Helical Spring Compression

Nomenclature

d – wire diameter

D – mean diameter of spring $= \left(D_O + D_i\right)/2$

F_i - spring preload

y_i - spring deflection under preload F_i

L_i - spring length under preload F_i

$F_{op\text{-}max}$ - maximum operating force

$y_{op\text{-}max}$ - maximum operating deflection under maximum operating force $F_{op\text{-}max}$

$L_{op\text{-}max}$ - spring length under maximum operating force $F_{op\text{-}max}$

F_s - force required to produce solid spring (all coils touching)

y_s - solid spring displacement under force F_s

L_s - solid spring length

y_{clash} - difference between y_s and $y_{op\text{-}max}$

Helical compression spring (no load) at free length

Helical compression spring with a preload

Helical compression spring at maximum operating load

Helical compression spring at solid height (to be avoided)