ELITE SPRINGS PTE LTD

PRODUCT CATALOGUE

Springs | Forming | Cutting

GREETINGS FROM ELITE SPRINGS

This catalogue describes Elite Springs complete service which is intended primarily for engineering design products that are involved in prototype and development work requiring close tolerance spring-type parts.

With more than 20 years of experience, be it designing, making and handling millions of spring parts over the years, this background gives us information about the many types of springs used in various industries, including their materials used, characteristics and usage rates. Hence, Elite Springs catalogue is produced.

Why Elite Springs

1) **Saves Time on Design work.**
   You don't have to waste time designing a spring yourself, you only need to select the catalog number of the item you require.
2) **Saves Money.**
   No tooling charge or setup cost.
3) **Consistency.**
   What you purchase today will be of the same quality for your next order.

Elite Springs is able to handle your spring needs regardless of quantity. In addition, our spring design software allows us to offer design services to help you achieve the maximum lifespan for your springs. Elite Springs is not only a manufacturer but also a reliable business partner.

STAINLESS STEEL PLATE AND SHIM

A shim is a thin piece of material used to fill-in small gaps or spaces between objects, used either for support, adjustment for better fit or to level a surface.

Elite Springs have available shim stock types of SUS 301 stainless shim steel strips from 0.05mm to 2mm thickness. We also cater to any quantity from single 1 meter sheet or even cut to size.

MATERIAL : Stainless Steel Strip SUS Cold Rolled301 CSP FH(JIS 4313)

(CHEMICAL COMPOSITION %)

C	Si	Mn	P	S	Ni	Cr
0.15 Max	1.00 Max	2.00 Max	0.045 Max	0.030 Max	6.00 - 8.00	16.00 - 18.00

thickness (mm)	width (mm)	length 1 metre
0.05	152.4	1000mm
0.06	200	
0.07	200	
0.08	152.4	
0.10	152.4	
0.127	152.4	
0.13	152.4	
0.15	300	
0.18	152.4	
0.20	300	
0.25	300	
0.30	300	
0.40	300	
0.50	300	
0.60	300	
0.70	300	
0.76	152.4	

thickness (mm)	width (mm)	length 1 metre
0.80	250	1000mm
0.90	250	
1.00	300	
1.20	300	
1.50	250	
2.00	152.4	

AVAILABLE IN STOCK

SPRING STEEL PLATE AND SHIM

Spring steel plates are commonly used for making carpentry cutters, axes, vertical hand saws, cutters, chisels and roller and fitter assembly tools.

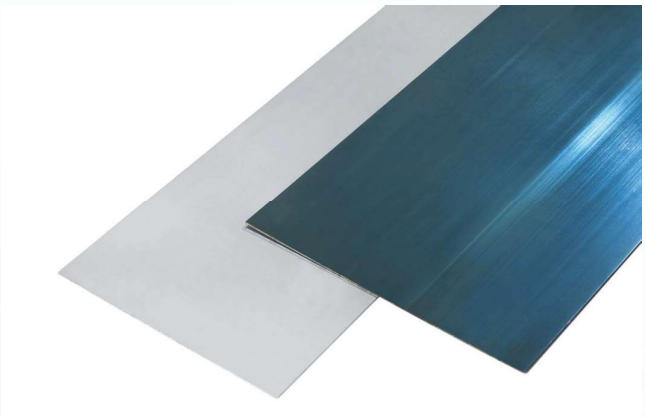
Elite Springs has available stocks of SK5 materials up to 6mm in thickness with both hardened and annealed.

MATERIAL : SK-5 Annealed
Description : Bright Cold Rolled, Skin-Passed
Vickers Hardness (HV) : 200 Max

(CHEMICAL COMPOSITION %) x 100

C	Si	Mn	P	S	Ni	Cr
X100	X100	X100	X100	X100	X100	X100
85	33	46	2	2	24	17.5

thickness (mm)	width (mm)	length 1 metre
1.00	200	1000mm
1.20	200	
1.60	300	
2.00	300	
2.50	300/500	
3.00	300	
3.50	300	
4.00	300	
5.00	300/600	
6.00	300/600	



AVAILABLE IN STOCK

MATERIAL : Carbon Steel Strip SK-5
Description : Hardened and Blue Tempered, With Sheared Edges(JIS)
Rockwell Hardness C (HRC) : 45

(CHEMICAL COMPOSITION %) x 100

C	Si	Mn	P	S	Ni	Cr
X100	X100	X100	X100	X100	X100	X100
85	33	46	2	2	24	17.5

thickness (mm)	width (mm)	length 1 metre
0.07	152.4	1000mm
0.10	200	
0.127	200	
0.15	200	
0.18	200	
0.20	200	
0.23	200	
0.25	200	
0.30	250	
0.38	200	
0.40	250	
0.50	250	

thickness (mm)	width (mm)	length 1 metre
0.60	250	1000mm
0.70	250	
0.80	250	
0.90	250	
1.00	250	
1.20	250	
1.40	250	
1.50	250	
1.60	250	
2.00	250	
3.00	200	

AVAILABLE IN STOCK

GLOSSARY OF SPRING TERMINOLOGY

Active Coils	Coils that deflect under load.
Angular Relationship of Ends	Position of hooks or loops of an extension spring (or ends of a torsion spring) to each other.
Baking	Heating of electroplated springs to relieve hydrogen embrittlement.
Close Wound	Adjacent coils which are in contact.
Closed and Ground Ends	Same as Closed Ends, except the first and last coils are ground to provide a flat bearing surface.
Closed Ends	Compression spring ends with coil pitch angle reduced so they are level with the spring axis and touch the adjacent coils.
Deflection	Motion imparted to a spring by application or removal of an external load.
Elastic Limit	Maximum stress to which a material may be subjected without permanent set.
Endurance Limit	Maximum stress, at a given stress ratio, at which material will operate in a given environment for a stated number of cycles without failure.
Fixture Tempering	Restraining parts during tempering to improve dimensional control.
Free Angle	Angular relationship between arms of a helical torsion spring which is not under load.
Free Length	Overall length of a spring which is not under load.
Heat Setting	A process to pre-relax a spring in order to improve stress relaxation resistance in service.
Helical Springs	Springs made of bar stock or wire coiled into a helical form. This category includes compression, extension and torsion springs.
Hooks	Open loops or ends of extension springs that are generally longer than a standard loops.
Hysteresis	Mechanical energy loss occurred during loading and unloading of a spring within the elastic range. It is illustrated by the area between load-deflection curves.
Initial Tension	The force that tends to keep coils of a close wound extension spring closed and which must be overcome before the coils start to open.
Loops	Circular formed ends, with ends of extension springs that provide a means for attachment.
Mean Diameter	The average diameter of the mass of spring material, equal to one-half the sum of the outside and inside diameters. In a helical spring, this is the equivalent to the outside diameter minus one wire diameter.
Modulus in Shear or Torsion	The coefficient of stiffness used for compression and extension springs.
Modulus in Tension or Bending	(Young's Modulus) The coefficient of stiffness used for torsion or flat springs.
Moment	A product of the distance from the spring axis to the point of load application, and the force component normal to the distance line.
Natural Frequency	The lowest inherent rate of free vibration of a spring vibrating between its own ends.
Passivation	An acid treatment for stainless steel which removes iron deposits and improves corrosion resistance.
Patenting	The process of heating carbon steel above its critical temperature and cooling at a controlled rate to achieve a fine paralytic microstructure.
Pitch	Distance from center to center of wire in adjacent coils in an open-wound spring.
Plain Ends	End coils of a helical spring having a constant pitch and ends not squared.
Plain Ends, Ground	Same as Plain Ends, except wire ends are ground square with the axis.
Preset	See Set Removal
Rate	The change in load per unit of deflection. Generally expressed as Lbs/in or N/mm
Residual Stress	Stress mechanically induced by such means as set removal, shot-peening, cold working, or forming. It may be beneficial or not, depending on the spring application.
Set Permanent	Change of length, height or position after a spring is stressed beyond material's elastic limit.
Set Point	Stress at which some arbitrarily chosen amount of set (usually 2%) occurs. Set percentage is the set divided by the deflection which produced it.
Set Removal	An operation which causes a permanent loss of length or height due to spring deflection.
Shot-Peening	Blasting the surfaces of spring material with steel or glass pellets to induce compressive stresses that improve fatigue life.
Slenderness Ratio	Ratio of spring length to mean diameter L/D in helical springs.
Solid Height	Length of a compression spring when deflected under sufficient load to bring all adjacent coils into contact - no additional deflection is possible.
Spiral Springs	Springs formed from flat strip or wire wound in the form of a spiral, loaded by torque about an axis normal to the plane of the spiral.
Spring Index	Ratio of mean diameter to wire diameter.
Squared and Ground Ends	See Closed and Ground Ends.
Squared Ends	See Closed Ends.
Squareness	Angular deviation, between the axis of a compression spring in a free state and a line normal to the end planes. Squareness Under Load same as Squareness but measured while there is a load applied to the spring.
Stress Range	Difference in operating stresses at minimum and maximum loads.
Stress Ratio	Minimum stress divided by maximum stress.
Stress Relief	A low temperature heat treatment given springs to relieve residual stresses produced by prior cold forming.
Torque	A twisting action in torsion springs which produces rotation. Equal to the load multiplied by the distance (or moment arm) from the load to the axis of the spring. Generally expressed as in-lbs or N-mm. also see Moment
Total Number of Coils	The sum of the number of active and inactive coils in a spring body.

FAQ

1) Do you provide standard stock springs?
From Elite Springs Catalogue customers are able to find standard specifications that are conveniently available for clients through our office or official company website. Elite Springs catalogue is ideal for engineers and toolmakers to source for cost effective designed products and prototyping new assemblies.

2) What are the advantages of having stainless springs passivated?
For stainless steel springs to provide proper corrosion resistance, a process of acid treatment for stainless steel which remove iron deposit is done.

3) Why are Stainless Steel springs magnetic after production?
Stainless steel material become magnetic after a production working process.

4) Does it make a difference on a torsion spring whether its left or right hand wound ?
Yes. To reduce the likelihood of torsion springs taking a set, the spring should be coiled in the direction that result in increased coil count as load is applied. In other words, the spring should be coiled such that it "winds up" when load is applied. If the spring "unwinds" as load is applied, it should probably be coiled in the opposite direction.

5) If I stack two springs, would the rate stay the same ?
Stacking springs definitely changes the spring rate. The effective spring rate of the stack will be less than the softest spring in the stack.

6) If I cut a spring in half, would the rate stay the same ?
Cutting springs generally decreases the number of active coils. Therefore, there is an increase in spring rate.

7) How long will a compression spring last ?
The effective life of a compression spring depends primarily on the time cyclic. In cyclic applications, springs are generally designed for maximum lifespan; however, application nuances such as resonant vibration could highly reduce spring life.

8) Can Disc Springs be Stacked?
Yes. Belleville Disc Springs can be stacked in either a series or in parallel to sustain greater loads and/or deflections than when using a single spring.

9) How far can I safely compress a compression spring?
Compression force depends on the design and material of the part. While normal compression springs can safely be compressed to their usual rate without damage, it is not recommended for parts with relatively few coils. Material is also a factor.

10) What is your minimum order quantity ?
MOQ or minimum order quantity affect pricing.

ELITE SPRINGS PTE LTD
Springs | Forming | Cutting
No. 50 Bukit Batok St. 23 #06-21/22/23/24
Midview Building, Singapore 659578

Tel : 6566 2252
Fax : 6566 2115
Email : enquiries@elitesprings.com
Website : www.elitesprings.com