

NorenSpring

Xuzhou Apex Spring Manufacturing Co., Ltd is a leading manufacturer of custom-engineered springs for MRO and OEM applications across diverse industries worldwide.

Since 2001, NorenSpring has built a strong reputation for quality, reliability, and exceptional customer service, which includes:

Custom Spring Manufacturing

Can't find the exact spring you need? NorenSpring can design and manufacture custom springs for your specific application in quantities ranging from prototypes to full-scale production.

Trusted by Industry Leaders

With more than 11,000 spring designs and over 170 million springs in stock in both English and metric dimensions, NorenSpring is trusted by leading companies across multiple industries. We have established long-term supply partnerships built on consistent quality, reliable delivery, and responsive service.

Strict Quality Standards

Apex products are manufactured in China under rigorous quality controls. We are ISO 9001:2008 certified, ITAR compliant, and can provide RoHS-compliant products upon request.

Superior Customer Support

We offer 24-hour stock shipping and 36-hour sample production based on drawings. Ordering assistance is available by phone, fax, and online. Our website, www.springapex.cn, features our complete catalog, technical resources, and downloadable CAD files.

☎ M: +86-18796422510

✉ E: victoria@springapex.cn

🌐 W: www.springapex.cn

📍 Add: No. 15, Zhongnan Gaoke, LiujiTown, Tongshan District, Xuzhou City, Jiangsu Province, China (221112)



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NorenSpring

Regional Distributor Program launching in 2026. Visit our website or contact us for details.



COMPRESSION SPRINGS



EXTENSION SPRINGS



TORSION SPRINGS



CONICAL SPRINGS



COIL LENGTHS SPRINGS



DIE SPRINGS



Xuzhou Apex Spring Manufacturing Co., Ltd

Company Profile

NorenSpring



NorenSpring

- Xuzhou APEX Spring Manufacturing Co., Ltd., established in 2001 and headquartered in Xuzhou, China, is a comprehensive spring manufacturer specializing in R&D, engineering design, and precision manufacturing. Our company operates multiple production facilities covering over 12,000 square meters and employs approximately 120 staff. We offer a fully integrated production chain, from raw material processing to finished spring products, with wire diameters ranging from 0.1 mm to 80 mm and a monthly production capacity exceeding 4.16 million springs.
- Our product portfolio includes precision compression springs, extension springs, torsion springs, automotive suspension springs, heavy-duty springs, miniature springs, special-shaped springs, wire forms, and a wide range of custom-engineered spring solutions. They are manufactured in compliance with international standards, including IATF 16949, ISO 13485, ISO 9001, ISO 14001, and ISO 45001, and are exported to more than 60 countries and regions worldwide, serving over 2,000 global customers.
- We are committed to delivering high-performance, reliable, and precision-engineered spring solutions as your trusted spring manufacturing expert.



Engineering Collaboration

A structured engineering process involving customer communication, technical requirement analysis, and collaborative solution development.



NorenSpring

Spring Manufacturing Experts

Product Design

CAD

Pro-E

SolidWorks

Our company has a team of 20 engineers and technical specialists, including 8 senior engineers. The team includes professionals with backgrounds in mechanical design, materials engineering, and industrial manufacturing, all with extensive experience in spring design and engineering applications.

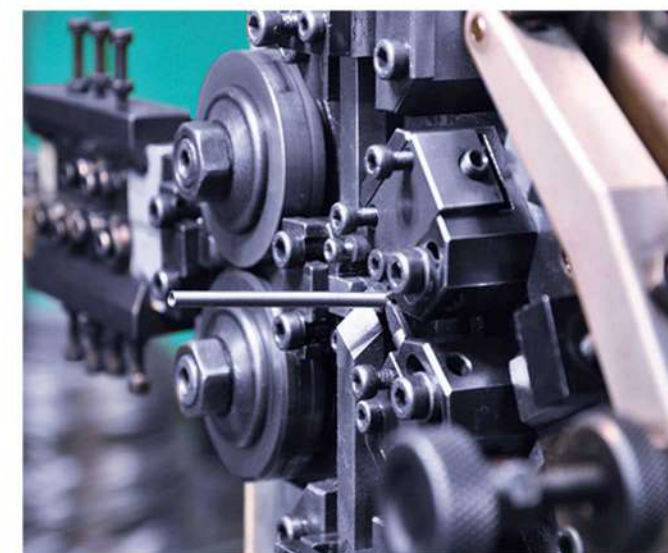
The R&D department combines product development, technology integration, and application engineering. It is capable of independently managing product design, simulation analysis, and process optimization, while continuously improving its spring design and development capabilities to meet customized requirements across a wide range of industries.



Precision Manufacturing

Our manufacturing facilities are equipped with advanced CNC forming machines, automated production lines, heat treatment systems, and precision testing equipment. Every step of the production process—from incoming material inspection to final quality control—is managed under a strict quality system to ensure consistent, accurate, and reliable products.

We are also committed to providing a safe and well-organized workplace, and support employee development through regular training and skill improvement programs.



NorenSpring

Spring Manufacturing Experts

Compression Springs



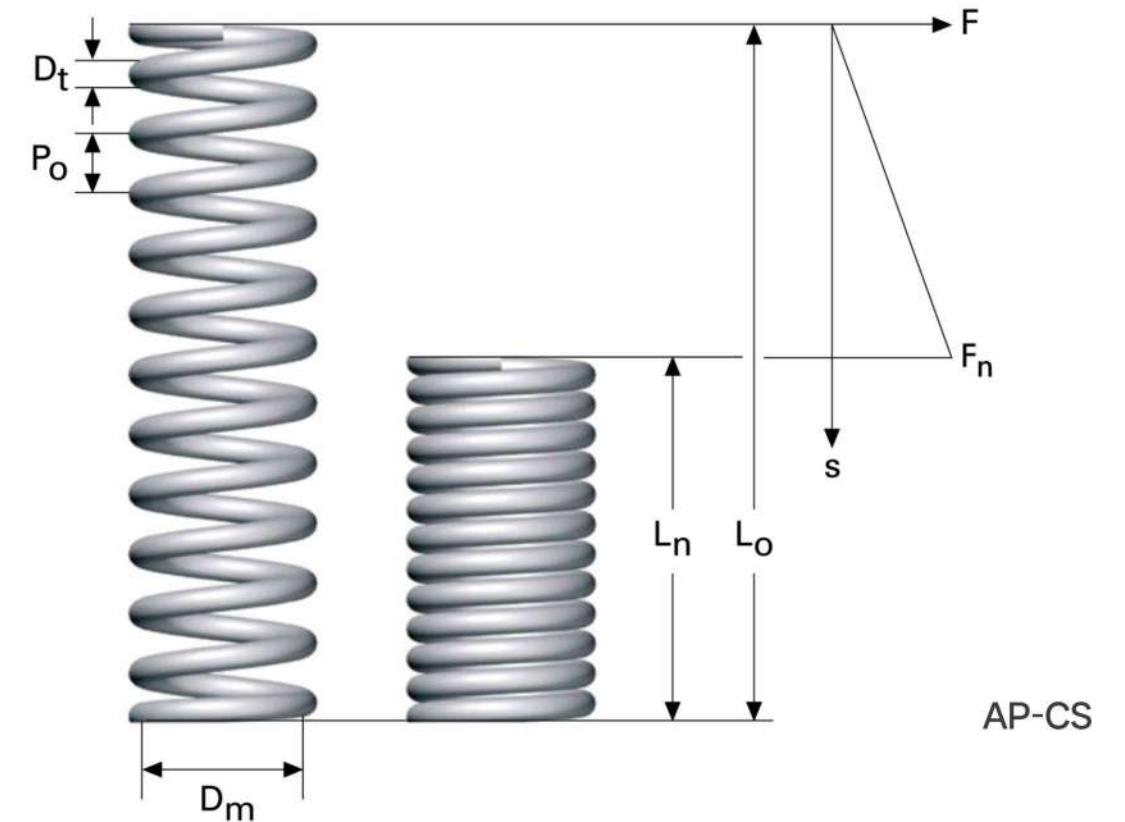
Compression springs resist compressive forces and store mechanical energy when compressed. Once the load is released, they return to their original shape. They can be produced in a wide range of wire diameters, lengths, and load requirements. Materials include stainless steel, carbon steel, and alloy steel. Surface treatments are available to enhance corrosion resistance and durability.

Applications: automotive suspension and braking systems, engine components, mechanical valves, shock absorbers, household appliances, industrial machinery, agricultural equipment, medical devices, and precision instruments.



NorenSpring

Spring manufacturing experts



Compression springs for general use.
Dimensions according to international standards.

All dimensions are in mm

- D_t = Wire diameter
- D_m = Mean diameter
- $D_{i \min}$ = Inner diameter with smallest possible tolerance
- L_o = Unloaded length
- n_t = Total number of coils
- L_n = Permitted loaded length for static load
- F_n = Spring force in Newtons at L_n
- R = Rate Newton / mm
- P_o = Pitch
- L_{st} = Solid length = $D_t \times n_t$
- s = Deflection

Coiling: Right hand

Springs with $D_t \leq 0.4$ do not have ground end coils, others have 3/4 end coils ground.

Springs with $D_t \geq 2.0$ are shot peened.

Pre-setting

Springs having a calculated high stress under load to L_n are pre-set to solid length.

Min load length and temperature

Minimum load length L_n applies for static or pseudo static loaded springs operating at temperature up to about 40°C for unalloyed springs and up to about 150°C for stainless steel springs.

The relaxation, i.e. the power loss over time, will then stay within acceptable values for most applications. At higher operating temperatures or dynamic life demands, more than 10,000 cycles, the spring should not be loaded as far as L_n .

Maximum permitted operating temperature

EN10270-1-SH ~120 °C
EN 10270-2-FDSiCr ~250 °C
EN10270-3-1.4310 ~250 °C
SUS304WPB ~250 °C

1 kp = 9.80665 Newtons, 1 Newton = 0.10197 kp

Extension Springs

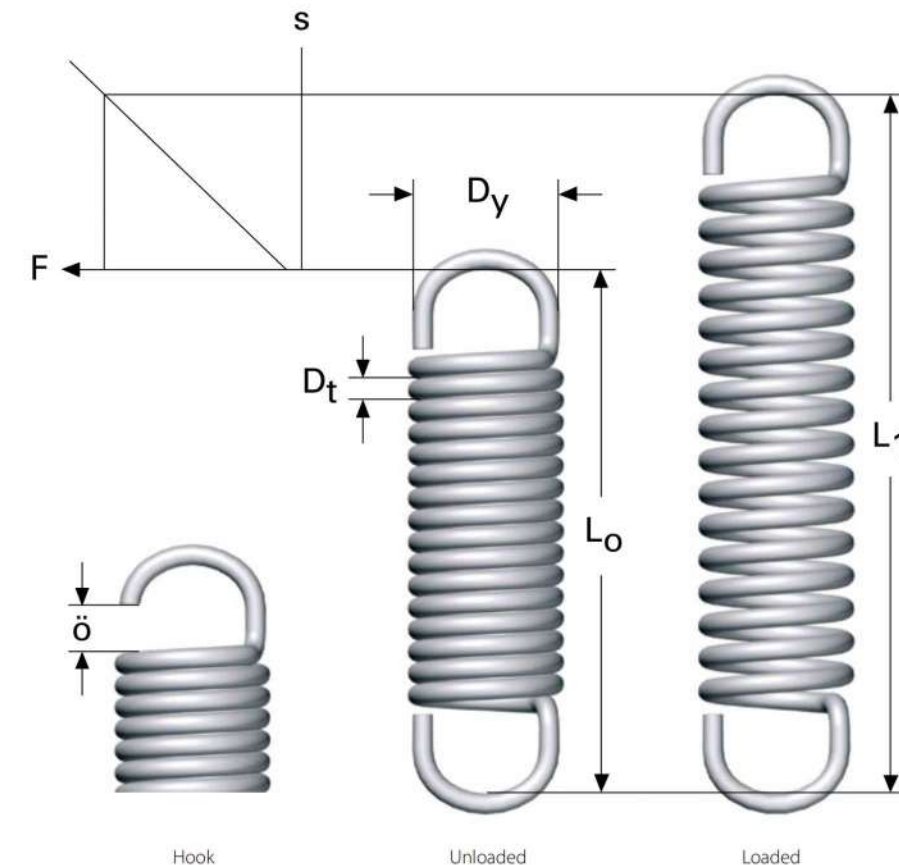


Extension springs work by resisting pulling forces. They are tightly coiled and designed to extend under load, returning to their original length when the force is released. Materials such as stainless steel, carbon steel, and alloy steel are available, with optional surface treatments to improve durability and corrosion resistance.

Applications: garage doors, agricultural machinery, industrial equipment, automotive systems, mechanical linkages, fitness equipment, trampolines, medical devices, electrical switches, and control mechanisms.



NorenSpring



AP-ES

All dimensions are in mm

D_t = Wire diameter

D_y = Outer diameter

L_0 = Free length

n_v = No of active coils

R = Rate

F_0 = Initial force in Newtons, required force before the spring starts to extend

L_n = Permitted extended length for dynamic load

F_n = Spring force in Newtons

s = Deflection

Stainless spring steel

EN 10270-3-1.4310

Maximum load length L_n applies for static or pseudo static loaded springs operating at temperature up to about 150°C. The relaxation, i.e. the power loss over time, will then stay within acceptable values for most applications. At higher operating temperatures or dynamic life demands, more than 10,000 cycles, the spring should not be loaded as far as L_n . Maximum permitted operating temperature of stainless spring steel EN10270-3-1.4310 is about 250 °C.

Length of loop is minimum $0.75 * D_i$

Max load length and temperature

Unalloyed spring steel

EN 10270-1-SH

Maximum load length L_n applies for static or pseudo static loaded springs operating at temperature up to about 40°C. The relaxation, i.e. the power loss over time, will then stay within acceptable values for most applications. At higher operating temperatures or dynamic life demands, more than 10,000 cycles, the spring should not be loaded as far as L_n . Maximum permitted operating temperature of unalloyed spring steel EN10270-1-SH is about 120 °C.

To calculate the spring force at a certain length, the travel in mm is multiplied by the rate (R) + the initial force (F_0).

1 kp = 9.80665 Newtons, 1 Newton = 0.10197 kp

Torsion Springs



Torsion springs operate by twisting around their axis and store rotational energy, releasing torque when required. They are designed to provide controlled rotational force in various mechanical systems. Materials such as stainless steel, carbon steel, and alloy steel are available, with optional surface treatments to improve fatigue resistance and durability.

Applications: door hinges, industrial machinery, automotive components, electrical switches, control systems, mechanical linkages, clips, counterbalance mechanisms, folding devices, agricultural equipment, and household appliances.



AP-TS-3100



AP-TS-3344



AP-TS-3000



AP-TS-3210

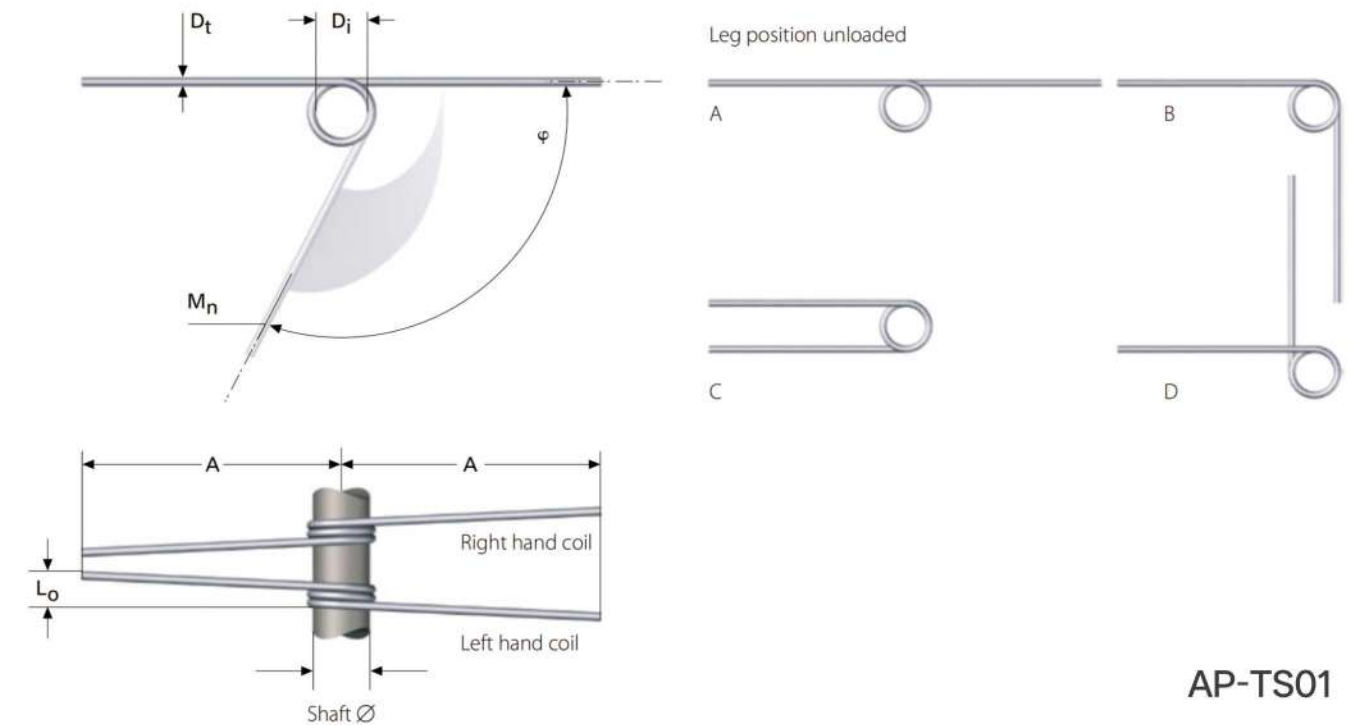


AP-TS-1350



AP-TS-3229

NorenSpring



AP-TS01

Cylindrical wound torsion springs are used for axial loads, i.e. a circular movement. When loaded, the wire is exposed to a deflection. Normally, the inside body diameter is mounted on a shaft or similar. Mounting must be carried out in such a way that there is always play between the inner diameter and the shaft. See examples in the tables below. The load must be applied in such a way that the torque application binds the spring (see figure), as it is strongest in this direction. To minimise the friction against the shaft, use of fixed tension ends is preferable.

Torsion springs have a linear spring characteristic, i.e. if a spring is turned 10° to provide torque of 1 Nmm, the same spring will provide a torque of 2 Nmm at 20° torsion.

Torque

Torque is equal to force x leg length:
 $M = F \times A$. The closer to the end of the leg the load is applied, the less counter force is created. The following tables specify torque in Nmm, i.e. the force obtained on the leg 1 mm from the centre.

Permitted load, life

If the maximum torque angle (ϕ) as specified in the following tables is used, a maximum of 10 000 load cycles is permitted. If only 80% of the permitted torque angle is used, the lifespan of the spring increases to 200 000–400 000 load oscillations. If only 70% of the permitted torque angle is being used, an almost infinite lifespan can be expected.

Ends

All dimensions are in mm

- D_t = Wire diameter
- D_i = Inner diameter
- n_v = Number of sprung coils
- A = Leg length
- L_o = Length
- M_n = Maximum permitted torque Nmm
- ϕ = Torque angle at M_n
- R = Rate, Nmm per degree

Material: Stainless steel EN 10270-3-1.4310

1 kp = 9.80665 Newtons, 1 Newton = 0.10197 kp

Pin Springs



Pin springs are precision spring components designed for positioning, locking, and retaining functions in mechanical assemblies. They can be manufactured in different sizes, force levels, and structural designs to meet various assembly requirements.

Applications: automobiles, motorcycles, power tools, industrial machinery, automation equipment, door locks, hinges, electrical switches, connectors, medical devices, agricultural machinery, construction equipment, and precision instruments.



AP-PS-4990



AP-PS-4201



AP-PS-4889



AP-PS-4355

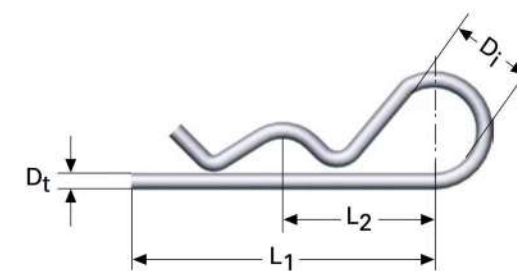


AP-PS-4777



AP-PS-4560

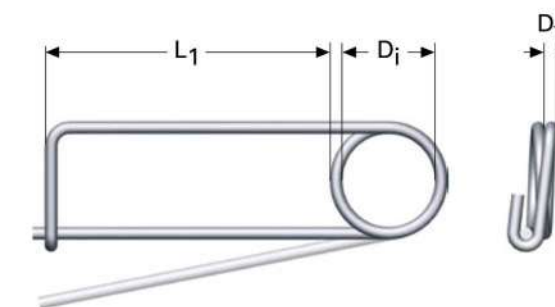
NorenSpring



AP-PSA

Material: Spring steel EN 10270-1-SM
Stainless steel EN 10270-3-1.4310

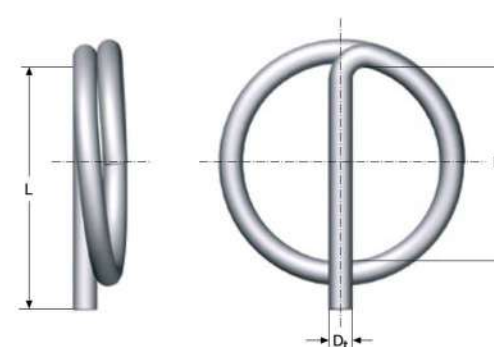
D _t	D _i	L ₁	L ₂	For shaft Ø	Drill hole	SS1774-04 Cat.no	SS2331-06 Cat.no
1,2	6	22	11	5-9	1,5		4220
1,5	8	28	14	7-11	2		4221
2	10	36	18	10-15	2,5	4216	4222
3	15	54	27	14-22	4	4217	4223
4	20	72	36	20-30	5	4218	4224
5	25	90	45	25-35	6	4219	



AP-PSB

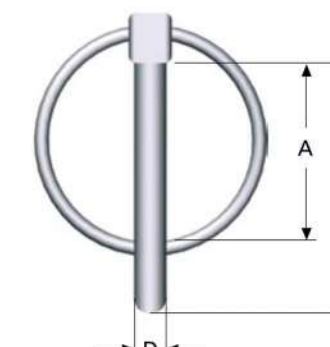
Material: Spring steel EN 10270-1-SM
Stainless steel EN 10270-3-1.4310

D _t	D _i	L	Drill hole	SS1774-04 Cat.no	SS2331-06 Cat.no
2	15	45	2,5	4226	4230
3	18	55	4	4227	4231
4	22	65	5	4228	
5	25	75	6	4229	



AP-PSA

For locking on shaft pin with hole.
Material: Stainless steel EN 10270-3-1.4310



AP-PSD

Locking pin for shaft (tractor pin).
Material: Spring steel EN 10270-1-SM
Finish: Galvanised and yellow chromated

D _t	D _i	L	For shaft Ø	Cat. no
1	8,2	10	7-8	8635
1,2	10,3	12,5	9-10	8636
1,3	12,3	14,5	11-12	8637
1,4	14,4	17	13-14	8638
1,5	16,4	19	15-16	8639
1,7	18,5	22	16-18	8640
1,8	20,5	24	19-20	8641
1,9	22,6	26,5	21-22	8642
2	25,8	30	23-25	8643
2,5	31	36	26-30	8644

D	A	L	Cat.no
4,5	25	35	7602
6	32	45	7603
8	34	45	7604
9,5	34	45	7605
11	34	51	7606

Custom Springs



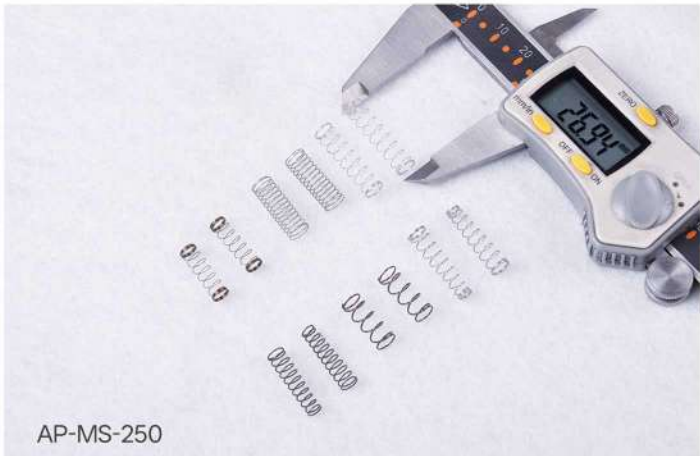
AP-DS-001



AP-DSC-007



AP-WS-120



AP-MS-250



AP-CMS-500



AP-CMS-510



AP-CMS-507



AP-CMS-509



AP-CMS-513



AP-CMS-533



NorenSpring

Custom Springs

Made to Specification

Request a Quote Today!

From prototypes to large-scale production, NorenSpring provides the engineering and manufacturing support you need. Work with an NorenSpring engineer to address design challenges, select appropriate materials and surface finishes, and ensure your spring design is optimized for its intended application.

M: +86-18796422510 E: victoria@springapex.cn W: www.springapex.cn

Inspection & Shipment

All springs are fully inspected for dimensional accuracy, mechanical performance, and surface quality before being stored. Only approved products are released to the warehouse and prepared for shipment following final order verification and packaging.



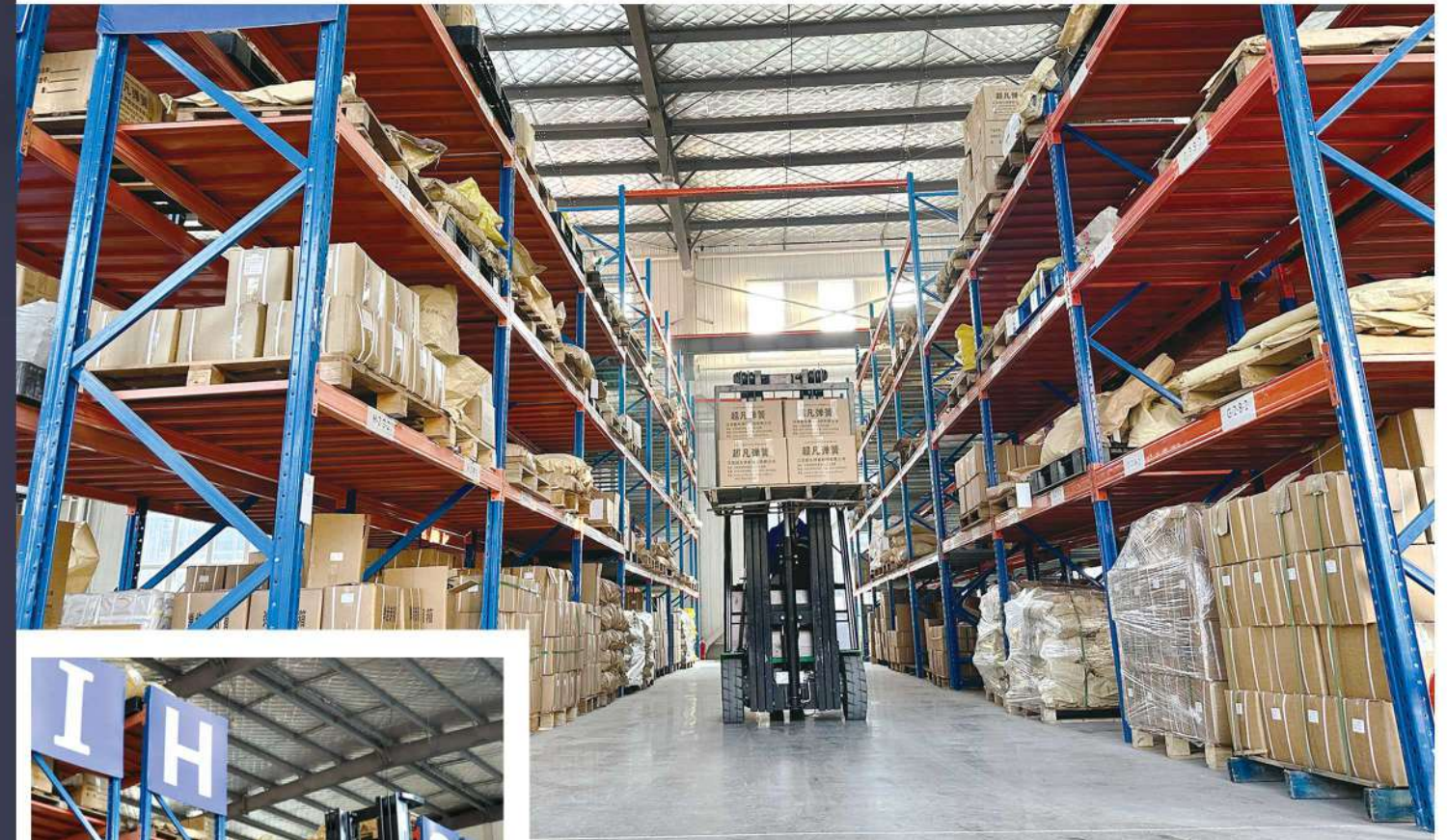
· Salt spray testers



· Tension and compression testing machines



· Projectors





Aerospace & Military Spring Solutions



Automotive Spring Solutions



Electronics Industry Precision Spring Solutions



Energy Industry Spring Solutions



Industrial Machinery Spring Solutions



Medical & Pharmaceutical Spring Solutions



Metal Working Industry Spring Solutions



Packaging & Material Handling Spring Solutions



R&D Prototyping & Design Engineering Spring Solutions



Sporting & Recreation Spring Solutions

Global Market



Serving Industries Worldwide

NorenSpring maintains a growing global presence and a deep understanding of international markets, enabling us to deliver tailored solutions for diverse regional requirements. With a strong focus on precision and quality, we work closely with our customers to provide reliable spring solutions that meet their specific needs, wherever their business operates around the world.

We also support global OEM and custom manufacturing projects, ensuring stable supply, consistent quality, and on-time delivery for customers across different industries and regions.

NorenSpring is your global source for stock springs, custom springs, and wire products for international industries including:

- Aerospace
- Computer and Telecommunications
- Defense
- Industrial and Manufacturing Equipment
- Instrumentation and Controls
- Medical, Dental and Veterinary Devices
- Pharmaceutical Delivery Systems
- Robotics and Automations
- Sporting Goods and Toys
- Stampings and Machining
- Tools and Hardware
- Transportation
- Valves and Pumps and more...



NorenSpring

Custom Springs for Your Project

Every spring begins with a single wire. From this foundation, we combine engineering expertise and advanced manufacturing capabilities to deliver custom spring solutions built around your exact requirements.

From drawings or samples to prototypes and final production, we support your project at every stage. Contact us to turn your design into reliable, high-quality springs and start your custom order with confidence.

Standard Wire Gauges

Gauge	Metric	Imperial	Gauge	Metric	Imperial
7/0	12.7	0.500"	15	1.829	0.072"
6/0	11.79	0.464"	15.5	1.727	0.068
5/0	10.97	0.432	16	1.626	0.064
4/0	10.16	0.4	16.5	1.524	0.06
3/0	9.45	0.372	17	1.422	0.056
2/0	8.839	0.348	17.5	1.321	0.052
0	8.23	0.324	18	1.219	0.048
1	7.62	0.3	18.5	1.118	0.044
2	7.01	0.276	19	1.016	0.04
2.5	6.706	0.264	19.5	0.965	0.038
3	6.401	0.252	20	0.914	0.036
4	5.893	0.232	20.5	0.864	0.034
4.5	5.639	0.222	21	0.813	0.032
5	5.385	0.212	21.5	0.762	0.03
6	4.877	0.192	22	0.711	0.028
7	4.47	0.176	22.5	0.66	0.026
7.5	4.267	0.168	23	0.61	0.024
8	4.064	0.16	23.5	0.584	0.023
8.5	3.861	0.152	24	0.559	0.022
9	3.658	0.144	25	0.508	0.02
9.5	3.454	0.136	26	0.457	0.018
10	3.251	0.128	27	0.417	0.0164
10.5	3.099	0.122	28	0.376	0.0148
11	2.946	0.116	29	0.345	0.0136
11.5	2.794	0.11	30	0.315	0.0124
12	2.642	0.104	31	0.295	0.0116
12.5	2.489	0.098	32	0.274	0.0108
13	2.337	0.092	33	0.254	0.01
13.5	2.184	0.086	34	0.234	0.0092
14	2.032	0.08	35	0.213	0.0084
14.5	1.93	0.076	36	0.193	0.0076

Preferred Metric sizes for Wires (mm)

0.200	0.224	0.250	0.280	0.315	0.355	0.400
0.45	0.50	0.56	0.63	0.71	0.80	0.90
1.00	1.12	1.25	1.40	1.60	1.80	2.00
2.24	2.50	2.80	3.15	3.55	4.00	4.50
5.00	5.60	6.30	7.10	8.00	9.00	10.00
11.20	12.50					

Quantity	To Convert From	To	Multiply By
Force	Newton's	Kilograms	0.102
		Pounds	0.22487
		Grams	102
		Ounces	3.5979
		Drams	57.5667
	Kilograms	Newton's	9.807
		Pounds	2.2046
		Grams	1000
		Ounces	35.27
		Drams	564.37
	Pounds	Newton's	4.448
		Kilograms	0.4536
		Grams	453.6
		Ounces	16
		Drams	256
	Grams	Newton's	0.009807
		Kilograms	0.001
		Pounds	0.0022046
		Ounces	0.03527
		Drams	0.56437
	Ounces	Newton's	0.278
		Kilograms	0.2835
		Pounds	0.0625
		Grams	28.35
		Drams	16
	Drams	Newton's	0.017375
		Kilograms	0.001772
		Pounds	0.003906
		Grams	1.772
		Ounces	0.0625
Quantity	To Convert From	To	Multiply By
Length	Metres	Feet	3.208
		Inches	39.3701
		Millimetres	1000
	Feet	Metres	0.3048
		Inch	12
		Millimetres	304.8
	Inches	Metres	0.0254
		Feet	0.08333
		Millimetres	25.4
	Millimetres	Metres	0.001
		Feet	0.003281
		Inches	0.0393701

Conversion Tables

Quantity	To Convert From	To	Multiply By
Rate	Kg/mm	Lb/in	55.998
		N/mm	9.807
		kN/m	9.807
		ozs/in	895.97
	Lb/in	Kg/mm	0.017858
		N/mm	0.175133
		kN/m	0.175133
		ozs/in	16
	kN/m or N/mm	Kg/mm	0,0101968
		Lb/in	5.7099
		Ozs/in	91.358
	Ozs/in	Kg/mm	0.0011612
		Lb/in	0.0625
		kN/m	0.0109458
		N/mm	0.0109458
Torque	Kg/mm	Lb/in	0.086796
		N/mm	0.009807
		Ozs/in	1.3887
	Lb/in	Kg/mm	11.52125
		N/mm	0.1129889
		Ozs/in	16
	N/mm	Kg/mm	101.968
		Lb/in	8.850413
		Ozs/in	141.6069
	ozs/in	Lb/in	0.0625
		Kg/mm	0.72
		N/mm	0.007062
Stress	Lb/in ²	Kg/mm ²	0.000703
		Hectobars	0.000689
		N/mm ²	0.000689
		T/in ²	0.000446
	Kg/mm ²	Lb/in ²	1421.933
		Hectobars	0.9807
		N/mm ²	9.807
		T/in ²	0.6348
	Hectobars	Lb/in ²	1449.92
		Kg/mm ²	1.01968
		N/mm ²	10
		T/in ²	0.6473
	N/mm ² or Mn/m ²	Lb/in ²	145.038
		Kg/mm ²	0.101968
		Hectobars	10
		T/in ²	0.06473

Quantity	To Convert From	To	Multiply By
Stress	T/in ²	Lb/in ²	2240
		Kg/mm ²	1,5752
		Hectobars	1.54488
		N/mm ²	15.4488
Area	In ²	mm ²	645.16
		In ²	0.00155
Volume	In ³	mm ³	16387
		In ³	0.000061024

Approximate Coil Spring Weight Calculations

1. Length of Wire
- = $\pi \times \text{Mean Diameter} \times \text{total coils} + \text{leg lengths}$
2. Weight of spring in KG per 1000 =
- $\text{Length of wire} \times \pi r^2 \times \text{Density kg/mm}^3$
- (r = radius of wire)

Strip Component weights in KG per 1000 =

1. Length x Width x Thickness x Density above kg/mm³

