



Using advanced polymer technology, Trelleborg's Antivibration Solutions (AVS) operation specializes in the field of rubber-to-metal bonding for the removal of unwanted noise and vibration. Part of the Industrial Solutions division of Trelleborg Group, we harness over 100 years of experience to solve a wide range of application and environmental challenges in sectors including rail, marine, industrial and off highway. Focused on isolation, attenuation and suspension solutions of unrivalled quality and reliability, we have a reputation for high quality, outstanding performance and long service life. Our commitment and expert polymer technologies optimize comfort, health and safety while creating maximum business value through improved longevity, productivity and cost effectiveness.

WWW.TRELLEBORG.COM/ANTI-VIBRATION-SOLUTIONS

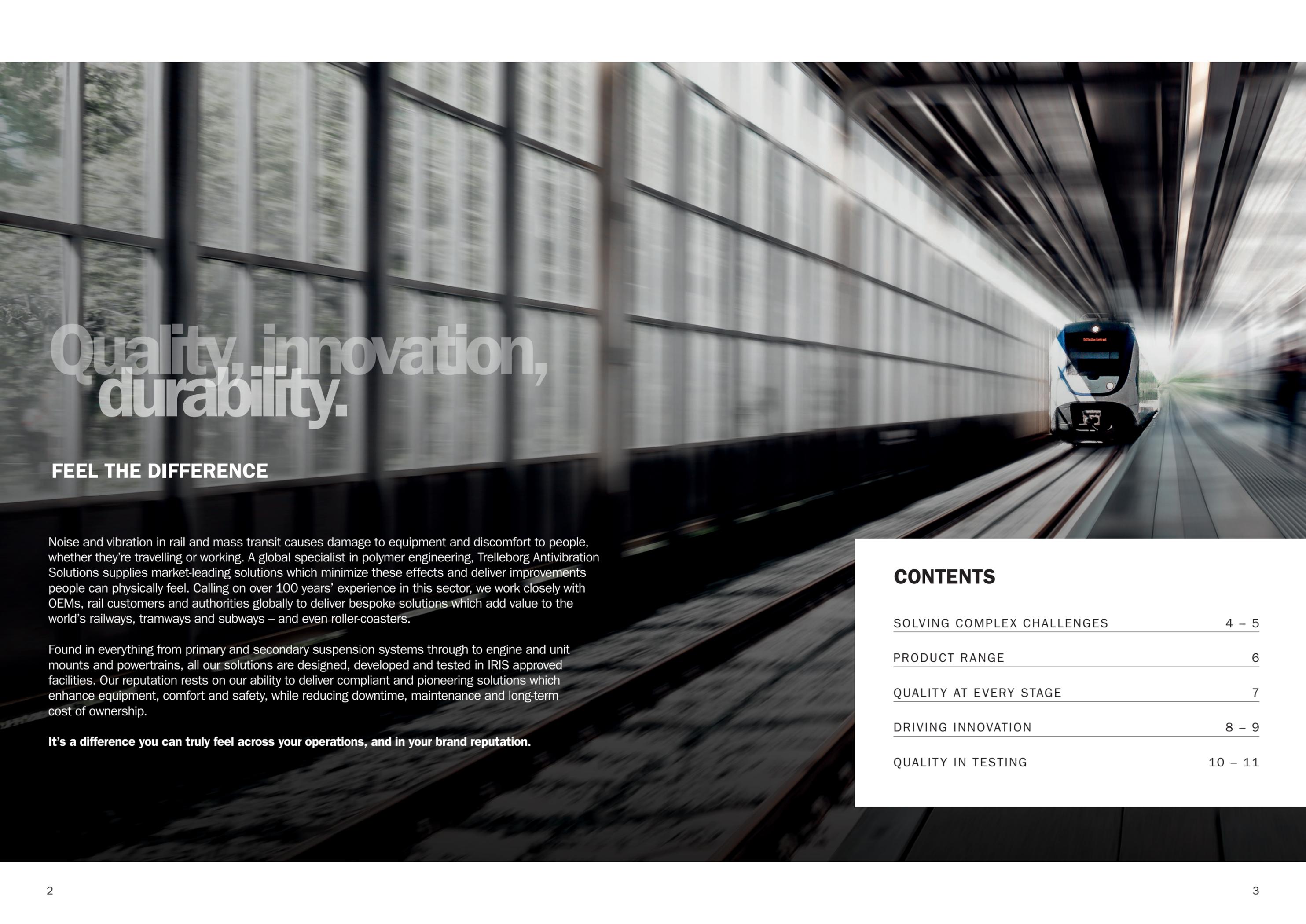
ANTIVIBRATION@TRELLEBORG.COM



Global, compliant, comfortable, complete.

BEING ON TRACK NEVER FELT BETTER





Quality, innovation,
durability.

FEEL THE DIFFERENCE

Noise and vibration in rail and mass transit causes damage to equipment and discomfort to people, whether they're travelling or working. A global specialist in polymer engineering, Trelleborg Antivibration Solutions supplies market-leading solutions which minimize these effects and deliver improvements people can physically feel. Calling on over 100 years' experience in this sector, we work closely with OEMs, rail customers and authorities globally to deliver bespoke solutions which add value to the world's railways, tramways and subways – and even roller-coasters.

Found in everything from primary and secondary suspension systems through to engine and unit mounts and powertrains, all our solutions are designed, developed and tested in IRIS approved facilities. Our reputation rests on our ability to deliver compliant and pioneering solutions which enhance equipment, comfort and safety, while reducing downtime, maintenance and long-term cost of ownership.

It's a difference you can truly feel across your operations, and in your brand reputation.

CONTENTS

| | |
|-----------------------------------|---------|
| <u>SOLVING COMPLEX CHALLENGES</u> | 4 – 5 |
| <u>PRODUCT RANGE</u> | 6 |
| <u>QUALITY AT EVERY STAGE</u> | 7 |
| <u>DRIVING INNOVATION</u> | 8 – 9 |
| <u>QUALITY IN TESTING</u> | 10 – 11 |

Global, local, expert.

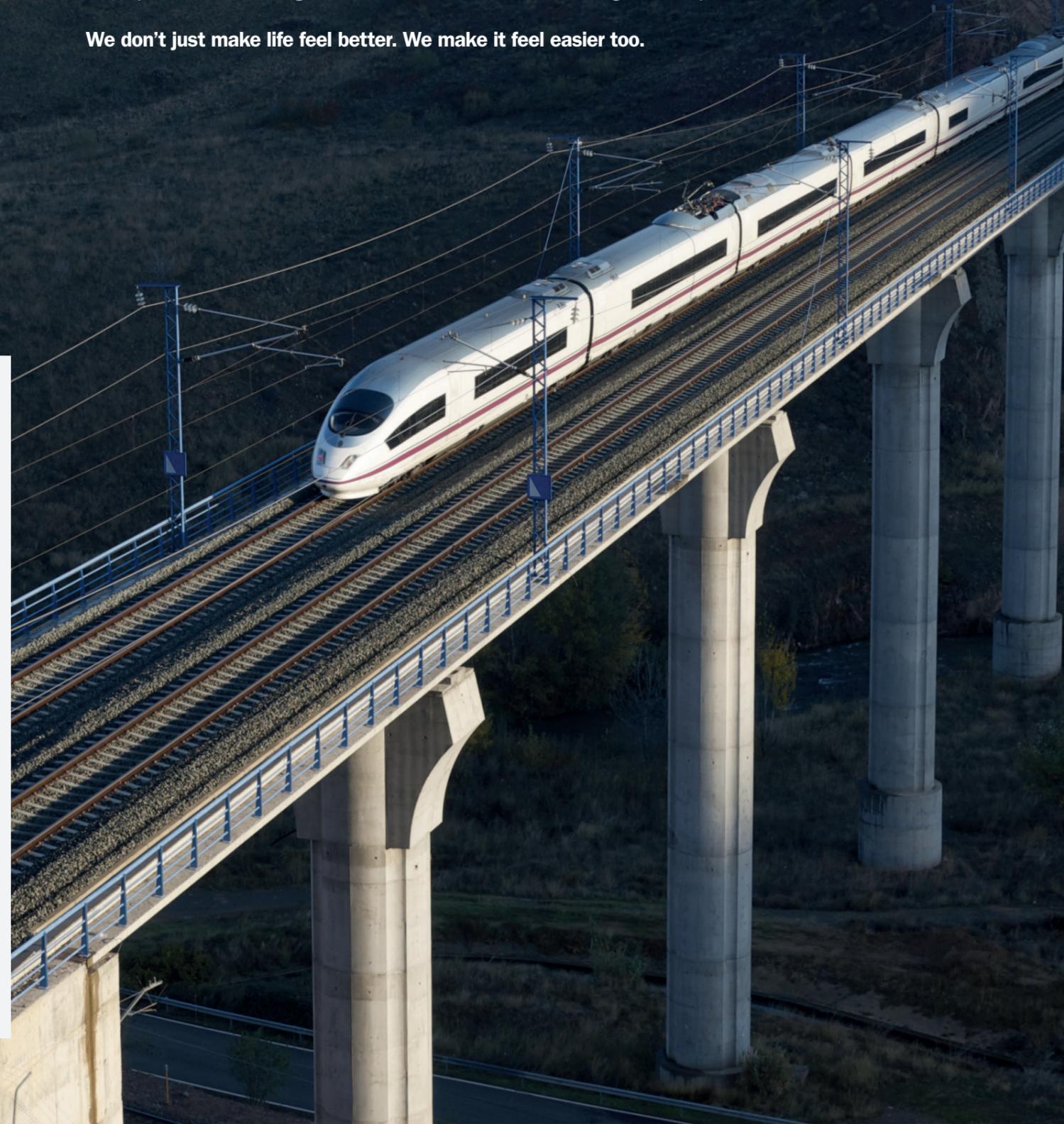
FEEL THE BENEFIT OF PARTNERSHIP

Playing a vital role in national and global economies, the rail industry is responsible for transporting people and goods safely, reliably and cost-effectively. We work tirelessly to meet these demands, developing safe solutions that perform over long and arduous lifecycles in the most challenging conditions. Thanks to our efforts, passengers and workers feel safer and more comfortable, and our customers feel the benefits of working for a pioneering global brand:

- **Protection.** Our solutions extend the life of your equipment and components and offer superior protection against impact, vibration and noise.
- **Value.** By helping reduce downtime, we minimize your maintenance and repair costs while lowering the long-term cost of ownership.
- **Responsibility.** We help you improve the safety and comfort of passengers, as well as the sustainability of your equipment.
- **Support.** Wherever you are, you'll have access to local engineering support and a robust and reliable supply chain.
- **Peace of mind.** Fully tested and compliant with all international standards, our market-leading solutions meet the high levels of safety and reassurance that the rail industry demands.

Committed to partnership working, we'll support you at every stage, from design and testing through to installation and training, helping you optimize your operations. And in terms of choice, quality and logistics, we offer a complete service which helps you cut costs, mitigate risk and receive on time, on budget delivery.

We don't just make life feel better. We make it feel easier too.



Quality at every stage

An acknowledged world leader in the design and manufacture of rubber-to-metal bonded components, Trelleborg Antivibration Solutions has developed a comprehensive portfolio of rail application solutions.



Airsprings

Low vertical natural frequency
High horizontal deflections and low stiffness
Constant height control



Hydraulic axle guide bearings HALL®

Frequency depending stiffness
Reduces wear and abrasion
Reduces energy consumption



Chevron product range

Linear vertical stiffness
Variable lateral and longitudinal stiffness
Stiffness rates can be varied by changing installation angles



Hourglass springs product range

Rising vertical stiffness with load
providing constant natural frequency
Suitable for a range of applications
Wide variety of sizes



Primary conical spring product range

Compact design containing horizontal loads within the product
Low horizontal stiffness and high displacement capacity
Simple to install and low maintenance



Suspension components

Wide range of products
Bearers, bushes, links, coil spring pads
Customizable to your needs



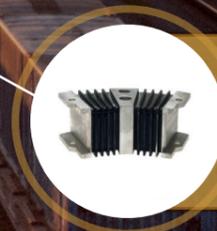
Vee mount product range

Ideal for rail vehicle engine suspension
Strong casting for safety and reliability
Three dissimilar translational stiffness
for the best vibration isolation



Metacone product range

Large static deflections
Compact fail safe design



Powertrain components wedged mounts, spherical bearings and bushes

Transmission of high forces
Wide range of variations
Low maintenance



Customized, compliant, complete.

DRIVING INNOVATION INTO THE RAIL INDUSTRY

Trelleborg Antivibration Solutions has developed many ‘first to market’ solutions for the rail sector, including the chevron, hourglass spring and airspring. Once setting a new benchmark, these have since become industry standards.

Similarly, Trelleborg Antivibration Solutions manufactures and markets the Metalastik® brand. First introduced almost 100 years ago Metalastik® has evolved to become one of the most respected and successful brands in the rail industry.

This innovation continues today. Investing significantly in R&D, we work closely with rail customers and academia to develop new solutions which anticipate and meet future needs. As a result, we offer one of the most complete portfolios of rail sector solutions – and one we’re adding to continuously.

We can apply this innovation to your unique needs, developing a bespoke and cost-effective solution for your application. Give us the challenge, and our specialist teams will work with you at every stage – from concept, design and manufacturing, to modelling, testing and installation.

With our expertise and experience, and our IRIS approved facilities, the solution will meet your needs and be fully compliant with international standards, ensuring you feel the full power of our innovation.

Tested, trusted, proven.

QUALITY IN TESTING, MANUFACTURE AND SUPPORT

We understand the demanding environment of the rail industry, and the pressures you face.

On one hand there's the over-riding concern for safety, with comfort for workers and passengers also a prime consideration. On the other, there's the need to drive energy efficiencies in the face of rising environmental concerns. And through it all, there's the need to improve productivity and profit by extending the life and performance of equipment.

For these reasons, the rail industry is both risk averse, and keen to embrace new cost-effective technology. Trelleborg Antivibration Solutions is able to balance the demands of both.

Our high-quality products are the result of over 100 years' experience in the rail sector. They're manufactured in a world-class plant with superior materials and technology, giving you proven performance and total peace of mind. And they're tested in IRIS approved facilities, delivering the reassurance and quality you need throughout the lifecycle of your product.

What's more, as part of a major international group, Trelleborg Antivibration Solutions offers you the reassurance of financial strength, global support and on-going investment in quality and testing.

You will feel the advantages today, and into the future.

