



# SPRING STEEL

Order range

The following material can be ordered for delivery. Contact our materials department for pricing and delivery times.

For chemical analysis and other data, see pages 210–211. Please ask for information on tolerances.

Spring material is supplied from our unit in Sweden and cannot be delivered in conjunction with other standard products.

## **STRIP STEEL SS 1770, DIN 1.1231, W.NR CK 67**

CK 67 is a standard quality in spring strip steel, with no corrosion resistance requirements.

Available both as unhardened and hardened.

Operating temperature: -40 – +120 °C

Tempering instruction: Heat to 800–820 °C, cool in oil.

Temper for approx. 30 min at 400 °C, cool in air.

## **STRIP STEEL SS 2230, EN 10089 51CrV4, W.NR 1.8159**

High strength spring steel for high pressures and temperatures with a good relaxation limit. We keep a stock of the unhardened steel, which requires tempering after shaping.

Operating temperature: -40 – +225 °C

## **SPRING STEEL SS 2331-06, EN 10270-3-1.4310, DIN 17224: X12 CrNi 17 7**

Hard drawn stainless wire with good spring qualities for general use and suitable for bending.

Should be tempered in 250–350 °C after shaping.

Operating temperature: -150 – +250 °C

## **SPRING STEEL SS 2347, EN 10270-3-1.4401, DIN 17224: X5 CrNiMo 18 10**

Hard drawn acid proof wire and hard rolled strip suited for naval applications, provisions, medicine and other environments where higher demands for corrosion resistance are required. Slightly lower tensile strength than stainless SS2331. Good for bending.

Should be tempered in 250–350 °C after shaping.

Operating temperature: -200 – +300 °C

## **SPRING STEEL SS 2388, EN 10270-3-1.4568, DIN 17224: X7 CrNiAl 17 7**

Stainless hard rolled strip, which after tempering increases in tensile strength by approx. 350 N/mm<sup>2</sup>. This facilitates shaping as it can be performed on a softer material. The steel has excellent spring qualities with enhanced strength and a lower relaxation, even at higher temperatures.

Operating temperature: -200 – +350 °C

## **TIN BRONZE SS 5428-7, DIN 17670/17677: SuSn6**

Tin bronze (phosphor bronze) is a non-magnetic corrosion resistant spring material for low loads.

Operating temperature: -200 – +80 °C

## **BERYLLIUM COPPER CuBe 250, DIN 17670/17677: CuBe2**

Beryllium copper is a non-magnetic acid proof spring material with excellent spring qualities.

This medium-hard material is easily formed, after tempering optimum spring hardness is achieved. The gas emitted during heat treatment is toxic, therefore it is important to provide good ventilation.

Operating temperature: -200 – +150 °C

## **SPRING WIRE STATO 70, EN 10270-2-FDSiCr, DIN 17223-2: FDSiCr**

Stato 70 is high strength oil hardened valve spring steel. A high class spring steel for highly stressed springs. Bending is possible down to a radius equal to the wire thickness. After shaping, tempering should be done at 300–400°C. Handle carefully when supplied in ring as the wire may straighten when released.

Operating temperature: -60 – +250 °C



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## Inconel X-750

A nickel-chrome alloy, made precipitation hardenable with high creep rupture resistance at increased temperatures up to 700 °C. The material is available from stock in wire and sheet form, but also straight lengths and strip can be supplied. Our stock wire is compliant with the spring temper AMS 5699 standard, which gives higher strength but at lower operating temperatures.

Tempering must be performed to take full advantage of the mechanical qualities. Applications include nuclear reactors, gas turbines, rocket engines, vehicle components and the aircraft industry.

Operating temperature: Wire AMS 5699, - 200 – +300 °C  
Sheet AMS 5542, - 200 – +550 °C

## Nimonic 90

A precipitation hardenable nickel-chromium-cobalt alloy, having high stress-rupture strength and creep resistance at elevated temperatures up to about 950 °C. For springs exposed to lower loads, the material can be used up to 700 °C.

Nimonic 90 offers good resistance to corrosion and is non-magnetic. Applications include the aircraft industry, gas turbines, vehicle components and springs in high temperature environments, and thermal processing. Our stocked standard programme covers cold drawn wire and cold rolled strip. Full mechanical properties are obtained after heat treatment.

Operating temperature: -100 – + 550 °C

## Inconel 718

A nickel-chromium precipitation hardenable alloy with a high resistance to relaxation and creep ruptures at temperatures up to 700 °C. This non-magnetic alloy has a higher strength than Inconel X-750 and better mechanical properties at lower temperatures than both Nimonic 90 and Inconel X-750.

Suitable for applications involving elevated temperatures in corrosive environments such as gas turbines, rocket engines, space and aero industries, oil and gas extraction, nuclear reactors and pumps. For spring applications, this material requires heat treatment to optimise its mechanical properties. Inconel 718 can easily be welded and is especially resistant to weld induced strain age cracking.

Operating temperature: -200 – +550 °C

## Hastelloy C-276

A nickel-molybdenum-chromium alloy with the addition of tungsten which has excellent resistance to strong oxidisers, hot concentrated mineral acids and a wide range of corrosive environments, and is especially resistant to pitting and crevice corrosion. Applications include pollution control, waste treatment, pulp and paper production, and seawater.

Cold drawing or cold rolling Hastelloy C-276 optimises tensile strength values, which cannot be increased by heat treatment. Tempering at 450 °C (max) is however recommended, in order to relieve stresses generated during the shaping process.

Operating temperature: -100 – +200 °C

## MP 35 N

A nickel-cobalt based alloy that has a unique combination of qualities including ultra high strength and ductility, and also outstanding corrosion resistance. MP 35 N resists corrosion in hydrogen sulphide, salt water and other chloride solutions. It also has excellent resistance to crevice and stress corrosion cracking in sulphuric liquids, seawater and other hostile environments.

MP 35 N is recommended for applications where a combination of high strength and high corrosion resistance is required. It must be heat treated in order to achieve its full mechanical properties.

Operating temperature: -200 – +315 °C