

Compression Spring Verification

Sample document with complete example values. It shows the report the purchased export produces for YOUR input - it is not itself a report for any part.

Project: Sample project

Part/Position: no real part

Prepared by: Sample, not released

Cold-formed cylindrical helical compression spring made from round wire

Overall result: OK with notes

Geometry and material

Wire diameter d	4 mm
Coil diameter Dm / De / Di	32 / 36 / 28 mm
Spring index w = Dm/d	8
Stress correction factor k (Bergsträsser)	1.1724
Active coils n / total nt	8.5 / 10.5
Free length L0	120 mm
Spring rate R	9.364 N/mm
Shear modulus G	81,500 N/mm ²
Young's modulus E	206,000 N/mm ²
Minimum tensile strength Rm	1,745 N/mm ²
End coil type	closed and ground
Loading	static
End support factor v	0.5

Working points and limit positions

Point	s in mm	L in mm	F in N	τ in N/mm ²	τ_k in N/mm ²
P1	32.04	87.96	300	382	447.8
P2	53.4	66.6	500	636.6	746.4
Ln (minimum usable length)	71.34	48.66	668	-	-
Lc (solid length)	78	42	730.4	929.9	-

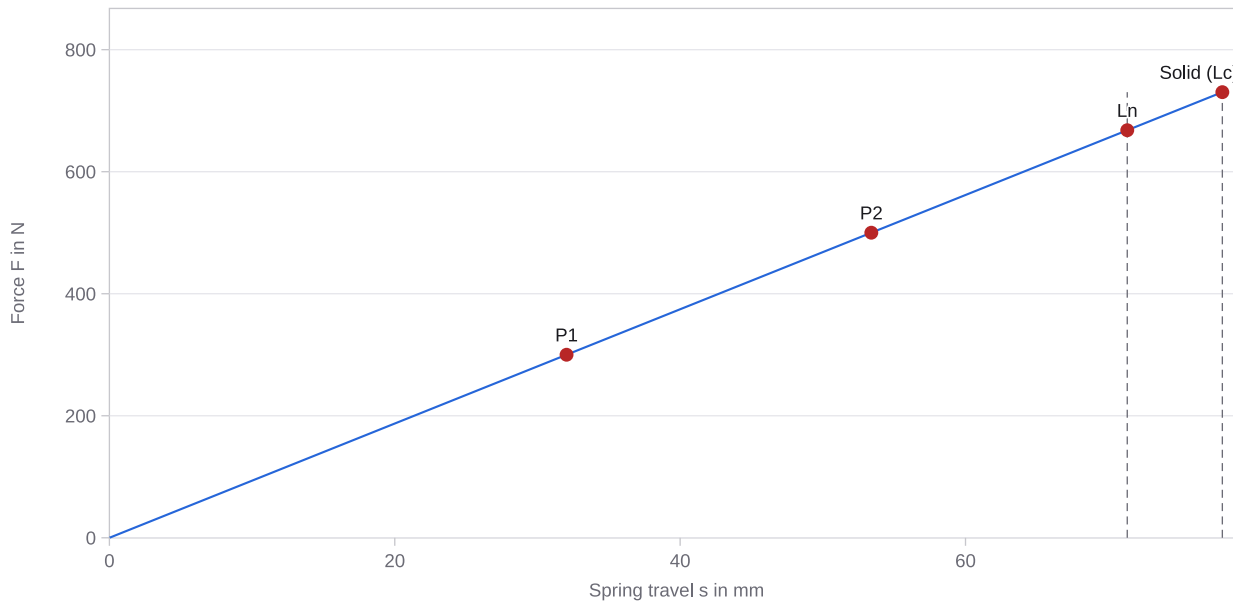
Solid dimensions and margins

Solid length Lc	42 mm
Sum of minimum gaps Sa	6.66 mm
Minimum usable length Ln	48.66 mm
Remaining travel s2 to Ln	17.94 mm
Remaining travel s2 to solid length	24.6 mm
Stress range τ_{kh} (fatigue outlook)	298.6 N/mm ²
Slenderness ratio L0/Dm	3.75

Evaluation criteria

Criterion	Value	Limit	Status
Operating stress $\tau_2 \leq 0.5 R_m$	636.6 N/mm ²	872.6 N/mm ²	● OK
Solid stress $\tau_c \leq 0.56 R_m$	929.9 N/mm ²	977.3 N/mm ²	● borderline
Buckling safety ($s_2 \leq s_K$)	53.4 mm	buckling-safe	● OK

Spring characteristic with operating points and limits (dashed: Ln, Lc)



Calculation basis

Calculation per DIN EN 13906-1 for cold-formed cylindrical helical compression springs made from round wire: spring rate from G , d , D_m and n , shear stress from force and geometry, stress correction per Bergsträsser. Static verification of the uncorrected stress against $0.5 R_m$ (operating) or $0.56 R_m$ (solid). Solid length and minimum gap S_a for cold-formed springs (increased by a factor of 1.5 under dynamic loading), buckling check via the end support factor v per the standard's table. The dynamic fatigue strength verification (Goodman diagram) is not included.

About this sample

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