

6 Forming solutions

Watch Springs



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APPLICATION

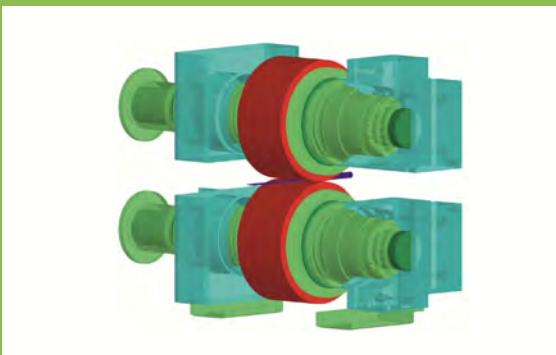
Watch Springs

Mechanical watches require springs to store energy and to provide a precise timing. Both in hand-wound and automatic watches the key part is the balance spring. The more precise this spring, the more accurate the timing of the watch. Typical balance springs are made from Fe Ni alloys, with a thickness variation in the range of 100 nanometer.



PROCESS

Ultra Precision Rolling Mill



Incoming precision drawn fine steel wire is flattened in a series of roll stands:

- . Payoff, max. 0,50 kg
- . 2x special design roll stand, 2-HI,
- . 60 mm roll dia, tungsten carbide roll rings, 25 mm wide
- . Rolls mounted in sleeve bearings
- . Bearing oil lubrication circuit
- . Manual screw-down for pre-adjustment; fine adjustment and AGC by special electronic control system
- . Weight loaded precision dancers, ultra light version
- . Ultra precision thickness control, contact gauge
- . AGC automatic gauge control
- . Precision layer winding take up, max. 0,50 kg
- . Special design roller cassettes allow grinding of rolls within own bearings

LAYOUT



PRODUCT

Flat Spring Wire



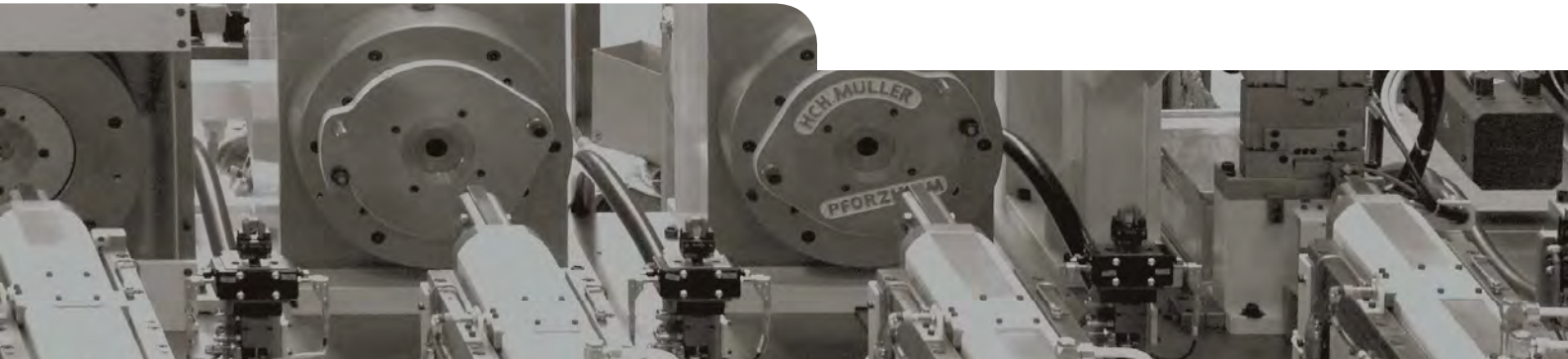
- . Ultra precision cold rolled steel flat wire
- . Thickness 0,020—0,20 mm
- . Width 0,10—2,0 mm
- . Thickness tolerance +/- 0,05 μ
= +/- 50 nm
- . Rolling speeds 0—25 m/min
- . Max. roll force 30 kN
- . Integrated thickness measuring / SPC system
- . Installation in climatized room



Forming solutions by HMP, Germany



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ROTARY SWAGING



AXIAL FORMING



DRAWING



ROLLING

FORMING WITH CONCEPT

HMP is an established integrated solution supplier and technology leader due to its well engineered experience in the international markets.

For many different project applications HMP creates flexible and economical solutions. The realization of forming processes with Net Shape requirement and short process chains has been our business for 100 years.

We supply components ready to be installed, forming machines and complete production systems of highest quality.

DEMANDING SOLUTIONS

Satisfied customers in numerous industries confirm the success of our achievements.

Thus our customers profit from our expertise going back many years, for example in:

- . Automotive industry
 - . Aircraft industry
 - . Optical industry
 - . Medical technology
 - . Jewelry industry
 - . Wire & cable industry
 - . Textile industry
- and in many other industries.

SUCCESSFUL TRADITION

In order to satisfy demanding market requirements, we offer as group an extensive spectrum of expertise to you.

HMP Maschinenfabrik: Innovative development, construction and production of high performance forming machines and systems for various production processes: Rotary swaging, Axial Forming, Rolling, Drawing

HMP Umformtechnik: Development and realization of innovative processes through efficient production of small and large workpieces, simultaneous engineering, flexible prototype manufacturing, high quality forming dies

MECHANICAL ENGINEERING IN PERFECTION

The machine segment is our core business. Our main target is it to manufacture for our customers machines of superior quality. We are aiming at achieving utilization at the highest possible level and keeping the running cost as low as possible. Therefore we invest a major amount of time into the selection of functional components and realize technical solutions which exactly suit the high quality requirements of our customers.

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