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CURRENT CARRYING CAPACITIES FOR FEP (TEFLON) AND SILICONE INSULATED WIRE

Current carrying capacity is defined as the amperage a conductor can carry before melting either the conductor or the insulation.

Heat, caused by an electrical current flowing through a conductor, will determine the amount of current a wire will handle. Theoretically, the amount of current that can be passed through a single copper wire can be increased until the heat generated reaches the melting temperature of the copper.

There are many factors, which will limit the amount of current that can be passed through a wire. These major determining factors are:

Conductor Size:

The larger the circular mil area, the greater the current capacity.

Insulation:

The amount of heat generated should never exceed the maximum temperature rating of insulation material.

Ambient Temperature:

The higher the ambient temperature, the less heat required to reach the maximum temperature rating of the insulation.

Conductor Number:

Heat dissipation is lessened as the number of individually insulated conductors, bundled together, is increased.

Installation Conditions:

Restricting the heat dissipation by installing the conductors in conduit, duct, trays or raceways lessens the current carrying capacity. This restriction can be alleviated somewhat by using proper ventilation methods, forced air-cooling, etc.

Taking into account all the variables involved, no simple chart of current ratings can be developed and used as the final word when designing a system where amperage ratings can become critical.

The following table gives a derating factor to be used when the conductors are bundled together.

DERATING FACTORS FOR BUNDLED CONDUCTORS	
Bundle #	Derating Factors (x Amps)
2-5	0.8
6-15	0.7
16-30	0.5

The following table shows the current required to raise the temperatures of single insulated conductor in free air (30°C ambient) to the listed temperatures.

Copper temp.	80°C	90°C	105°C	125°C	Max. Ratings for FEP (Teflon) and Silicone 200°C
30 AWG	2	3	3	3	4
28 AWG	3	4	4	5	6
26 AWG	4	5	5	6	7
24 AWG	6	7	7	8	10
22 AWG	8	9	10	11	13
20 AWG	10	12	13	14	17
18 AWG	15	17	18	20	24
16 AWG	19	22	24	26	32
14 AWG	27	30	33	40	45
12 AWG	36	40	45	50	55
10 AWG	47	55	58	70	75
8 AWG	65	70	75	90	100
6 AWG	95	100	105	125	135
4 AWG	125	135	145	170	180
2 AWG	170	180	200	225	240

Single Conductor in Free Air 30°C

These charts should only be used as a guide when attempting to establish current ratings on conductor and cable.

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