



***Building a Safer Idaho***

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**Ambient Temperature Corrections of SER  
and NM Cable in Residential Attics**

The National Electrical Code requires wire ampacity to be adjusted due to ambient temperature factors. There is no set temperature or standards that tell us exactly how to find the ambient temperature in an attic, so this makes it hard if not impossible to know what ambient temperature correction factor to apply to SER or NM Cable that is ran through or in an attic.

If we take a standard 4/0 aluminum SER cable, terminated on 75°f terminals, it is good for 180 amps. In certain dwelling applications, for services rated 100 amps through 400 amps, it shall be permitted to have an ampacity on the service conductors and feeders of not less than 83%. On a 200 amp service this would make the required minimum ampacity of service conductors 166 amps.

Let's apply ambient temperature corrections on 4/0 aluminum from the 90°f column of table 310.15(B)(16) starting at 205 amps. If we use the average high in Boise as an example, at 91°f (because Boise is stinking hot) + 30°f (the average rise of an attic above ambient) it gives us 121°f. In table 310.15(B)(2)(a) we have to take .82 and multiply it by 205 which gives us 168 amps. This is two amps over the minimum required ampacity of the service conductors in question.

Applying this to NM cable we come up with the following results. Section 334.80 allows us to apply ambient temperature corrections from the 90°f column of 310.15(B)(16)

#14 NM cable in an attic that is 149° F is still good for 16.25 amps  
#12 NM cable in an attic that is 140° F is still good for 21.3 amps  
#10 NM cable in an attic that is 131° F is still good for 30.4 amps

All of these examples fall above our "average" high attic temperature and maintain their useable ampacity. This only applies to SER and NM that is 90°f rated.

Contractors may continue to install 4/0 SER cables in attics on 200 amp feeders and circuits that fall under the requirements of 310.15(B)(7) and inspectors may pass these installations during inspections.

It is understood that if a dwelling unit was running at a maximum calculated load above 166 amps, the outside air temperature was above 91°f and the attic temperature was excessive then an unsafe condition could exist. These conditions rarely exist in Idaho and I have no data showing that houses are burning down across the state due to not applying ambient correction factors using SER or NM in attics. Contractors and inspectors should use their best judgement in determining the need to apply ambient temperature correction factors in situations outside of what this paper covers.

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