Conductor Facts / Flex Life

Flex life (or flex fatigue life) is the number of cycles a sample can withstand when subjected to a repetitive stress or strain before failure. Reversal of stress or strain causes micro-cracks. Continuous cycling causes the fractures to propagate to the point of failure.

Flex fatigue may be tested using different modes of cycling for axial bending, torsion, or rolling. The applied stresses may be in a singular mode or a combined mode. ASTM B 470 specifies a standard flex test for conductor and wire. It is a single mode test and basically subjects a specimen to:

- an axial bending mode
- specimen fixtured with a tensile load of approximately 1,500 psi (10.34 MPa)
- axial bending cycle of +/- 60º from vertical
- flex rate of approximately 24 to 36 full cycles per minute
- specimen flexed over mandrels with a diameter of approximately 4X the specimen diameter
- cycled until complete rupture of the specimen

The major factors influencing flex life, when tested in accordance with ASTM B 470 are the tensile strength and the strand count of the conductor. Higher tensile strength material, in general, exhibits higher flex life. Increasing the number of strands, using finer strand diameter, will also increase the flex life of a given size conductor.

Lay length has an effect on flex life, and shortening the lay length will increase flex life slightly. Conductor construction (with the same number of strands) e.g. true concentric, unilay, etc. will also influence flex life, however the effects of these attributes are less significant than the material's tensile strength, elongation and strand count.

Flex life results are not exact as the range of results within a test group, between test groups and between test apparatus, often produces a large standard deviation. Hence there are no standard values to use for comparison.

Custom constructions are available, please contact the sales department

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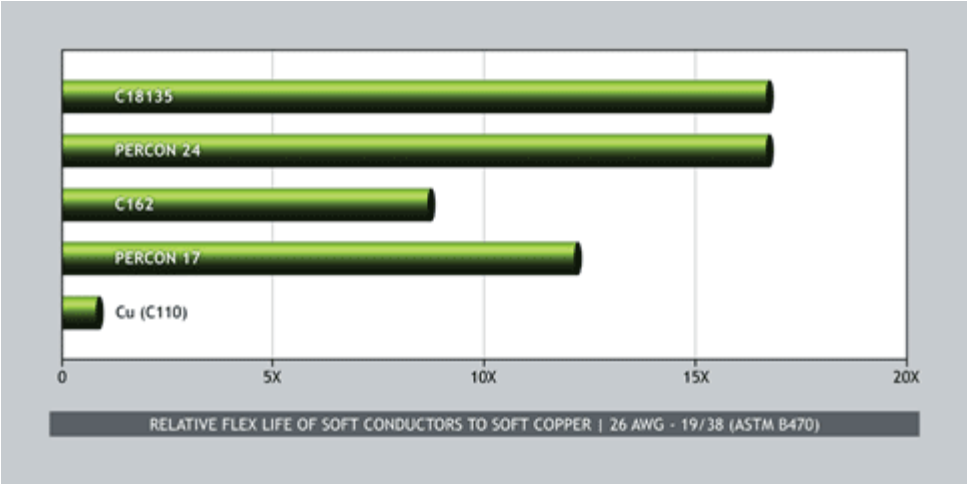
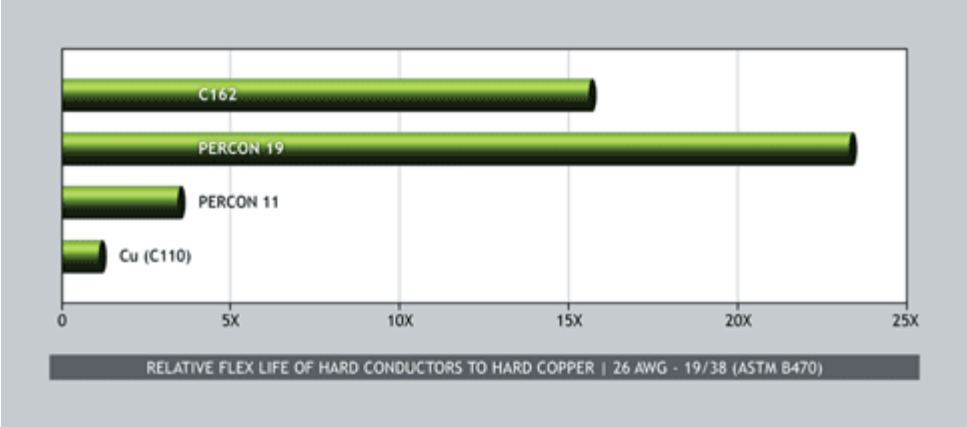
When comparing different alloys, tempers and constructions, flex testing can only rank their relative performance.





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