



Disc Spring Material Selection Guide

A buyer-facing guide for narrowing material direction before FeTech reviews geometry, load, temperature, corrosion and fatigue requirements.

Draft review version | English source copy

Use this form to prepare a cleaner RFQ package before engineering review.

1. Start from the Risk, Not the Alloy Name

Material selection should begin with the failure risk the spring must control: preload loss, leakage, corrosion, high temperature relaxation, fatigue cracking, weight limit, magnetic behavior or long maintenance intervals.

What happens if preload is lost?	Defines whether cost, leakage, downtime or safety risk should lead the review.
Is duty static or cyclic?	Fatigue life and surface quality become more important in cyclic service.
What is the real temperature band?	Normal and peak temperature both influence modulus, stress relaxation and alloy route.
What media reaches the spring?	Corrosion exposure often decides whether carbon steel, stainless, nickel alloy or titanium is suitable.

2. Common Material Families

Spring steel	Cost-effective standard disc springs in controlled or protected environments.	Not ideal for severe corrosion or high-temperature retained-load risk.
Stainless / PH stainless	Corrosion resistance with useful spring behavior for many industrial applications.	Confirm grade, heat treatment, temperature and fatigue route.
H13 / SKD61 / hot-work steel	Elevated-temperature service where stronger hot performance is needed.	Corrosion protection and stress relaxation still need review.
Inconel / Nimonic	High temperature, HPHT valves, aerospace, offshore and severe load-retention applications.	Cost is higher; geometry and heat treatment must be justified by service risk.
Hastelloy C-276	Chloride, acid, scrubber and severe chemical process exposure.	Spring performance and corrosion route must be reviewed together.
Titanium alloys	Lightweight, corrosion-resistant, non-magnetic or special equipment needs.	Lower modulus changes load behavior; direct steel replacement is risky.

3. Application Shortlist

Petrochemical flange live loading	Stainless, PH stainless, Inconel or Hastelloy depending on media and temperature.	Bolt size, gasket, temperature, media, leakage history.
Valve packing live loading	PH stainless, Inconel 718/X-750, Nimonic 90 or Hastelloy for severe service.	Stem size, packing, gland space, pressure, temperature, cycles.
Power plant bolting	Spring steel, PH stainless, hot-work steel or nickel alloy depending on heat and corrosion.	Temperature band, maintenance interval, vibration, preload target.
Offshore equipment	Stainless, Inconel, Hastelloy or titanium depending on seawater and HPHT exposure.	Corrosion media, pressure, temperature, access and certificate requirements.
OEM precision assembly	Material depends on load curve, space, fatigue and commercial target.	Drawing, load curve, cycle duty, approval criteria and annual demand.

4. RFQ Material Questions

Known material requirement?	Standard, grade, UNS/JIS/EN/GB reference if specified
Temperature band?	Minimum, normal and maximum
Corrosion media?	Water, seawater, chloride, acid, steam, sour gas, chemical exposure
Cycle or fatigue requirement?	Cycles, frequency, working deflection, acceptance test if known
Certificate requirement?	Material certificate, load test, dimensional report, coating report

Engineering review note: Material selection cannot be separated from geometry and working stress. Fatigue life, K4 geometry source, friction and support face conditions must be reviewed by qualified engineers, together with heat treatment, coating and actual operating temperature, before final material approval.