

**Fatigue in Springs Example (Nise)**

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An as-wound helical compression spring, made of music wire, has a wire size of 0.092 in, an outside coil diameter of 9/16 in, a free length of 4 3/8 in, 21 active coils, and both ends squared and ground. The spring is unpeened. This spring is to be assembled with a preload of 5 lbf and will operate with a maximum load of 35 lbf during use. Estimate the factor of safety guarding against fatigue-failure using a torsional Gerber fatigue-failure criterion with Zimmerli data.