

We are what we achieve

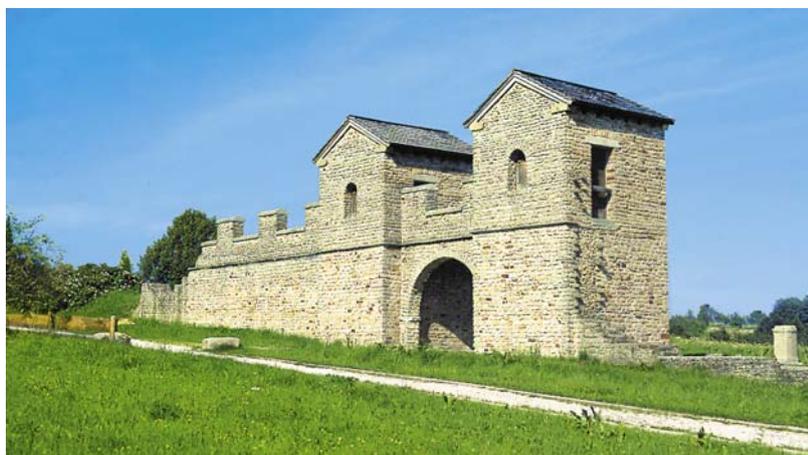


Spanning the heights between Heaven and Earth



1.1 Via Hightech on the Via principalis

The Roman fort – Ostkastell – in the middle of the Swabian landscape forms part of the Upper German Limes



Spanning through antiquity into the future.

Fascinating but true: The machines used to produce today's disc springs stand on soil whose history stretches back into antiquity. The Via principalis (main road) to a Roman Limes castle runs right through the Christian Bauer grounds. History lives on amongst the makings of a high-tech future.

Boundaries have a very special significance of their own. Those who know where the boundaries are often discover a world of fascinating possibilities on the other side. Here, where antiquity meets the space age, disc springs have been produced in a wide variety of different types and finishes since 1940. Hightech from Welzheim enjoys international repute, and is an indispensable key for wide-ranging applications: From the finger-sized Lambda probe through to heavy-duty units for disc brakes used in conveying equipment, from domestic irons to aerospace engineering. And the applications for disc springs are growing all the time.

Spanning every aspect of quality: Gold set the first standard.

Christian Bauer, who founded the company in 1880, was a Swabian entrepreneur whose pioneering spirit saw his goldsmith's workshop grow in just a few years to become a small jewellery factory. Its products soon earned themselves a solid reputation.

His sons took over the reins of management. The First World War slowed down but failed to halt the company's development: In 1925, "Ringfabrik Bauer" launched series production of gold rings. The company's excellent reputation grew and flourished – as did the factory and the workforce. Still on a steady course of expansion, the company celebrated its 50-year jubilee in 1930.

The Second World War interrupted the development of jewellery production. The factory had to be given over to the manufacture of armaments.

Handling gold and other precious metals calls for highly disciplined thought and action. On the basis of its comprehensive experience in metal processing, the company was able to successfully establish a new field of production: The manufacture of disc springs. Post 1945, the disc spring range was continued as a separate and independent manufacturing division.

In postwar Germany, initially a domestic sales network was established, which was then expanded to the rest of Europe. It was not long before the company's sales activities spread overseas.

With the sixties came the first power-assisted steering systems in cars. The vane pumps needed for this technology were equipped with vanes produced by Christian Bauer. This launched production of the first precision parts to be manufactured and made with tolerances in the micrometer range by the company.

Decades of expertise in development and production have culminated in ever more individual and standardized spring elements and precision parts whose material and function comply with the most stringent requirements. The core business fields of our technical segment include

- ▷ Disc springs, ball bearing disc springs
- ▷ Slotted disc springs, wave springs
- ▷ Disc spring stacks
- ▷ Fastener Bellevilles to DIN
- ▷ Special spring elements
- ▷ Spring clips for pipe connections
- ▷ Blanked and precision blanked parts
- ▷ Precision parts

***New, previously
inconceivable solutions.***

Tomorrow's needs and the international marketplace make ever new demands on product development. We are pleased to be of service in the configuration and manufacture of ideally optimized solutions.

And development never stops. Today, Christian Bauer is a major player in the industrial society of Southwest Germany, as a producer of both jewellery and disc springs. We are a manufacturer of international repute. We are Christian Bauer.

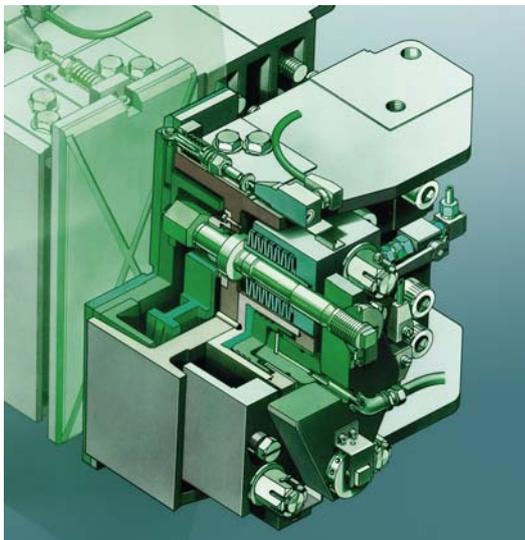
Expertise in development and production have culminated in an ever greater number of spring elements and precision parts complying with stringent material and functional quality standards.



CB disc springs in a lambda probe.



CB disc springs exposed to extreme loads in a conveying equipment braking system.



CB disc spring stacks



Spanning every aspect of quality: From responsible advice through to certification.

In a manner of speaking, pride in our high standard of quality is the cornerstone of the Christian Bauer GmbH + Co. KG company building.

Quality starts with the highly qualified workforce, with their careful selection and training to the point where they are competent to assume responsibility for their assigned task - from customer advice through to regular quality inspections.

A decisive factor determining quality is the selection of materials and their process reliability. Quality assurance is effectively supported by computer-aided monitoring and measuring equipment to test spring characteristics, service life and setting properties. In brief: their suitability to comply with the most stringent demands. State-of-the-art methods such as FMEA, machine capability studies and SPC guarantee reliable quality assurance from start to finish.



Ball cock valve fitted with CB disc spring stack

High-tech to NASA standards not only benefits high-flying technologies but also the manufacture of products with their "feet on the ground", such as the humble domestic iron or the flexible fixture used to attach the wing mirror to your car.

The principle we work to is called Quality plus X. We make the ordinary extraordinarily good – because we know that today's customer is not satisfied with anything less than perfection. The precision parts we manufacture have tolerances in the micrometer range. We work using laser technology, measured data acquisition, with hydraulic presses up to a press force of 8,000 kN, with computer-monitored throughfeed annealing ovens. And at the end of production, all the process water used is treated using environmentally friendly methods and returned to circulation as pure water.



CB disc springs in a drilling machine coupling

View of the company premises in Welzheim.





1.2 Certification

Our quality management mission is all about **“Pre-serving what exists, and improving what’s new”**. The pledge we make to our customers to maintain an effective Quality Management System in accordance with industry-specific rules and regulations is verified at Christian Bauer by the following certifications and approvals:

- ▷ ISO/TS 16949
- ▷ ISO 9001
- ▷ Kunden-Spezifikationen

СЕРТИФИКАТ ◆ CERTIFICADO ◆ CERTIFICAT



CERTIFICATE

The Certification Body
of TÜV Management Service GmbH
certifies that

Christian Bauer GmbH + Co. KG
Schorndorfer Straße 49
D-73642 Welzheim

has established and applies
a Quality Management System for

**Development, manufacture and distribution of
disc springs to DIN 2093; Bellville washers to DIN 6796
and specials to customer requirements; precision components e.g.
for power steering pumps; special parts to customer requirements**

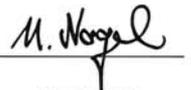
An audit was performed, Report No. **70016410**
Proof has been furnished that the requirements
according to

ISO 9001: 2000

are fulfilled. The certificate is valid until **2007-12-08**
Certificate Registration No. **12 100 22957 TMS**



Munich, 2004-12-15





TGA-ZM-07-92

Management Service GmbH - TÜV SÜD Gruppe - Zertifizierstelle - Ridlerstrasse 65 - 80339 München - Germany

ZERTIFIKAT ◆ CERTIFICATE ◆ 認証証書 ◆ CERTIFICADO ◆ CERTIFICAT



Enclosure 1 of Certificate No.: 12 111 22957 TMS
IATF Certificate No.: 0039388

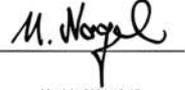
of 2004-12-15

Christian Bauer GmbH + Co. KG
Schorndorfer Straße 49
D-73642 Welzheim

**Following additional Customer-Specific Requirements
were audited and are fulfilled:**

DaimlerChrysler	Special Terms
Volkswagen	Formel-Q-Konkret
Bosch	Qualitätssicherungs-Leitlinie für Lieferanten QSL
DCP (Diesel CommonRail Products)	VDA Bände 1-6
ZF Lenksysteme	QR 83, QP 98





Munich, 2004-12-15



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TÜV Management Service GmbH - TÜV SÜD Gruppe - Zertifizierstelle - Ridlerstrasse 65 - 80339 München - Germany

ZERTIFIKAT ♦ CERTIFICATE ♦ 認証証書 ♦ CERTIFICADO ♦ CERTIFICAT



Management Service

CERTIFICATE

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of TÜV Management Service GmbH
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Schorndorfer Straße 49
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and specials to customer requirements; precision components e.g.
for power steering pumps; special parts to customer requirements**

The audit was conducted in accordance with the
"Rules for the registration scheme
for ISO/TS 16949: 2002, 1st Edition."

An audit was performed, Report No. **70016410**
Proof has been furnished that the requirements according to

ISO/TS 16949: 2002

and the Customer-Specific requirements as
listed in enclosure are fulfilled.

The certificate is valid from **2004-12-09** until **2007-12-08**

Certificate Registration No.: **12 111 22957 TMS**

IATF Certificate No.: **0039388**



Munich, 2004-12-15



2-IAO-QMC-01004



1.3 From production

The company Christian Bauer develops and produces with a workforce totalling around 340 (status 2005). Through the use of state-of-the-art technologies, an on-going exchange of experience and by placing its customer's needs firmly at the focus of its activities, Christian Bauer is clearly distinguished from other, production-only companies. Use of the very latest test methods ensures comprehensive quality assurance at every stage. This is actively organized and further developed by the company's workforce, and rests on a solid foundation of qualification through training, team spirit and motivation.



Our processes and products are designed and optimized using 3D CAD and FEM calculation methods.



Teamwork is the best to quality achievements.



The company's employees run quality checks on their own initiative.

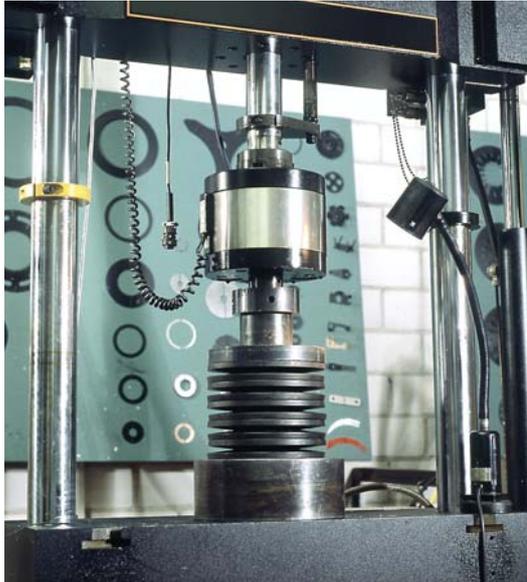
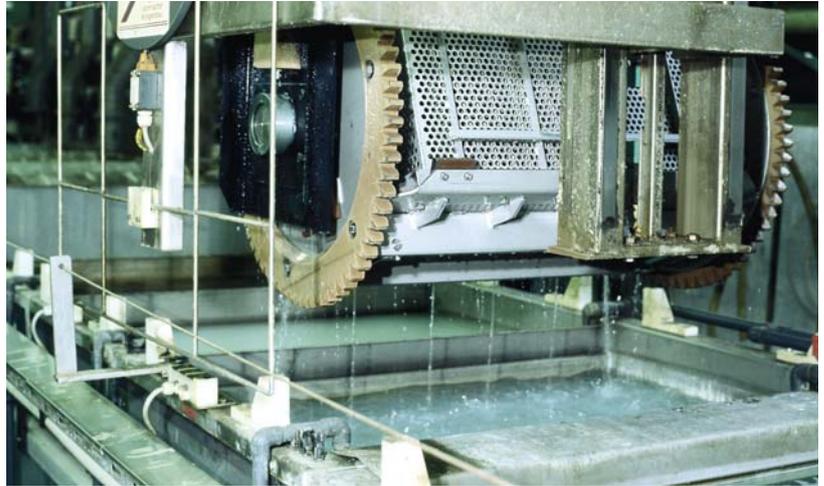


Numerically controlled hydraulic presses up to 4000 kN pressing force.



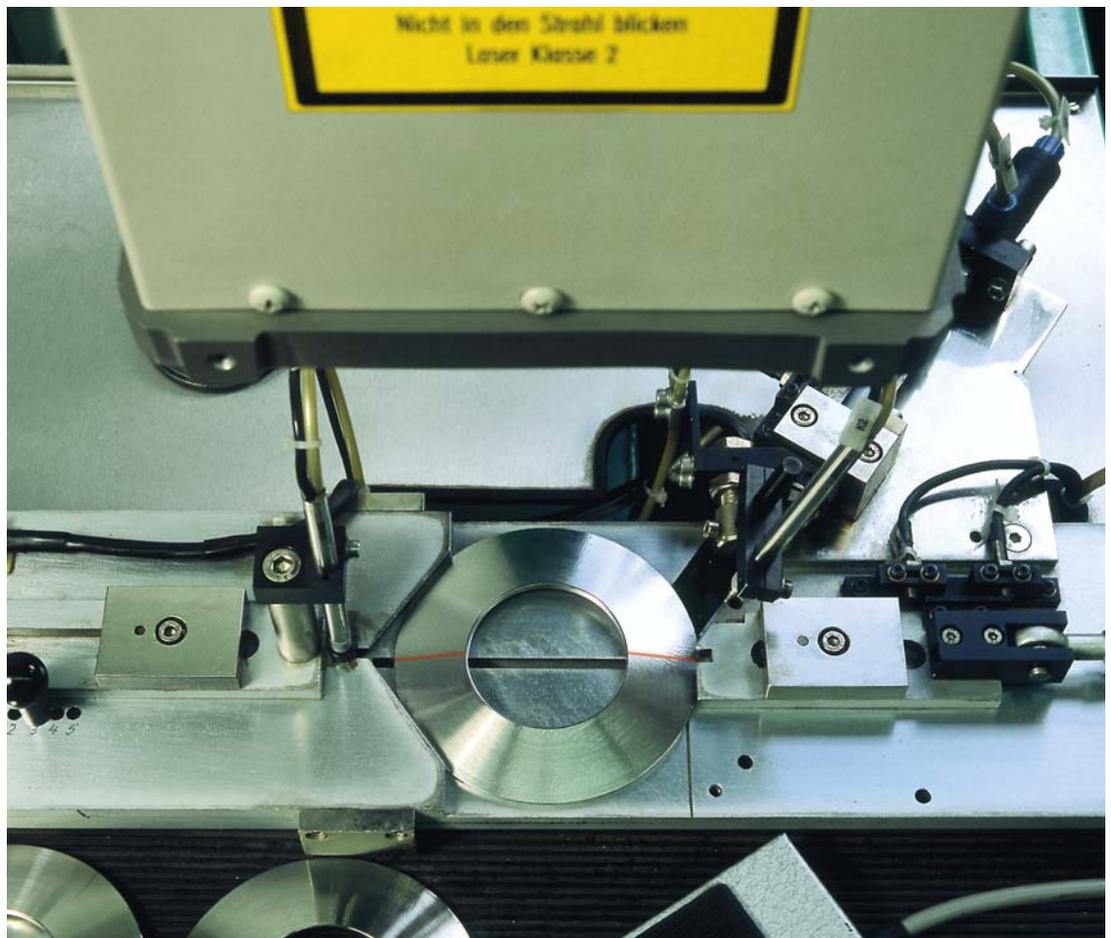
State-of-the-art continuous hardening ovens are computer monitored to ensure a stable heat treatment.

Corrosion prevention treatment plant.



Computer-controlled testing equipment is used to record spring characteristics, and determine endurance life and alternating stress response, also under operating conditions.

During final inspection, state of the art laser technology is used to measure and document the spring dimensions.





Determination of spring load with integrated measured data acquisition and documentation at the spring testing machine.



The company develops and manufactures disc springs and spring elements with practically any required characteristic.



By computer monitoring all the produced process water and with an environmentally friendly disposal system, the company makes a decisive contribution to environmental conservation.



***Locations of
Christian Bauer GmbH+ Co. KG
for disc springs and precision parts:***

- ▷ Welzheim plant
- ▷ Sales companies in
 - Redditch, UK
 - Pittsburgh, PA, USA
- ▷ Agencies in 21 countries around the world



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