Conductor Ampacity
(Amperage Capacity)

Current Ratings of Electrical Wire & Cable

Based on Table 310.16 of the 2008 edition of the National Electrical Code, with explanations.

When you look at Table 310.16 in the N.E.C. (National Electrical Code), The ratings I have shown in my table, do **NOT** correspond with what you will find in the aforementioned Table. For Example, THHN conductors are shown in the 90°C column. This is the starting point for calculating the current carrying capabilities of a THHN conductor. You have to reduce its ampacity based on the temperature of its environment, & based on how many conductors are in the raceway. In the process of conducting current, heat is generated. The conductors in a pipe or raceway give off heat, and the greater the number of conductors, the more difficult it is for them to dissipate heat. For example: Conductors in a conduit in the basement of a single family dwelling, probably would have no difficulty dissipating any heat generated. Conductors in a conduit, or a roof in the blazing heat of a summer sun on the hottest day of the year, would find it hard to dissipate heat, and you have to limit the load imposed upon them. Similarly, running raceways through lower temperature areas increase their current carrying capabilities. The process of applying correction factors is called “De-rating”.

Although Type NM-B cable (Romex ®) contains 90°C conductors, Article 334.80 limits its Ampacity to the 60°C level. I have this shown in the chart below. UF (Underground Feeder) cable is also shown in the 60°C column.

Type THHN insulated conductors are shown in the chart in the 90°C column, but cannot be used at that level, and they are to be protected based on their 75°C rating. The terminal ratings of devices (Switches, outlets, circuit breakers, etc) are usually limited to 75°C, and may be damaged if subjected to the higher temperatures. TW is an older insulation type.

A brief explanation of the more common insulation types:

TW	**T**hermoplastic, **W**ater resistant
THW	**T**hermoplastic, **H**eat resistant, **W**ater resistant
THHN	**T**hermoplastic, **H**igh **H**eat resistant, **N**ylon Jacketed
THWN	**T**hermoplastic, **H**eat resistant, **W**ater resistant **N**ylon Jacketed
RHW	**R**ubber jacketed, **H**eat resistant, **W**ater resistant

Table 310.16 in the N.E.C. gives higher ampacities than shown in the table that follows. The higher ratings are the starting point for de-rating factors. This is especially true for 14,12, & 10 A.W.G. (American Wire Gage) sizes. Article 240.4(D)(3), (5) & (7) limits those sizes to the values shown in the table that follows.

Allowable Ampacities of Insulated Conductors Rated 0 Through 2000 Volts, 60°C Through 90°C, Not More Than Three Current-Carrying Conductors in Raceway, Cable, or Earth, Based on Ambient Temperature of 30°C (86°F)

These are the **MAXIMUM** ratings allowed, and you may have to reduce them further based upon the number of conductors in the raceway, and the ambient temperature. This table is for the convenience of the casual user, and if you are uncertain as to your situation, consult a local professional.

	Temperature Rating of **COPPER** Conductors	
	60°C (140°F)	75°C (167°F)
	NM Cable (Romex ®)	THHN
		THW, THHW
Wire	UF Cable	THWN, RHW
Size	TW	XHHW, USE
14	15	15
12	20	20
10	30	30
8	40	50
6	55	65
4	70	85
3	85	100
2	95	115
1	110	130
1/0	125	150
2/0	145	175
3/0	165	200
4/0	195	230