Compression Spring (Series 146)

Engineering Hardware & Fasteners · engineeringhardware.com/fastener/cad-svg-146-spring

Compression Spring are catalogued in od 5.2-50 mm, with long 20-200 mm. 10 sizes are held in the table below, and the technical drawing redraws to whichever row you select.

OD

5.2-50 mm

Long

20-200 mm

Catalogued sizes

10

Dimensions are nominal values from the governing standard. Confirm the tolerance class for your application before ordering.

Materials & Grades

Select a material class to see the grades we supply it in. Each designation is listed with its ISO/EN, AISI/SAE, JIS and GB equivalents.

Stainless Steel

Carbon Steel 66

Alloy Steel 41

Bearing Steel 5

Spring Steel 25

Aluminum and Aluminum Alloys21

Brass17

Bronze11

Copper8

Titanium and Titanium Alloys18

Nickel and Nickel Alloys22

Iron-Nickel and High-Temperature Alloys10

Tool Steel and Specialty Hardened Steel9

Structural and Construction Steel9

Stainless Steel

Austenitic Stainless Steel

A1
AISI 303 · SAE 303 · SUS303 · EN 1.4305 · X8CrNiS18-9

A2
AISI 304 · SAE 304 · SUS304 · EN 1.4301 · X5CrNi18-10 · 06Cr19Ni10

304L
AISI 304L · SUS304L · EN 1.4307 · X2CrNi18-9 · 022Cr19Ni10

302
AISI 302 · SUS302 · EN 1.4310

305
AISI 305 · SUS305 · EN 1.4303

A4
AISI 316 · SAE 316 · SUS316 · EN 1.4401 · X5CrNiMo17-12-2 · 06Cr17Ni12Mo2

316L
AISI 316L · SUS316L · EN 1.4404 · X2CrNiMo17-12-2 · 022Cr17Ni12Mo2

321
AISI 321 · SUS321 · EN 1.4541 · X6CrNiTi18-10

310 / 310S
AISI 310 · AISI 310S · SUS310S · EN 1.4845

302HQ
AISI 302HQ

A3

A5

347
AISI 347 · SUS347 · EN 1.4550 · X6CrNiNb18-10

309 / 309S
AISI 309 · AISI 309S · SUS309S

Martensitic Stainless Steel

AISI 410
SUS410 · EN 1.4006 · X12Cr13 · 12Cr13

AISI 420
SUS420J1 · SUS420J2 · EN 1.4021 · EN 1.4028 · 20Cr13 · 30Cr13

AISI 431
SUS431 · EN 1.4057 · X17CrNi16-2

C1

C3

C4

AISI 440A

AISI 440B

AISI 440C
SUS440C · EN 1.4125

Ferritic Stainless Steel

AISI 430
SUS430 · EN 1.4016 · X6Cr17 · 10Cr17

F1

AISI 434

AISI 444

Precipitation-Hardening Stainless Steel

17-4 PH
AISI 630 · UNS S17400 · SUS630 · EN 1.4542 · X5CrNiCuNb16-4

15-5 PH
UNS S15500

17-7 PH
UNS S17700

Duplex and Super Duplex Stainless Steel

Duplex 2205
UNS S31803 · UNS S32205 · EN 1.4462

Super Duplex 2507
UNS S32750 · EN 1.4410

D2

D4

D6

D8

Lean Duplex 2101
UNS S32101

Super Duplex S32760
UNS S32760 · EN 1.4501

Carbon Steel

Low-Carbon Steel

- SAE 1006
- SAE 1008
- SAE 1010
- SAE 1018
- SAE 1020
- Q195
- Q235
- SAE 1012
- SAE 1015
- Q215
- ML08
- ML08Al
- ML10
- ML15
- ML20
- SWRCH6A
- SWRCH8A
- SWRCH10A
- SWRCH12A
- SWRCH15A
- SWRCH18A

Medium-Carbon Steel

- SAE 1035

SAE 1045
S45C
C45
SAE 1030
SAE 1040
SAE 1050
30
35
40
45
50
S35C
S40C
S50C
C35
C40

High-Carbon Steel

SAE 1060
SAE 1070
65Mn
SAE 1065
SAE 1075
SAE 1080
SAE 1085
SAE 1090
SAE 1095
60

65
70
75
80
85

Cold-Heading Steel

SWRCH22A
10B21
SWRCH22K
SWRCH25K
SWRCH30K
SWRCH35K
SWRCH40K
ML20Mn
ML25
ML30
ML35
ML40
15B25

Alloy Steel

Chromium Steel

40Cr
45Cr
AISI 5140

SAE 5140
AISI 5120
SAE 5120
SCr420
SCr440

Chromium-Molybdenum Steel

35CrMo
42CrMo
AISI 4140
SCM435
SCM440
42CrMo4
30CrMo
AISI 4130
SAE 4130
SAE 4140
AISI 4142
AISI 4145
SCM415
SCM420
SCM445
EN 1.7220
EN 1.7225
25CrMo4
34CrMo4

Nickel-Chromium-Molybdenum Steel

- AISI 4340
- SAE 4340
- 40CrNiMo
- SNCM439
- EN 1.6511
- 36CrNiMo4

Boron Alloy Steel

- 10B22
- 10B21
- 15B21
- 15B25
- 20MnTiB
- 20Mn2B
- 35VB
- 40MnB

Bearing Steel

Bearing Steel

- GCr15
- AISI 52100
  SAE 52100 · UNS G52986
- SUJ2
- 100Cr6
  EN 1.3505
- GCr15SiMn

Spring Steel

Carbon Spring Steel

SAE 1065
SAE 1070
SAE 1075
SAE 1080
SAE 1095
65
70
75
80
65Mn

Silicon-Manganese Spring Steel

60Si2Mn
60Si2MnA
SUP6
SUP7

Chromium-Vanadium Spring Steel

50CrVA
SAE 6150
AISI 6150
SUP10

Stainless Spring Steel

AISI 301
SUS301

EN 1.4310
AISI 302
AISI 304
AISI 316
17-7 PH

Aluminum and Aluminum Alloys

Commercially Pure Aluminum

1050
1060
1070
1100

2xxx Series Aluminum

2024
2011
2014
2017

5xxx Series Aluminum

5052
5083
5754

6xxx Series Aluminum

6061
6061-T6

6063

6082

6082-T6

7xxx Series Aluminum

7075

7075-T6

7005

7050

7075-T73

Brass

Free-Cutting Brass

C36000

H62

HPb59-1

C3601

C3602

C3604

CuZn36Pb3

CuZn39Pb3

EN CW614N

EN CW617N

H65

Lead-Free Brass

C69300

C27450

CW510L

CW511L

Naval Brass

C46400

CuZn39Sn1

Bronze

Silicon Bronze

C65500

C65100

C65600

Phosphor Bronze

C51000

C52100

CuSn6

CuSn8

Aluminum Bronze

C95400

C95500

C63000

CuAl10Ni5Fe4

Copper

Copper

- C11000
- T2
- C10100
- C10200
- C12200
- T1
- TU1
- TU2

Titanium and Titanium Alloys

Commercially Pure Titanium

- Grade 2
- Grade 1
- Grade 3
- Grade 4
- TA1
- TA2
- TA3

Alpha-Beta Titanium Alloys

- Grade 5
- Ti-6Al-4V
- TC4
- UNS R56400

Low-Interstitial Grade

- Grade 23
- Ti-6Al-4V ELI
- UNS R56407

Other Titanium Fastener Alloys

- Ti-6Al-6V-2Sn
- Ti-6Al-2Sn-4Zr-2Mo
- Beta-C titanium
- Ti-10V-2Fe-3Al

Nickel and Nickel Alloys

Commercially Pure Nickel

- Nickel 200
- UNS N02200
- Nickel 201
- UNS N02201

Inconel Alloys

- Inconel 625
  UNS N06625
- Inconel 718
  UNS N07718
- Inconel 600
  UNS N06600
- Inconel 601
  UNS N06601
- Inconel 686

UNS N06686

Inconel X-750
UNS N07750

Monel Alloys

Monel 400
UNS N04400

Monel K-500
UNS N05500

Hastelloy Alloys

Hastelloy C-276
UNS N10276

Hastelloy C-22
UNS N06022

Hastelloy B-2
UNS N10665

Hastelloy B-3
UNS N10675

Hastelloy X
UNS N06002

Other Nickel Alloys

Alloy 20
UNS N08020

Alloy 625

Alloy 718

Alloy 825
UNS N08825

Alloy 925
UNS N09925

Iron-Nickel and High-Temperature Alloys

A286

- A-286
- UNS S66286
- EN 1.4980

Invar

- Invar 36
- Alloy 36
- UNS K93600
- FeNi36

Alloy 42

- Alloy 42
- UNS K94100
- FeNi42

Tool Steel and Specialty Hardened Steel

Tool Steel and Specialty Hardened Steel

- AISI D2
- AISI H13
- SKD11
- Cr12MoV
- AISI O1
- AISI A2
- AISI S7

SKD61
9CrSi

Structural and Construction Steel

Structural and Construction Steel

ASTM A36
Q235B
Q355B
S355JR
Q235C
Q355C
S235JR
S275JR
S355J2

Applications & Industries

Where Compression Spring are used, and what decides the specification in each case. Stocked from 0.6 to 5.0 (wire diameter).

Industries that specify Compression Spring

- **Mechanisms & latches** Return, detent and holding forces in moving assemblies.
- **Valves & actuators** Controlled opening or closing force.
- **Machine building** Take-up, cushioning and constant-contact duties.

Typical applications

returning a mechanism to its rest position
- maintaining contact pressure in an assembly

Need help matching Compression Spring to your application? Send the assembly, the load and the environment with your enquiry and we will specify the size, material and finish against them.

Technical Drawing

Customize the parameters below — every spec field is editable, and the drawing redraws to match the values you choose. Changing the size will snap the other fields to that size's standard values; you can then override any individual value.

Dimensioned line drawing of 0.6 Compression Spring — ISO / DIN (Series 146). Side view and top view, drawn to the dimensions in the table below and redrawn for any size selected.

Opens a short step to confirm the exact specification before you enter contact details.

Request a Quotation for Compression Spring (Series 146)

Click “Request this configuration” under the drawing to confirm the exact specification, then add your contact details. You can also send the request without a specification — but only an accurate selection gets an accurate quote.

Dimensions & Specifications (ISO / DIN)

Every row below is a starting point for the customizer above — pick any size and the drawing will redraw to that row.

Wire dia d (mm)	Outer diameter De (mm)	Free length Lo (mm)	Rate k (N/mm)	Rated
0.6	5.2	20	1.5	12
0.8	6.6	25	2.5	22
1.0	8.0	30	3.5	35
1.2	10.4	40	6.0	55
1.6	15.2	60	8.5	90
2.0	20.0	80	18.0	165
2.5	25.0	100	28.0	260
3.0	30.0	120	45.0	450
4.0	40.0	150	90.0	1000
5.0	50.0	200	170	1900

Compression Spring — ISO / DIN (Series 146) conform to ISO / DIN. As springs, they are specified by the dimensions in the table below; this page also covers materials, finishes and typical uses.

What Are Compression Spring — ISO / DIN (Series 146)?

Compression Spring — ISO / DIN (Series 146) are springs defined by ISO / DIN. They are selected by wire diameter and the dimensional characteristics shown below, and are available in a range of materials and finishes to suit the application and environment.

CAD Source Reference

This page is generated from an original native CAD part model (SolidWorks .SLDPRT) of the compression spring — iso / din (series 146) family maintained by our engineering team, covering 5 recorded size configurations. The technical drawing shown above is rebuilt parametrically from the dimensional table, so it always reflects the exact size and configuration you select. Native CAD files (STEP / SLDPRT) can be supplied with your quotation on request.

Materials & Finishes

Springs are supplied in spring steel, and in stainless (302/316) or phosphor bronze where corrosion or non-magnetic behavior is required. The controlling specification is the wire diameter, the spring rate and the free length; ISO 898-1 property classes do not apply.

Pricing

Compression Spring — ISO / DIN (Series 146) are supplied to order. Pricing starts from approximately US$0.15 per piece for standard sizes in spring steel; final pricing depends

on size, material, finish and order quantity (MOQ applies). Submit your exact configuration with the quote form above.

Custom manufacturing · Made to drawing

Need a compression spring outside the standard range?

Dimensions, material, finish and form are specified from the drawing — a spring outside the standard range is a variation on existing tooling rather than a new design.

Minimum order from 2,000 pieces; samples within 7 days of drawing approval.

Custom spring manufacturing (https://engineeringhardware.com/custom/springs/)

Send a drawing (https://engineeringhardware.com/custom/springs/#rfq)

Inside the plant

Manufactured in our own plant

This part is cold-formed, threaded, heat-treated and finished in-house. The stages below are where its class and finish are actually decided.

01

Cold heading

Wire rod is drawn to size and cold-formed into blanks. Forming rather than cutting keeps the grain flow continuous around the head, which is where a bolt is most likely to fail.

Head dimensions and under-head radius checked at set-up and per shift.

02

Thread rolling

Threads are rolled between hardened dies rather than cut. Rolled threads are stronger in fatigue than cut threads and hold pitch and flank angle far more consistently across a batch.

Go / no-go ring gauges to ISO 965 tolerance class 6g.

03

Heat treatment

Quench-and-temper brings carbon and alloy steel to the property class ordered — 8.8, 10.9 or 12.9 — with the furnace charge tracked so a finished lot can be traced back to it.

Core hardness and tensile tested per lot to ISO 898-1.

04

Surface treatment

Zinc, zinc-nickel, hot-dip galvanizing, black oxide, phosphate and Dacromet, selected against the service environment rather than against the price list.

Coating thickness and neutral salt spray hours to ISO 9227.

Video: Compression Spring

(https://www.youtube.com/watch?v=oBOQtSULo1E)(https://www.youtube.com/watch?v=oBOQtSULo1E)

► Watch video: https://www.youtube.com/watch?v=oBOQtSULo1E(https://www.youtube.com/watch?v=oBOQtSULo1E)

What Are Compression Springs and Where Are They Used?

(https://www.youtube.com/watch?v=oBOQtSULo1E)(https://www.youtube.com/watch?v=oBOQtSULo1E)

Third-party video, selected automatically for this topic. It is not produced by Engineering Hardware and is not a specification source — use the tables on this page for dimensional data.

Frequently Asked Questions

Which standard governs Compression Spring — ISO / DIN (Series 146)?

Compression Spring — ISO / DIN (Series 146) are manufactured to ISO / DIN. The dimensional values on this page follow that standard.

Which sizes of Compression Spring — ISO / DIN (Series 146) does Engineering Hardware supply?

The table on this page lists 10 sizes for Compression Spring — ISO / DIN (Series 146), ranging from 0.6 to 5.0. Sizes outside the table can be quoted on request.

In which materials are Compression Spring — ISO / DIN (Series 146) supplied?

Compression Spring — ISO / DIN (Series 146) are supplied in spring steel SH/DH and stainless, with finishes including zinc plating, hot-dip galvanizing and black oxide. Choose material and finish to suit the load and the service environment for Compression Spring — ISO / DIN (Series 146).

How do I request a quotation?

Use the parametric drawing on this page to set the exact configuration (size, material, finish) and click "Request this configuration" — a specialist from Engineering Hardware will respond within one business day.