

(For use in determining current carrying capacity and sizes of etched copper conductors for various temperature rises above ambient)

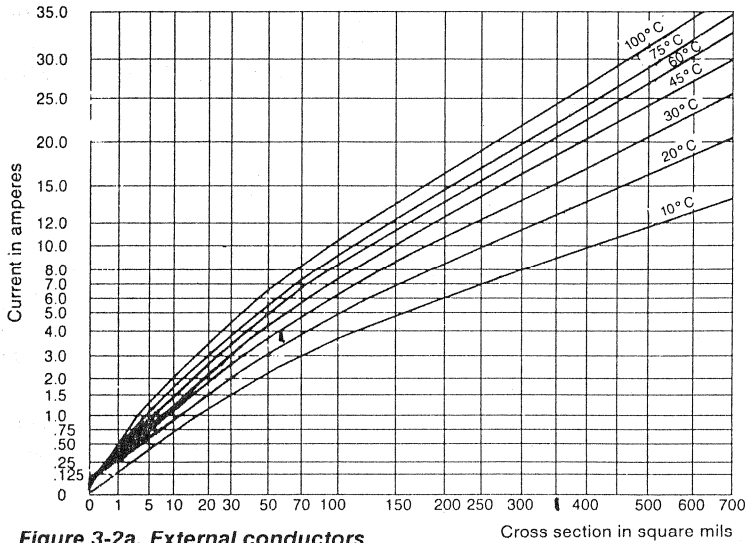


Figure 3-2a. External conductors

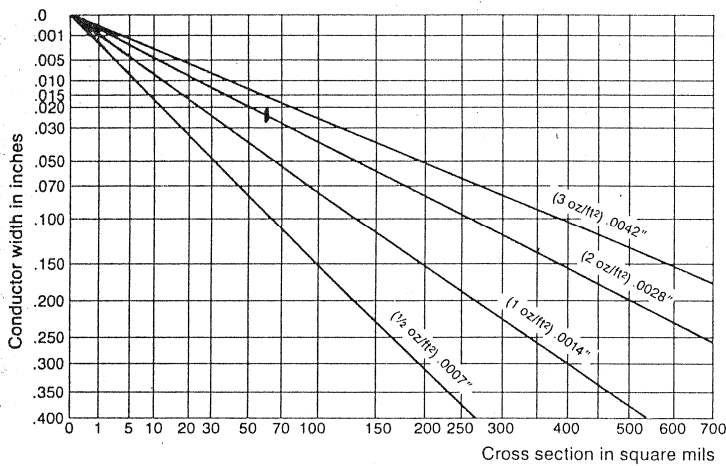


Figure 3-2b. Conductor width to cross-section relationship.

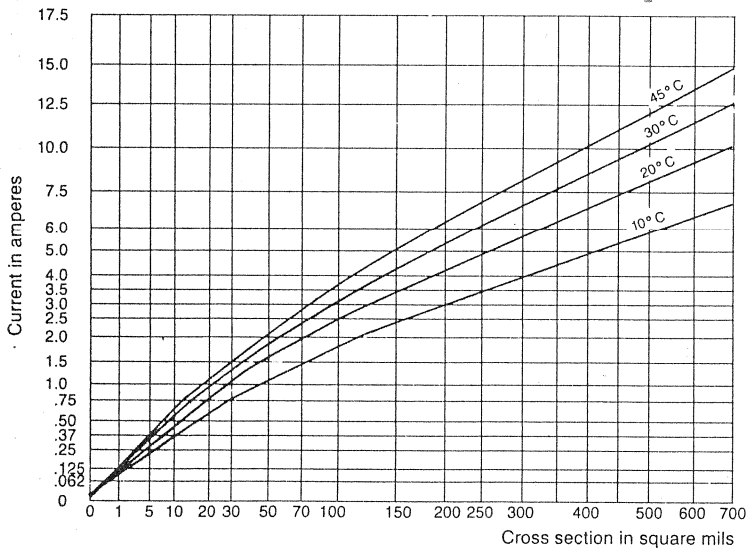


Figure 3-2c. Internal conductors.

NOTES:

1. The design chart has been prepared as an aid in estimating temperature rises (above ambient) vs current for various cross-sectional areas of etched copper conductors. It is assumed that, for normal design, conditions prevail where the conductor surface area is relatively small compared to the adjacent free panel area. The curves as presented include a nominal 10 percent derating (on a current basis) to allow for normal variations in etching techniques, copper thickness, conductor width estimates, and cross-sectional area.
2. Additional derating of 15 percent (current-wise) is suggested under the following conditions:
  - (a) For panel thickness of 1/32 inch or less.
  - (b) For conductor thickness of 0.0042 inch (3 oz/ft<sup>2</sup>) or thicker.
3. For general use the permissible temperature rise is defined as the difference between the maximum safe operating temperature of the laminate and the maximum ambient temperature in the location where the panel will be used.
4. For single conductor applications the chart may be used directly for determining conductor widths, conductor thickness, cross-sectional area, and current-carrying capacity for various temperature rises.
5. For groups of similar parallel conductors, if closely spaced, the temperature rise may be found by using an equivalent cross-section and an equivalent current. The equivalent cross-section is equal to the sum of the cross-section of the parallel conductors, and the equivalent current is the sum of the currents in the conductors.
6. The effect of heating due to attachment of power dissipating parts is not included.
7. The conductor thicknesses in the design chart do not include conductor overplating with metals other than copper.

Figure 3-2. Conductor thickness and width for internal and external layers