F) with all conductors in all cables carrying current. The table is based on 60°C (140°F), 75°C (167°F) and 90°C (194°F) rated cables.

AWG	Number of 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					
	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
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	0.1	0.1	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

The POE standards permit power voltages of approximately 50 Volts and the higher power standards use all four pairs to provide that power. For the upcoming Type 3 and 4 POE standards from the IEEE, the following cable ampacities are required.

Type 3	60 Watts	0.3 Amps per conductor
Type 4	100 Watts	0.5 Amps per conductor

Importantly, to support the highest power specification under development by the IEEE, a rating of 0.5 amps will provide that capability. Within the table, selecting ampacities from the 92-192 bundle size provides a 'worst case' design criteria. There will also be a note regarding bundles over 192 cables that will allow the ampacity to be determined by qualified personnel under engineering supervision.

Hitachi Cable America's cables rated Category 6 and higher that are of 23 gage construction or larger and rated at 75°C will provide 0.5 Ampere capability. These cables are then inherently capable of supporting a 100W POE system within large bundles and no separate 'LP' rating is required to be compliant to the electrical code. There may be future standards or proprietary systems that offer additional power handling capability. Examples of this may include:

120 Watts	0.6 Amps per conductor
140 Watts	0.7 Amps per conductor

To support such higher power ratings, there are several ways to gain that ampacity rating:

1. Reduce the bundle size such that the ampacity rating is sufficient for the anticipated power load.
2. If half of the cables in a bundle are to carry power, then the ampacity in the table can be increased by 40%. For example, a cable rated 0.5A (100Watts), that same cable in this situation could be able to carry up to 0.7A (140Watts). This 40% increase in amp rating applies to any cable type or bundle size in the table.
3. For cables specifically designed for increased power loads or higher temperature ratings, an 'LP' rating is available through a UL listing, but again is not required by national electrical code.