



Empowering the global spring industry



The full service spring specialists

We have been empowering businesses to create safer, more reliable and more effective springs since 1942. Through software, testing, training and consultancy, we are able to share our experience and technical know-how. We guide businesses with professionalism, confidentiality and impartiality.

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Software

Spring Calculator Professional (SCP) is the world's leading spring design software. Already used by hundreds of companies globally, SCP has simplified a large portion of spring design and validation helping to highlight potential problems before a spring is even manufactured.

The extensive fatigue life and relaxation predictions built right into the software are unsurpassed and invaluable for users validating springs for use under real-world constraints.

The impact of changes in materials, design standards and spring parameters can be quickly and simply evaluated, analysing this impact is essential to manufacturers, design engineers and end users across the globe.

Who is SCP For?

Spring Calculator Professional is for anyone involved in the spring making process from design to manufacture. Its is extensively used across the globe by spring manufacturers and design engineers in the following areas:

- Automotive, transport and aerospace
- Oil, gas, energy and defence
- Equipment, heavy machinery and agriculture
- Medical equipment
- Control systems, valves and hydraulics

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We've built over 70 years of research and data right into SCP giving you access to an extensive range of material performance data and fatigue life and relaxation predictions. Using this data the software can predict the behaviour of a spring under different environmental and operating conditions. Furthermore it allows a design to be honed to fit with real-world constraints, such as limited space for a spring in finished equipment.

We've integrated the most used spring types into the SCP software suite. Choose from compression, extension, torsion, conical, rectangular wire, non-standard, disc, spiral and wave spring types. Pay only for the ones you need and not the ones you don't.

Create springs to a range of international standards – including BS, DIN, EN, SMI, IS and JIS. Wire data is available to BS, DIN, EN, ASTM, AMS, IS and JIS specifications, as well as selected commercial grades.

Define your own units and adjust the interface to your needs. Modify output files to match your company's style and export to Word, Excel, CSV or Text file. Gain valuable business insights through our Data Reporting tool.

There's more customisation available, create your own design standards and add in your own calculated outputs. The built-in report designer allows you to easily create your own print templates to tailor the outputs you give your customers.

SCP is a powerful and comprehensive piece of software engineered for professionals to make spring design easier, smarter and more cost efficient.

For a free 7-day trial visit ist.org.uk/software/trial/

Training

Educating the world about springs!

We offer a number of training options, from self paced e-learning courses, CPD courses, in-house training, to our renowned popular practical design training course.

All of our training courses are aimed at everyone within the spring industry including manufacturers, material suppliers as well as designers and users of springs.

From our experience of getting out and talking to our members, we've found there are two issues we see occurring over and over again. One of these is the basic understanding and appreciation of how important springs are to all our lives, and the other is the growing gaps in skills and experience in our industry.

So we set out to invest in the creation of a number of resources. Firstly, we commissioned a series of bite-sized short videos to both raise interest and awareness, and explain some of the topics around springs – both technical and not. Secondly, we are busy writing further e-learning modules to complement our existing training courses, so that those who cannot find the time or money to attend a full course can learn about individual topics.

BITE-SIZED VIDEOS

Our free videos cover a variety of topics including: spring materials, spring design, testing and failure investigation.

ist.org.uk/online-learning/videos/

High-impact, real-world training for the spring industry

OPEN TRAINING

Based on decades of experience in training the spring industry, Practical Spring Design is our regular scheduled course. We deliver it 2-3 times each year, generally online over Zoom.

We teach you the basic background theory (without overwhelming you with equations!) for all the main spring types, and hints and tips on how to design. We focus on spring materials, their properties, and spring failure – you will understand the mechanisms of failure and how to prevent them.

The course lasts two days and includes workshop exercises where you can design springs to cement what you have learned.

ist.org.uk/training/open-training/

SPRING E-LEARNING

Our self paced e-learning modules cover compression springs, spring materials, extension springs and failure. The courses can be taken at anytime, anywhere that fits in with your busy schedule. It is ideal for spring manufacturers, design engineers and spring end users.

On average, each course can take up to 2 hours to complete, and you will receive a certificate upon completion. The learning can be accessed from mobile, tablet, laptop or PC.

ist.org.uk/online-learning/e-learning/

Train anytime, anywhere

IN-HOUSE TRAINING

For something a little more unique, we can deliver in-house training to you anywhere in the world and tailor the course to suit your requirements. These courses are designed to meet your own company's training needs/requirements.

These courses are specially designed to meet your own company's training needs and can be performed anywhere in the world. The In-house courses can be constructed from any parts of our standard course and are tailor-made to incorporate any, all or a mixture of the modules, as well as elements from your own product range and commercial requirements.

ist.org.uk/training/in-house-training/

Testing

IST is an internationally recognised test house. We have the expertise and testing laboratory facilities to conduct a comprehensive range of dynamic and static spring tests to support your business. Testing springs is crucial to ensure they perform as designed and maintain their performance over time. Ultimately preventing failures and ensuring product safety and reliability.

Independent spring testing gives you confidence in your products and design. Our laboratories contain a unique range of both static and dynamic testing equipment, much of which is designed and built in-house to fulfil the most exacting accuracy requirements.

Should you have a requirement to independently test your springs, or you don't have in-house capabilities, please get in touch and we can discuss your specific requirements. We will always try our best to cater to your needs, and we'll provide a quotation and lead times accordingly.

Please get in touch with a member of the team using the contact details below:

Email - ist@ist.org.uk

Office telephone - +44 (0) 114 276 0771

FATIGUE TESTING

Fatigue testing springs is the only sure way to validate their expected life. It can take as little as 3 days to test a spring to ten million cycles, usually regarded as the point at which the spring can be said to have infinite life.

- Up to 40 kN load with stroke up to 250 mm
- Cycle rates of 50 Hz / 3000 rpm (speed will vary depending on spring design)
- Testing at up to 180° C or sub-zero temperatures
- Load testing before and after
- Torsion fatigue testing, including spiral and clock spring types.

RELAXATION TESTING

Relaxation testing allows us to predict how a spring will perform over a long period of time in service. We have the facilities to carry out both dynamic and static relaxation testing.

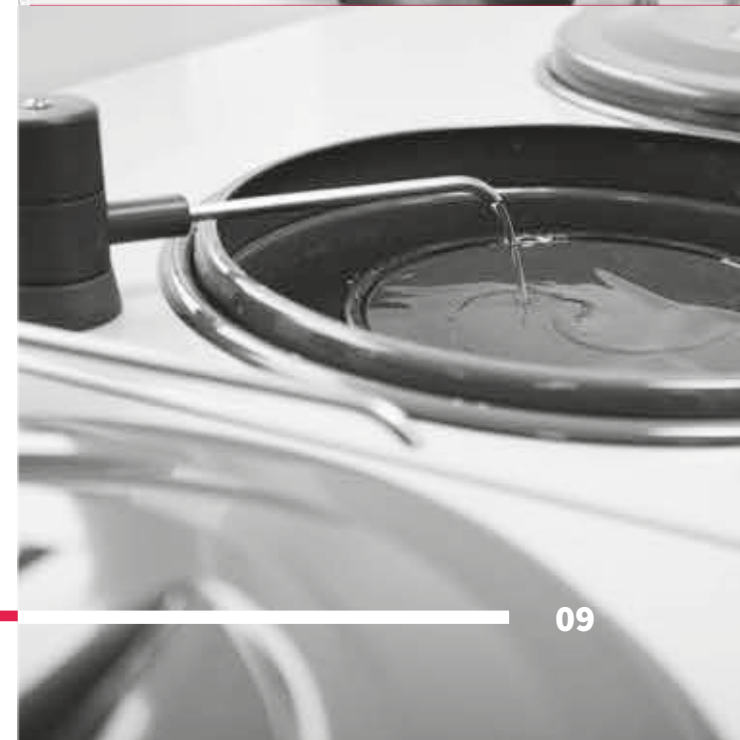
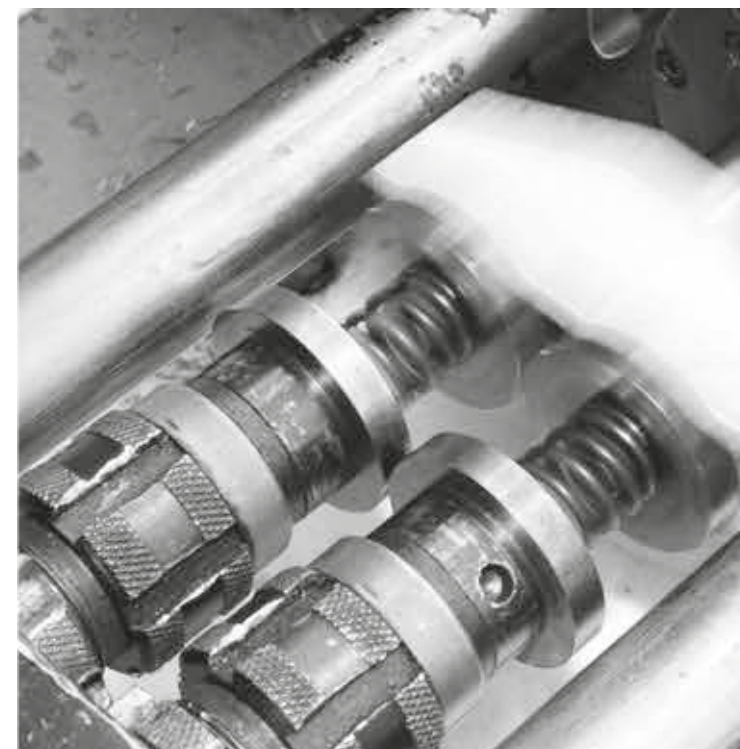
LOAD & TORQUE TESTING

Our calibrated load testing range is 0.4 N to 100 kN for both compression and extension. We also offer non-axial load testing.

We can torque test from 0.005 Nm to 100 Nm, including manufacture of custom fixtures where necessary.

MATERIALS TESTING

Our routine material testing services include: tensile testing of wire, torsion testing of wire, optical metallography for micro structure, surface quality and hardness. We also offer bend, twist and wrap tests and coating thickness determination.



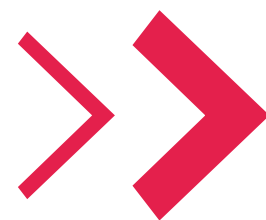
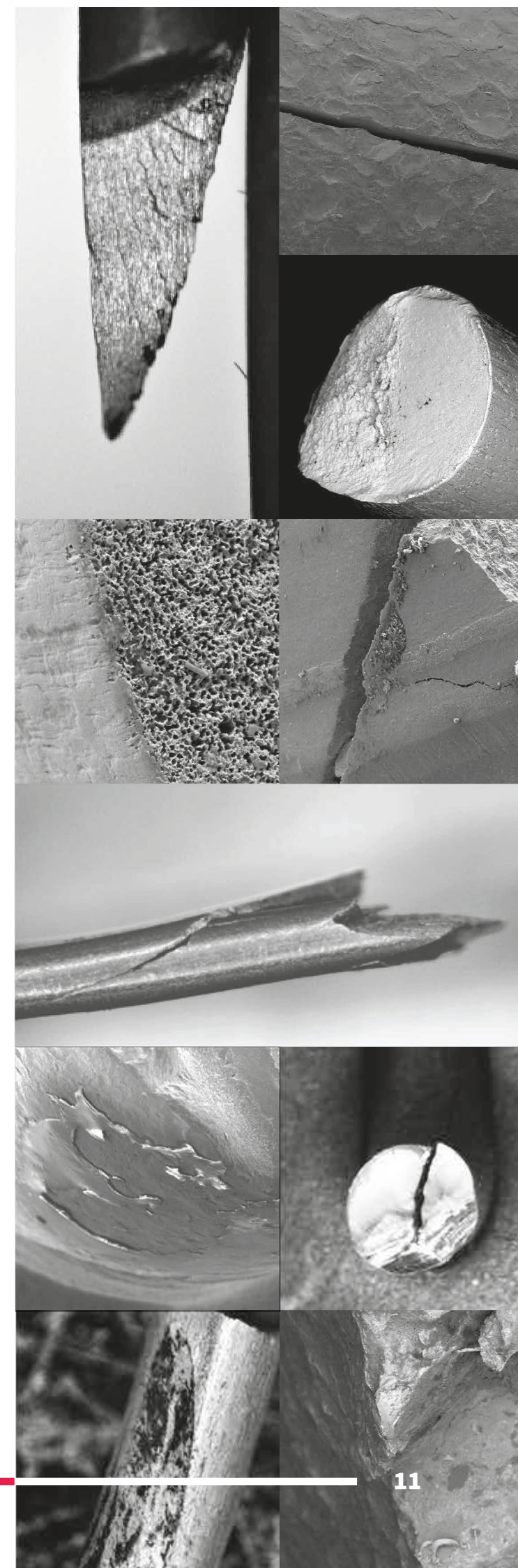
Failure Analysis

Springs are often critical components in a huge number of products across many sectors including medical, transportation, oil and gas. As such, failure in service is at best considered unacceptable and at worst catastrophic. We believe it is not only important to understand how a spring failed but why, minimising the risk of future failures.

Recently we've performed failure analysis on: wave springs used in oil and gas valves, nested springs in train bogies, commercial vehicle leaf springs, engine valve springs, medical auto-injector springs and Tuk Tuk suspension springs. This is made possible because of our broad, in-depth knowledge of springs and robust failure analysis procedure.

Our failure analysis procedure includes visual, microstructural, and SEM imaging and examination as well as hardness tests and EDX analysis, providing us with all the relevant data to come to an informed conclusion. Although there are other facilities that can determine the failure mechanism of springs, we can call on our decades of experience and in-house experts to determine not only the root-cause of failure but also recommend how to eliminate the risk of future failures. All of this information is included in our reports as standard.

Until a spring has failed, the true impact is never fully understood in how vital a role these components play. Therefore, spring failure not only needs to be understood by determining the mechanism and the root cause of that failure, but recommendations need to be made to reduce the risk of failure occurring again. We offer a fast, accurate and confidential diagnosis and prevention service - undertaking detailed failure analysis to determine the underlying cause of a product's failure and provide recommendations to prevent recurrences.



Shot Peening

Our shot peening service is specifically tailored to enhancing the fatigue performance of springs. Our service includes steel and glass media, spring wire / section sizes from 0.25mm (0.01") upwards plus full technical back-up all rigorously quality controlled to ISO 9001.

Shot peening benefits include improved life of the component and compressive stresses as well as the removal of burrs, metal flashing and scale. It also reduces the risk of surface cracks.

Other peening and post-peening services include low temperature heat treatment, temporary corrosion protection, pre-stressing to stabilise dimensions, acid dip and passivation for stainless steel springs, fatigue testing to validate the efficiency of the shot peening process and duplex and strain peening.

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Research

Research has always been at the heart of what we do. All the data we gather from working with springs on a daily basis goes back into our software, training, testing and consultancy work. The symbiotic relationship between all our services enables us to develop software that is smarter, deliver better training and advise businesses on best practices with the most relevant and accurate information. Through our dedication to research in the field of spring technology we can help you to design springs which are safe, efficient and reliable.

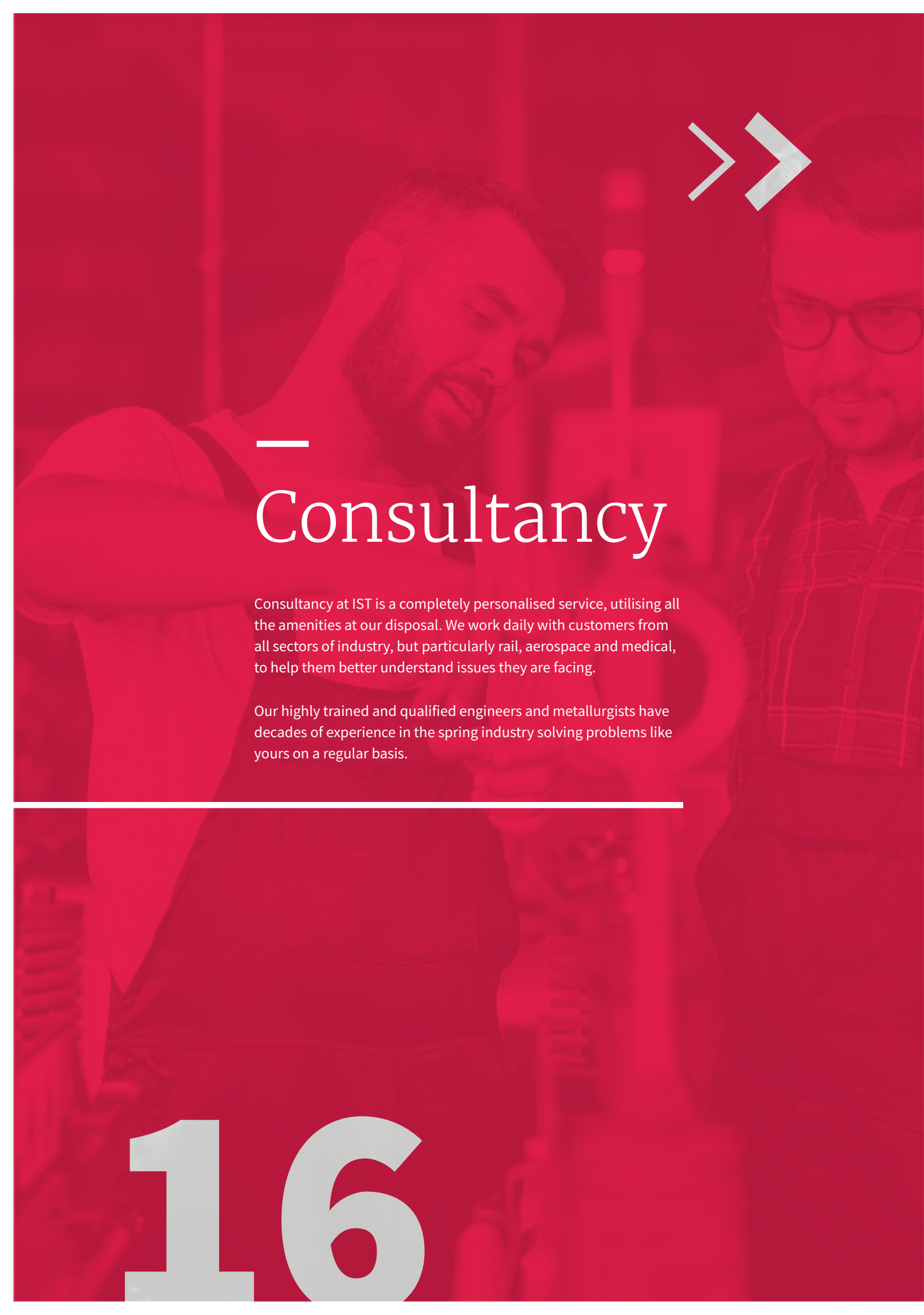
In 2020 and onwards we have been focusing on two key research projects, the first is investigating the benefits of nitriding. The aim of this research is to include the data in our software so users can confidently predict the life of nitrided springs.

The second project will involve the help of spring manufactures, suppliers and end users across the globe gathering and examining fatigue data. As modern manufacturing techniques have advanced so has wire quality - we feel now is the right time to compare our data against the state of the industry.

As an impartial association and crucial voice to the spring industry it is our responsibility to ensure that our data stays good for the foreseeable future so our customers continue to get the reliable results they are used to.

Research reports will be made exclusively available to our membership from both projects, and everyone who uses our products and services will benefit from the data discovered.

Helping you to design safe, efficient and reliable springs



Consultancy

Consultancy at IST is a completely personalised service, utilising all the amenities at our disposal. We work daily with customers from all sectors of industry, but particularly rail, aerospace and medical, to help them better understand issues they are facing.

Our highly trained and qualified engineers and metallurgists have decades of experience in the spring industry solving problems like yours on a regular basis.

Although consultancy is a very wide-ranging service that we offer, spring design and validation is one of the most common consultancy topics we deal with. Typically, this starts with a spring not performing as the designer intended. In cases such as these consultancies could involve; testing to understand the problem better, releasing technical information so the customer can understand why the issues are occurring and suggesting changes to the design or tolerancing parameters so the spring will operate as expected. Liaising with relevant parties, like end users, spring manufacturers and wire manufacturers, throughout the supply chain helps everyone understand the issue and why our suggestions are important. We also regularly deliver customised training programs, on-site, to businesses. This helps employees experiencing similar issues with spring design to reduce the chances of future occurrences of the problem.

The consultancy work performed at IST is incredibly varied and can range from simply providing technical information through to detailed reports outlining spring design, test results, operation and failure. The one constant factor is that our customer has a problem, and we aim to solve it.

Offering unparalleled services to the global spring industry



Global Membership

Why Become a Member?

Whether you need independent advice with a spring design or material choice, want to take advantage of our great discounts, access reports, publications and articles, need impartial services to support your customers or all of these things! We are here to help your business make safe and reliable springs.

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MEMBERS WORLDWIDE

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COUNTRIES

- Access to over 350 research reports covering: spring technology, spring materials, spring design, spring manufacture and testing
- Discounted rates for our software, routine spring / non-spring testing services, technical consultancy, shot peening and specialist training courses
- Access to our global database covering published technical, trade and specification literature
- Technical help via email and telephone accessing specialist expertise from our in-house metallurgist
- Company representation and support for ISO/CEN/BSI standards meetings/audits or work groups
- Access to members only website
- Online entry to our membership directory
- Invitation to bi-annual IST technical meetings
- Attendance at social events

Apply for membership of The Institute of Spring Technology at ist.org.uk/membership/



Institute of
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Member

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We are the leading
authority on
springs and spring
technology.

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