Disc Spring Verification (DIN 2093)

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

Overall assessment: OK - the deflection is within the flattening limit (s <= h0).

Geometry and material

Outer diameter De	50 mm
Inner diameter Di	25.4 mm
Material thickness t	2 mm
Cone height h0 = l0 - t	1.3 mm
Overall height l0	3.3 mm
Modulus of elasticity E	206,000 N/mm²
Poisson's ratio ν	0.3

Characteristic values

Diameter ratio δ = De/Di	1.969
Height ratio h0/t	0.65
Characteristic value K1	0.6878
Characteristic value K2	1.2126
Characteristic value K3	1.3656

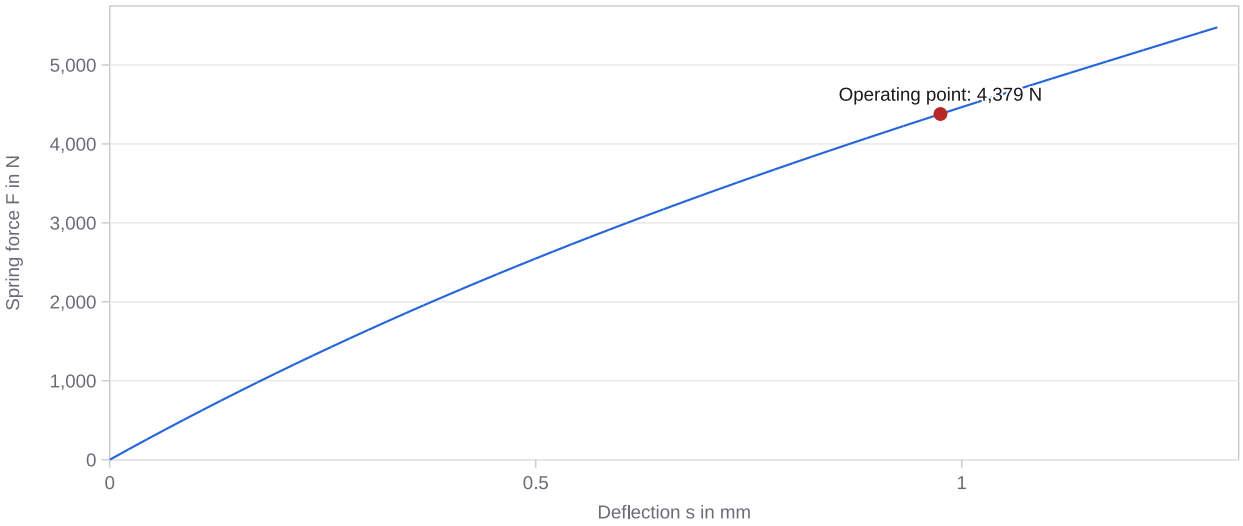
Operating point

Deflection s	0.975 mm
Spring force F(s)	4,378.65 N
Secant spring rate F/s	4,490.92 N/mm
Force at flat position F(h0)	5,476.65 N
Edge stress σ_OM (approximation)	−1,908 N/mm²

Verification

Criterion	Value	Limit	Status
Deflection utilization s/h0	75 %	100 %	● OK

Force-deflection curve



Calculation basis

Single disc spring per DIN 2093 using the Almen-Laszlo calculation approach. The force-deflection relation is nonlinear: $F(s) = 4 \cdot E/(1-\nu^2) \cdot t^4/(K1 \cdot De^2) \cdot (s/t) \cdot [(h0/t - s/t) \cdot (h0/t - s/(2t)) + 1]$. The characteristic values K1, K2 and K3 follow from the diameter ratio $\delta = De/Di$. The edge stress σ_{OM} is an approximation for the top side at the inner edge; a fatigue and settling check as well as the influence of contact areas (K4) are not included.

About this sample

All values on these pages come from a freely chosen example calculation and belong to no real part. The purchased export contains the same sections with your input, your header data (project, part, prepared by) and as searchable text. Pricing and scope: maschinenbaurechner.de/en/pricing