Manufacturer of precision springs for high performance applications
Maximising Spring Performance

Performance Springs is an engineering-driven spring manufacturer, standing for innovation, quality and technical excellence.

Performance Springs offers expert advice in order to develop innovative technical solutions to maximise spring performance and avoid the risk of failure.

Springs produced without expert design input can fail. Although springs may look simple, they actually have complex dynamics - particularly when used for demanding applications such as engine valve springs and fuel injector springs.

The analysis and fine-tuning of spring design can result in a dramatic improvement in durability. Valve springs in particular benefit from such expert design input, resulting in increased engine valvetrain efficiency, lower emissions, reduced fuel consumption and improved reliability.

This brochure provides information about a number of aspects of our spring manufacturing service that can offer significant benefits to our customers.

Prevention of spring problems leads to significant cost savings.

Services

Performance Springs works closely with OEMs and Tier 1 suppliers in sectors such as premier automotive, large diesel, hydraulics and fluid handling, manufacturing high duty springs used in products such as engine valves, fuel injectors, clutches, powertrain, steering systems and hydraulic valves.

We offer the following services to our clients:

- Technical review
- Design
- Testing
- Failure analysis

We have an in-house laboratory, where we undertake fast prototyping of new products. Our effective logistics cope with complex orders, ensuring on-time delivery.

We are committed to continuous improvement and lean manufacturing.
Technical Review

We are delighted to carry out technical reviews for both new and existing customers.

A technical review can make a spring more efficient and more reliable. A technical review involves our spring designers working closely with the customer’s engineers in a design partnership to enable full understanding of the spring function within the application. We will then be pleased to offer advice along with potential solutions.

Technical reviews include:
- Spring Drawing & Design
- Tolerancing
- Material Selection
- Stress Analysis
- Goodman Diagrams

We continue to grow our business by assisting our customers with their technical challenges.

Design

All our products are bespoke and the company uses a range of Computer Aided Design (CAD) facilities at the design stage, including 3D modelling and Finite Element Analysis (FEA).

Innovative and Experienced Design Engineering Team

We work in close partnership with our customers from the initial design concept, through prototyping to volume production. With highly experienced design engineers and with extensive knowledge of material selection we are able to optimise the design specification to suit the customer’s individual requirements.

We offer advanced design services such as:
- CAD Spring Design
- Fatigue Life Prediction – Goodman Diagrams
- Spring Design Optimisation
- 3D Design Modelling
- FEA Finite Element Analysis
- Dynamic and High Dynamic FEA Meshing and Animation
- Dynamic Stress Analysis
- Dynamic Non-Linear Analysis
- Cam Cover and Moving Mass Analysis for Engine Valvetrain
Testing

Performance Springs has a comprehensive range of innovative testing equipment, including multi-station fatigue testing, non-destructive crack testing and engine head testing.

With our own research and development department, we work closely with customers to develop new bespoke testing equipment for specific applications.

- Laboratory Testing Service
- Spring Measurement Testing (i.e. Load/Rate-Length Curves)
- Fatigue Testing – Multi Station (elevated temperature option, subject to size)
- Engine Head Testing
- Dynamics and Resonance Testing
- Magnetic Penetrant Crack Testing
- Failure Analysis Service

Failure Analysis

Performance Springs has a comprehensive Metallurgical Laboratory that offers advanced analysis of your spring problems to recommend innovative solutions.

State-of-the-art digital microscopes, with high depth of field and 3D image reconstruction, enable us to offer some of the best facilities available for spring fracture analysis, to ensure we find the true root cause of your spring problems.

- Fracture Analysis
- Fractography
- Metallography
- Digital Microscopy
- Scanning Electron Microscopy

Stereo Microscopes
Compound Digital Microscopes
Extended Depth of Focus (EDF)
3D Image Reconstruction and Measurement
Scanning Electron Microscope (SEM)
Advanced 3D Design & Finite Element Analysis (FEA)

Performance Springs utilises the latest in Siemens’s advanced 3D design and finite element analysis (FEA) software.

**LATEST SOFTWARE**
Performance Springs utilises the latest in Siemens’s advanced 3D design and finite element analysis (FEA) software.

**DESIGN PROCESS**
The analysis packages are used during the design process for the latest sophisticated compression springs, for instance beehive springs for high speed race engines.

**STRESS ANALYSIS**
Using 3D software modelling, parts can be meshed and animated. Stress analysis is then carried out which allows the designers to define the best spring shape and profile for manufacture. Static, dynamic and high dynamic analysis is possible.

**HIGHER FATIGUE LIFE**
This process ensures that springs manufactured by Performance Springs are optimised for a higher fatigue life and spring damping is highly efficient for aggressive dynamic environments.

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“We switched to Performance Springs for the supply of the valve springs for the last order, we had a number of issues with valve springs for the last three years but have had no complaints since using yourselves.”

WORLD RALLY TEAM
Almost 50% of our products produced are exported throughout the world to regions including: Western Europe, North America, Asia, Middle East, Far East, Eastern Europe, South America, Australasia, Africa.

Market Sectors

We supply springs for high risk and high duty applications to some of the world’s most prestigious organisations, delivered on-time globally.

Vehicle Industry
- Premier Passenger Cars
- Motorcycles
- Race Cars
- Specialist Passenger Cars
- Light and Heavy Trucks
- Locomotive Power
- Marine Power
- Off Highway & Construction
- Industrial Power
- Defence Vehicles

Hydraulic Power & Fluid Handling
- Valve, Pump, Motor & Actuator Manufacturers
- Power Generation
- Mining Industries
- Chemical Manufacturing
- Food & Brewing Industries
- Rail Track Systems

Excellent…
Great support and service, you are not the norm in this regards I can assure you…

CLUTCH MANUFACTURER
Performance Springs supplies the highest quality spring products to some of the world's most prestigious organisations for applications including...

- Compression Springs
- Engine Valve Springs
- Fuel Injector Springs
- Clutch & Transmission Springs
- Suspension Springs
- Hydraulic Power Springs
- Fluid Handling Springs
- Circlips
- Brake Systems Springs
- Steering System Springs

Products

Manufacturing Capability

Performance Springs uses the best business systems and innovative manufacturing processes to ensure the most consistent and capable products at volumes from one to millions.

Approvals
- Quality Management ISO9001
- Automotive Quality Management TS16949
- Environmental Management ISO14001
- Health & Safety Management

Manufacturing facilities include:
- Tight Tolerancing
- CNC Coiling Machinery
- CNC Grinding Machinery
- Chamfering
- Heat Treatment
- Shot Peening
- Hot and Cold Prestressing
- Inspection
  - In-line inspection (Lean process)
  - Final Inspection – suitable for direct line feed
Performance Springs is the UK's premier designer and manufacturer of made to order, high quality, precision spring products. Housed in a modern factory and using the latest technology and state-of-the-art equipment, combined with the unrivalled knowledge and expertise of its management team, Performance Springs is a leading innovator in the field of high performance spring technology. The company is committed to growth and investment in both its workforce and the manufacture of wire and sheet metal related products.

"To Delight our Customers with Excellence in Quality, Delivery, Sales Service and Technical Ability and be a Profitable World Class Specialist Supplier of Precision Springs."

PERFORMANCE SPRINGS VISION STATEMENT
Challenge us with your most difficult spring application problems!