LESJÖFORS
SPRINGS & PRESSINGS

SPRING TECHNOLOGY

The performance of your spring or strip component is crucial for the function of your application. To determine the products performance, Lesjöfors makes calculations and simulations that later are verified through measuring and testing. We have the capacity to calculate measure and test all types of springs, from very small and thin strip components to several hundred kilo heavy coil springs.

Complete development partner

At what temperature will your spring operate? Even a small divergence from room temperature can affect the performance of the material. Is there a risk of corrosion? The most common spring problem is corrosion. Different environments require different materials and/or surface treatments. Lesjöfors´ spring experts can give you advice and recommendations for the best possible performance of your spring.

Examples of spring materials that we work with

- Cold drawn and cold rolled low-alloy steel
- Hardenable spring steel
- Stainless spring steel
- Copper alloys
- Super alloys
- Titanium alloys

Your custom springs require a specific design considering stresses within the body in one or more of the three normal planes. Different spring materials have different properties such as Young's (elasticity) modulus, shear modulus, yield, fatigue and creep strengths. Mechanical and strength calculations are used to find a design of the spring which gives the spring performance you are expecting. Lesjöfors verify the design by measuring and testing the parameters that are important for your specific spring. Naturally, we carry out capability studies to determine the Cpk of critical dimensions.

Facts

- Lesjöfors measures and tests springs at 13 different locations in Europe and China.
- Lesjöfors employs 25 engineers and spring technicians that work on technical and customer support.
- Lesjöfors has the ability to measure and test the performance of all items in our product range.

SPRING TECHNOLOGY

Spring geometry:

- Tolerances according to current international standards or better
- Measurements with digital technology
- Measurements with spring specific equipment
- Measurements with vision technology
- Measurements with laser scanning

Spring technological customer support

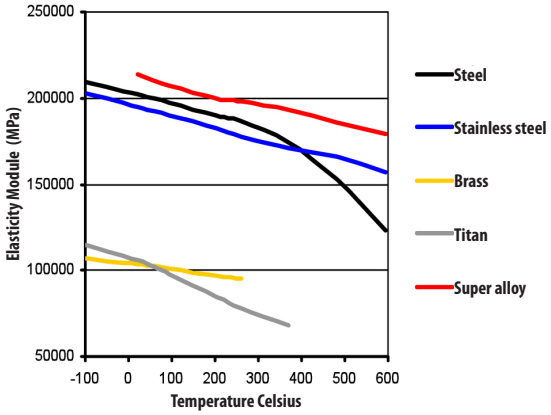
Lesjöfors´ network of spring expertise include areas such as material, surface treatment, dimensioning, prototyping, manufacturing, testing and quality assurance. We cooperate with world-leading spring material suppliers and have access to material data for the best spring materials. We use the most up to date methods to support you during your design of your specific spring. Our spring engineers work in close cooperation with our customers.

Fatigue

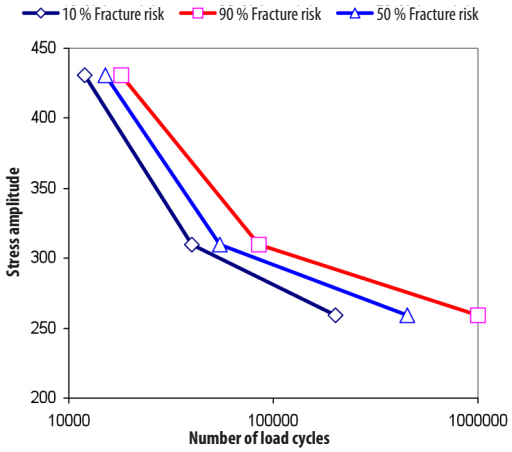
For working springs in a dynamic application there is often a need to know if the spring will live up to its lifespan requirements. Or you may want to know the fatigue limits for the spring. Materials show a wide distribution of fatigue strength which must be considered in every application.
Therefore, the need for life reliability must be discussed and the probability that the spring will perform in application can be evaluated from its materal properties and the stresses within the spring. Probability science and statistic methods are used to evaluate life reliability. Fatigue strength data published by the material manufacturers is always given with a certain life or fracture probability. Lesjöfors perform fatigue tests for all types of springs in special test machines for springs that require life cycle testing.

Relaxation/creep

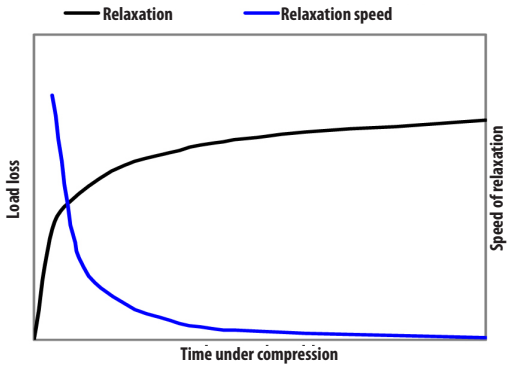
A physical feature of metals is that even when they are stressed to below the yield point (elastic limited) there maybe permanent plastic deformation. The phenomenon occurs with both static and dynamic stress. The rate depends on the metals properties, the stress level, time and temperature. For spring types and applications where the relaxation/creep leads to reduced stress, the rate decreases to zero, while in other cases the rate follows a normal relaxation/creep process. With the help of our experience in materials and spring data we can support you with relaxation/creep data for your spring. Lesjöfors has also the capability to perform relaxation/creep tests for all items in our product range.



E-modules at different temperatures.



Example of the spread of fatigue strength for a steel (S-N curves).



Relaxation and speed of relaxation for a compression spring at a constant compressed length.

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