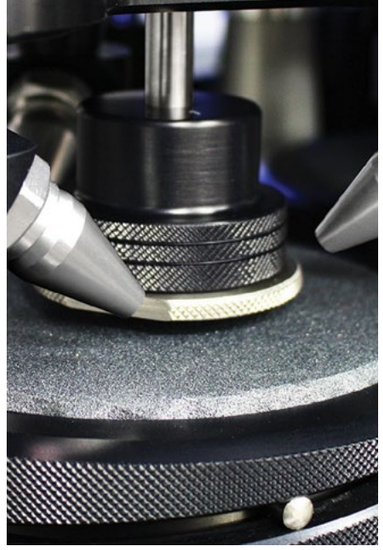
James Heal™
Extraordinary Testing Solutions

ElastAbrasion

The future of Elastomer Abrasion Testing



ABOUT US

EVOLUTION OF A NEW INSTRUMENT

KEY FEATURES & BENEFITS

SERVICE, SUPPORT &TECHNICAL INFORMATION

James Heal
Extraordinary Testing Solutions

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ABOUT US

COMPANY

Established in 1872, James Heal is an international engineering company renowned worldwide for delivering premium quality, reliable and innovative materials testing solutions. From its core manufacturing and commercial headquarters in the United Kingdom, the company specialises in the design and production of Testing Instruments and Test Materials (consumables) supported by industry-leading service and support.

At the core of our company is the seamless interaction between high quality, precision, reproducibility and reliability combined with innovation, imagination and industry-leading technical expertise. This combination has resulted in James Heal becoming one of the most trusted and valued materials testing companies in the world.

MARKETS & APPLICATIONS

Over the decades James Heal has established itself as the leading supplier of premium textile testing solutions. Working closely with customers and industry experts to understand requirements and industry trends, James Heal designs its Testing Instruments with the users in mind, offering the most user-intuitive and innovative solutions in textile testing.

In parallel, this knowledge and expertise has in recent times evolved into non-textile applications, with the company working closely with some of the biggest names in the Rubber, Paper, Wood, Plastics and Glass industries to develop first-rate materials testing solutions.

Taking testing to new levels

INNOVATION

Our passion for testing is sparked by imagination and fuelled by expertise.

Indeed this passion for new ideas characterises the way we work with each other, with our customers and with our partners.

To provide the most innovative solutions that solve even the most complex and challenging material testing problems, we put the user at the forefront of our test instrument design process, combining intelligent and intuitive user interfaces with the best in instrument aesthetics, functionality and reliability.

QUALITY

Quality is an integral part of the James Heal DNA.

Our vertically integrated production facilities in Halifax, in the north of England, enable us to have complete control over production parameters and quality to provide customers with the reassurances they are looking for from a premium supplier.

Furthermore, James Heal offers Service & Support services delivered by some of the most experienced and well-trained engineers in the industry, supporting our customers worldwide and optimising instrument life cycles for maximum return on investment.

CLOSE TO CUSTOMERS

The James Heal network spans the globe, ensuring that customers benefit from the flexibility and reliability of having both technical and commercial contacts readily accessible in their local markets, as well as directly from James Heal in the UK.

Our local specialists speak the language of our customers and business partners and understand the service and on-site requirements of their markets.

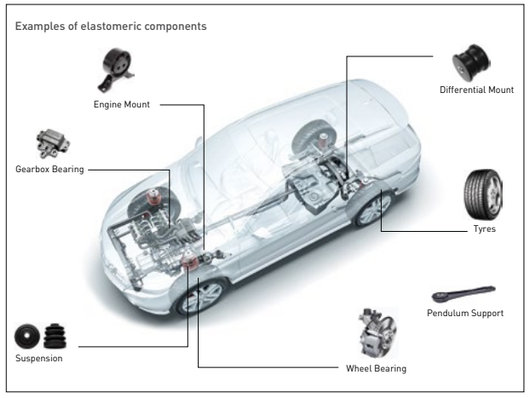
They are also deeply ingrained in the James Heal culture, drawing on our world-leading expertise in technology, innovation and quality to support customers in the more than 70 countries in which we operate.

KEY ROLE OF ELASTOMERIC COMPONENTS

The use of elastomeric components in the automotive and aerospace industries has increased dramatically over the past twenty years.

Once regarded as having a limited lifespan and needing to be replaced frequently, elastomeric components are now expected to survive even the most demanding of thermal, chemical and mechanical stress conditions.

Indeed the service life expectations of, for example, gaskets, seals and o-rings and noise reduction and dampening components, are frequently targeted towards the entire lifespan of a vehicle.



With elastomeric components becoming increasingly important for critical service applications, material testing and analysis of elastomers is often a major consideration within the automotive and aerospace industries.

Analysing the effect of abrasion on elastomers using traditional testing methods has typically resulted in unreliable and inconsistent data generated using testing instrumentation that is highly manual, expensive to run and not user friendly.

ABRASION TESTING EXPERTISE

Working in collaboration with Dr. Martindale, who pioneered the development of the original Martindale Abrasion Tester for textile testing back in 1942, James Heal began designing, manufacturing and marketing premium quality Testing Instruments for wear and abrasion testing in the 1950s.

Since then, the company has emerged as the leading manufacturer of premium Martindale Wear and Abrasion testing instruments used in the Textiles industry, with thousands of units sold into more than 70 countries.

James Heal has collaborated with some of the leading companies in their field to develop first-class abrasion and wear testing solutions which have been successfully adopted for use across a broad and diverse array of non-textile testing applications.

Evolution of a New Instrument

Tested and approved by
Volkswagen
Compliant with VW Standard PV3984

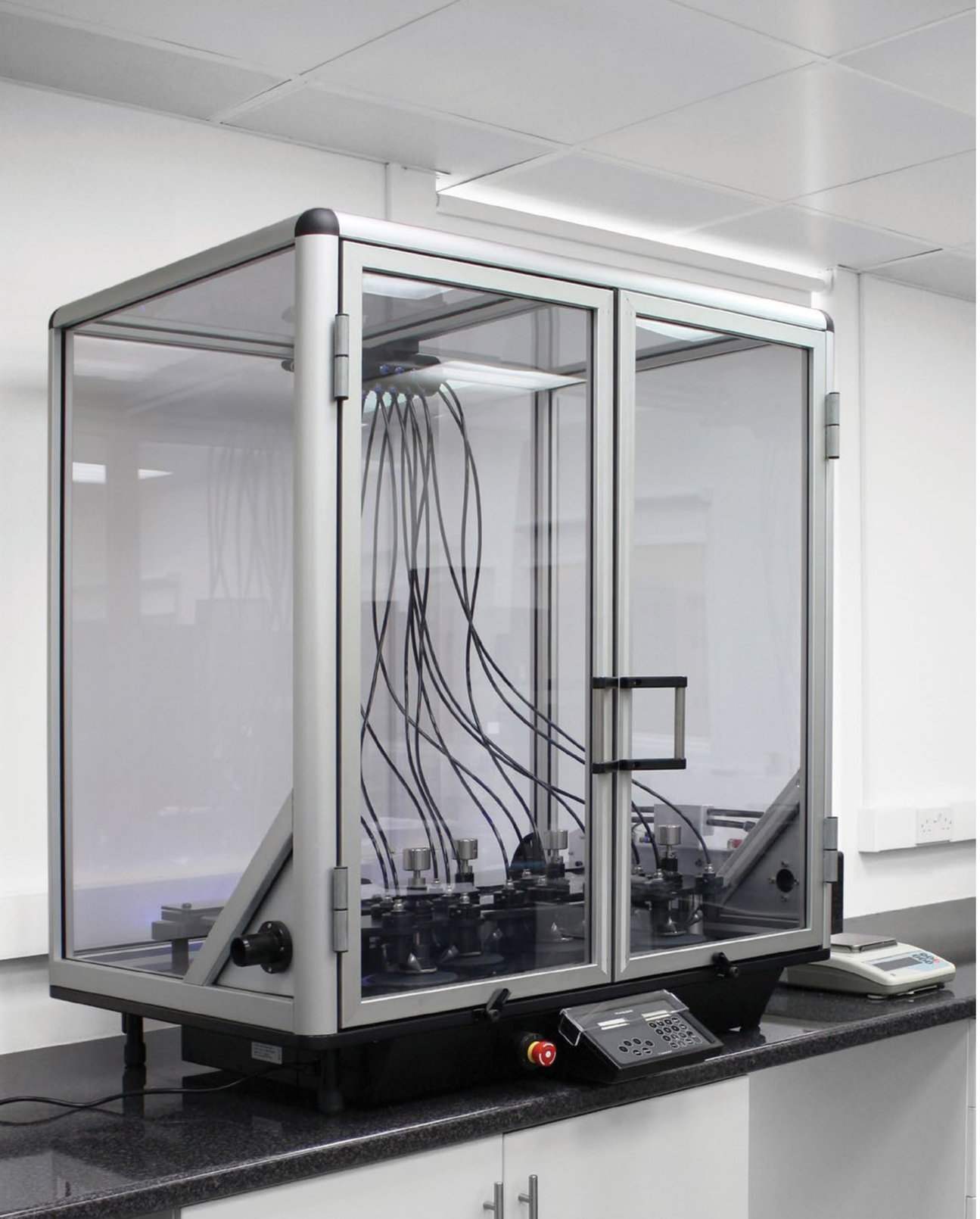
THE ELASTABRASION DEVELOPMENT JOURNEY

One example of working closely with our customers to develop new and innovative solutions to solve even the most challenging of problems involved the German car manufacturer Volkswagen.

Having successfully worked for many years with a James Heal Martindale for automotive textile testing, Volkswagen charged James Heal engineers and designers with the task of developing a customised version of the Martindale instrument to meet the demanding requirements of their elastomer testing laboratory. The result is ElastAbrasion – the future of elastomer abrasion testing.

Fully tested and approved by Volkswagen, and compliant with the VW Standard PV3984, ElastAbrasion was designed to not only provide a more reliable and consistent testing instrument than those currently available on the market but also offer a more user-friendly and cost-effective solution.

James Heal has since partnered with some of the leading automotive manufacturers, tyre manufacturers and Tier One elastomeric component manufacturers to validate and promote ElastAbrasion as a key instrument in the advancement of high quality elastomer abrasion testing.



The future of Elastomer Abrasion Testing

ABOUT ELASTABRASION

ElastAbrasion is an exceptionally designed, precision engineered instrument to determine the resistance to frictional loss of elastomer products.

It offers significant levels of authenticity, accuracy, productivity and cost effectiveness combined with incomparable safety and ease of use.

Authentic and Representative
Using our design expertise and understanding of abrasion testing we developed a solution that more accurately reflects the true multi-directional motion of a vehicle.

Increased Productivity
Four test stations enable users to test samples simultaneously to increased productivity, and the expertly designed hinged top-plate also facilitates easy access to the test stations for easy set-up and test management.

Cost Effective
ElastAbrasion has been designed to significantly reduce cost per test in comparison with currently industry standard practices. This includes reduced labour and consumable cost.

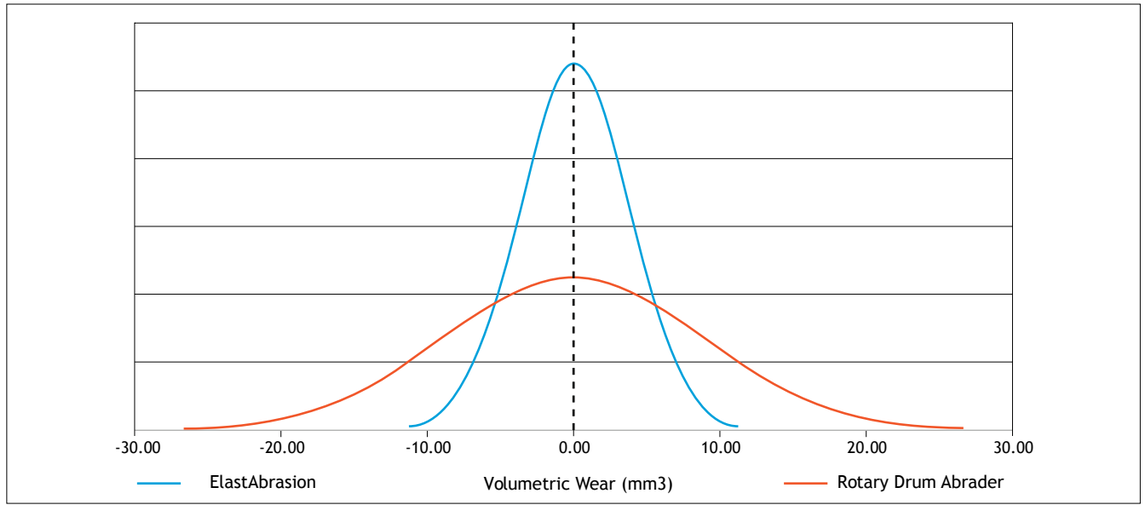
Safe and Clean
A clean working environment and operator safety was a key design element of this instrument. Consequently we believe ElastAbrasion to be safest instrument available in the world used for this end-use.

The instrument conforms to Volkswagon test standard PV 3984 Elastomer and Thermoplastic Elastomer – Determination of Abrasion.

HIGH INSTRUMENT TEST ACCURACY

The high instrument test accuracy of ElastAbrasion equates to reliable and reproducible performance data.

Comparison of Rotary Drum vs ElastAbrasion using standard BAM rubber



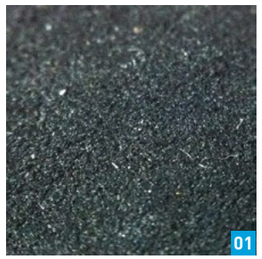
Comparative Testing

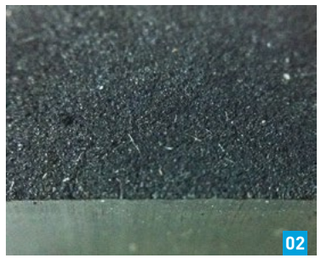
During comparative testing two sets specimens were taken of which 50% were tested using ISO4649 and 50% were tested on ElastAbrasion using PV3968. The specimens were weighed and the volumetric wear was calculated.

The results indicate when using the BAM reference rubber, ElastAbrasion provides the same average result but with a greater than 50% reduction in the range distribution compared with the ISO results.

This is attributed to several factors within the design and functionality of ElastAbrasion; the specimen remains in contact with the abrasive paper throughout the test as the elastomeric debris is continually removed, the fine grain of the abrasive paper creates a consistent surface and the alignment and movement of the specimen creates a favourable multi-directional specimen geometry.

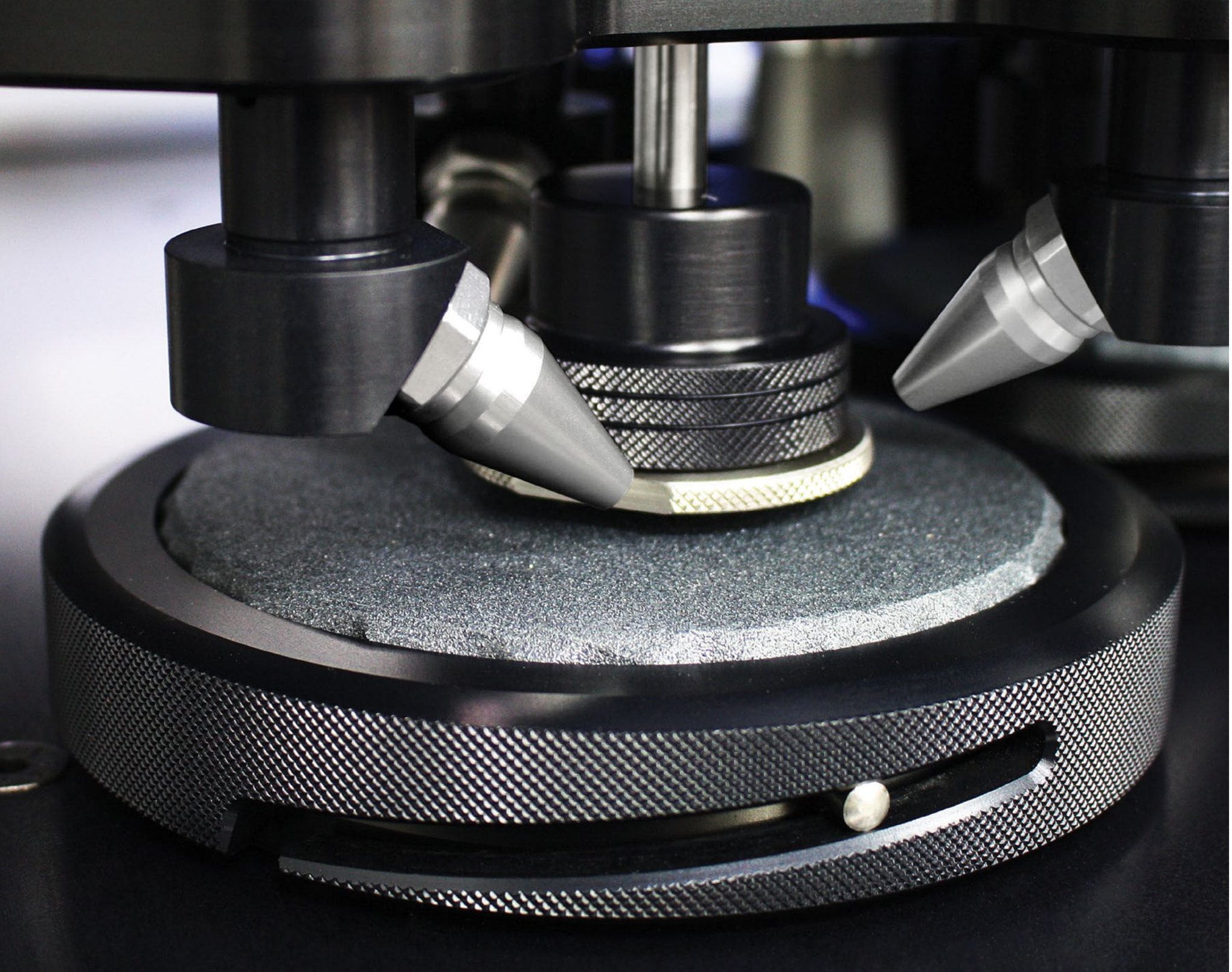
Consequently accurate and repeatable results enable more quantifiable QC analysis to facilitate better informed decisions, especially critical for marginal products and for R&D projects.





Even and Consistent Surface Wear

The surface of the specimen when tested on ElastAbrasion shows smooth and consistent wear (01) with a clean edge (02).



COMPRESSED AIR REMOVES DEBRIS

Eliminate the risk of compromised test results.

Each of the four stations of ElastAbrasion incorporates three equidistant pneumatic nozzles which supply a constant 1 bar of compressed air pressure to blast away the specimen debris from the abrasive paper.

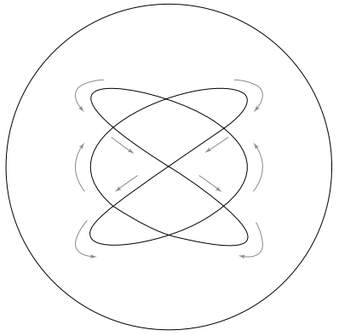
Removing the debris ensures the sample remains in contact with the abrasive paper throughout the test, eliminating any potential compromise of the test results.

Additionally, as this process is automatic, it removes any necessity for an operator to manually brush away debris during the test cycle. This enables work to be carried out elsewhere until the test is complete and eliminates any risk to the safety of the operator.

The pneumatic air supply is automatically turned off at the end of the test to save energy.

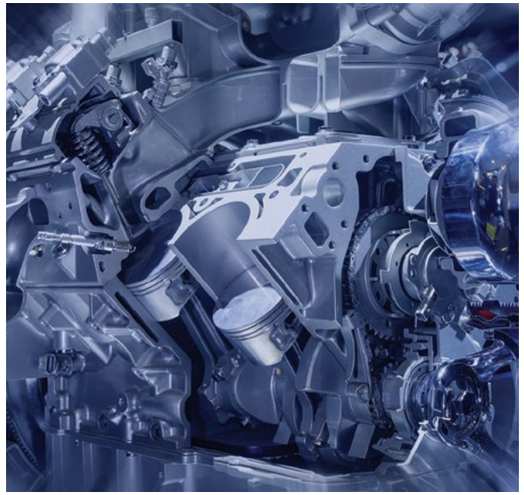
AUTHENTIC AND REPRESENTATIVE

During the development of ElastAbrasion we developed a unique multi-directional lissajous pattern which provides high and low velocities.



This pattern helps ensure that the geometry of the test specimen more accurately simulates real life conditions of elastomeric components when in situ within a vehicle than typical single-directional testing instrument used in the industry.

The multi-directional geometry also ensures a consistent level of abrasion across the entire surface without edge variation.



4 STATIONS OFFERS INCREASED PRODUCTIVITY


01

Improved Productivity

ElastAbrasion is equipped with four stations to enable four samples to be tested simultaneously.

This, together with the reduction in set-up times, ensures a substantial increase in productivity over other instruments currently used for elastomer abrasion testing.

Easy Access

ElastAbrasion has a hinged top plate [02] which allows easy access to all testing stations.

Full access to the instrument enables efficient and rapid set-up and completion of the testing process. [01]


02

FLEXIBILITY

James Heal instruments are renowned for user-focused design. In particular the user interface, which is located outside the cabinet, is designed to be user-friendly and intuitive.

ElastAbrasion offers the flexibility to change the variables as highlighted below;

Speed
Adjustable to enable testing in correlation to real life changes in speed.

Number of Rubs
The number of rubs within the test is adjustable to reflect the differing workload of the relevant vehicle components.

Load
Variable load to reflect the real situation loads upon the specimen.

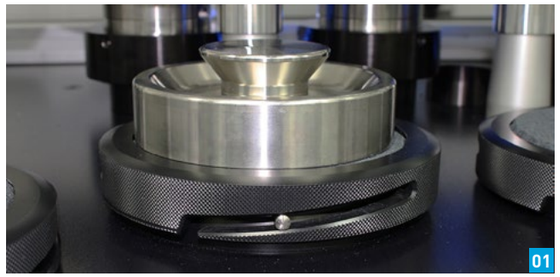
Abrasive Paper
Different grades of abrasive paper can be used to simulate alternative wearing characteristics.

EASY SET UP

Setting up the James Heal ElastAbrasion is very simple and efficient. As a BAM reference rubber is not required to verify the abradant the comparative costs of the testing process are reduced.

Abrasive Paper

We supply a quality assured abrasive paper, accompanied by a Certificate of Conformity, to guarantee grain consistency throughout the batch. The fine grit grain used provides a homogeneous surface to the abraded specimen, giving consistent results. This eliminates the need for specialized sandpaper offering companies a significant reduction in consumables cost.



Quick-Lock Clamp Ring

The set-up process is very simple. A pressing weight holds the abrasive paper in place which is then locked by lining up the 3 locking pins of the clamp ring and secured with a twist. [01]

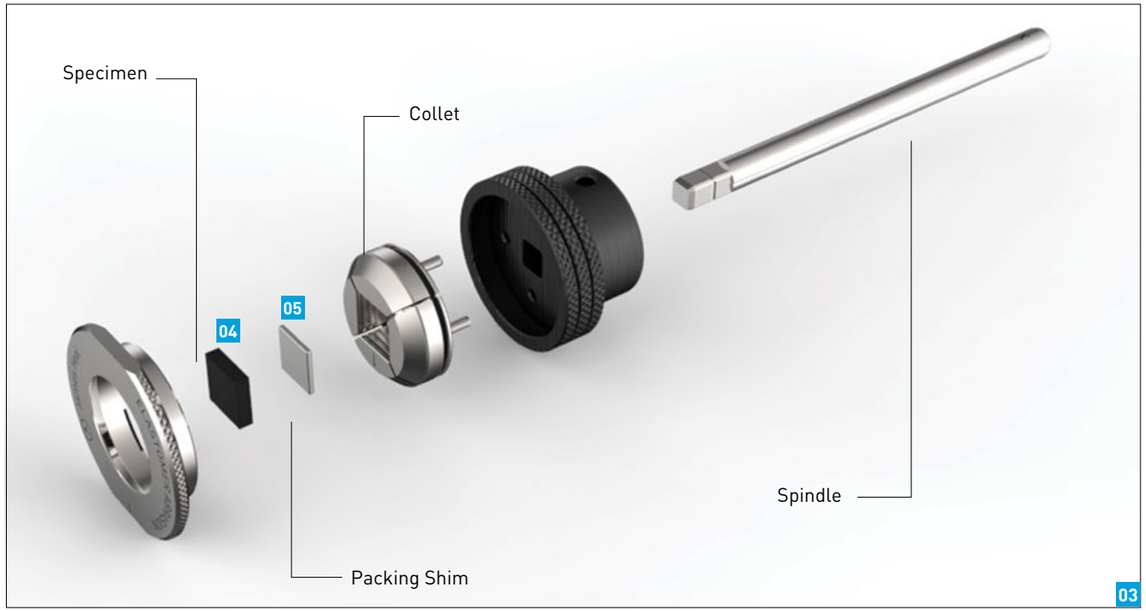
Weight

Pressure on the sample is applied constantly and evenly and is set using the weight and collar at the top of the spindle. [02]

The weight can be adjusted for non-routine testing using a 1mm setting gauge.

SPECIMEN HOLDER

The specimen holder [03] for ElastAbrasion is specifically designed to hold an elastomeric specimen [04] **15±0.2mm x 15±0.2mm** with a maximum thickness of 12mm. The packing shims [05] are used to create a protrusion of 2±0.2mm.



Flexibility – Accuracy – Ease of use

These holders have a 'Quick-grip' function to accommodate specimens of different thicknesses and are designed with a 4 jaw arrangement to clamp the sample firmly in place [06]. The design also ensures the sample is consistently inserted at the same angle, to ensure repeatable and reliable results.

Four shim kits are supplied with ElastAbrasion; each with 14 shims of varying thicknesses. The shims [05] allow the specimen to be packed into the holder with accuracy giving a 2±0.2mm protrusion.

The collet (the holding device) is held in a fixed position within the holder to avoid movement.

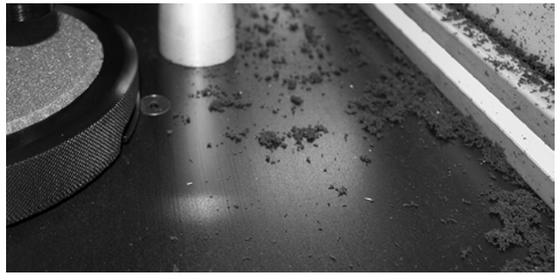
Test specimens can be **15±0.2mm x 15±0.2mm** with a maximum thickness of **12mm.**

SAFE WORKING AND A CLEAN ENVIRONMENT

The James Heal ElastAbrasion has been designed with operator safety and a clean working environment as a key element of the instrument.

Enclosed Cabinet

All moving parts of ElastAbrasion are housed within an enclosed cabinet. Testing can only take place when these doors are closed, and will immediately stop if opened during testing. This offers a significant improvement in user safety as it eliminates the potential for injury.



Clean Atmosphere

The enclosed cabinet also contains the potentially harmful elastomeric debris and prevents it from being released into the surrounding atmosphere, helping to ensure a clean and healthy working environment.

Two Vacuum Points

A vacuum hose can be attached to either side of the cabinet to extract any fine airborne debris. The vacuum can be powered through the instrument by fitting an IEC connector to the vacuum wiring and plugging into the instrument; it can then start and stop automatically with each test.

SERVICE & SUPPORT

We recommend a yearly service and calibration for ElastAbrasion to ensure optimum performance and safety.

During regular service visits, James Heal engineers (or selected accredited local engineers), will undertake precision measurements, calibrating the instrument to ensure compliance to standards is achieved and maintained.

Our engineer will calibrate the lissajous motion, measure the speed of rotation of the drive mechanism and the mass of the sample holder.

The engineer will also check each clamping rings on the four stations to ensure the abrasive material remains firmly in place and stays within the specification and will assess the air supply pressure to confirm debris continues to be removed from the rubbing surfaces.

Ensure optimum performance and safety

TECHNICAL DATA

Dimensions	Height	Width	Depth	Weight
	1191	1246.5*	845	160

* The dimensions above are with the doors closed and the pneumatics kit folded in to the side of the instrument. Please refer to the diagrams on the right for the total space requirement.

Installation Requirements	
Power:	85-264 VAC; 2 A; 50/60 Hz; 60W Mains electricity must be free from spikes and surges exceeding 10% of nominal voltage.
Air:	ElastAbrasion requires compressed air from factory air line with a pressure of 1 ±0.1 bar. Once connected, the air supply automatically synchronizes with the operation of the instrument and consequently consumes compressed air economically.

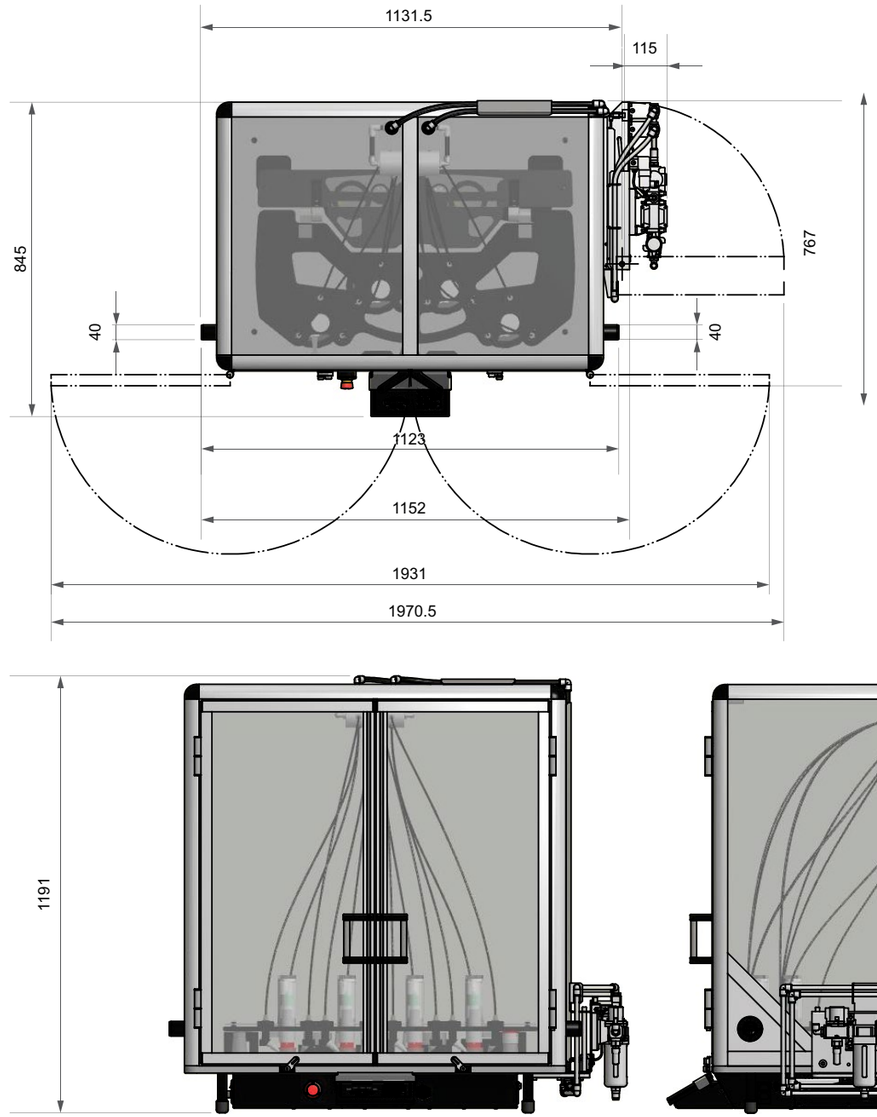
Technical Specification	
Specimen size	15±0.2mm X 15±0.2mm
Speed	5 to 85 rpm min / max
Rubs	1-99999 rpm min / max

Instrument Components (included are the following items - one item unless stated)			
Stock code	**Item name**	**Stock code**	**Item name**
902-952	ElastAbrasion	794-619	ElastAbrasion kit comprising of:
526-050	Pressing weight	794-529	Abrasion station kit x 4
142-326	Mains lead set	526-591	Shim kit - 14 shims x 4
142-358	Bulgin PX0686 plug	526-586	Setting gauge 1mm
142-359	Schurter right angle plug	526-349	Specimen extraction tool
786-707	50g pot grease	381-412	2.5mm ball driver
297-035	Operator's Guide	381-112	3mm ball driver
		381-109	M5 Allen key

Test Material	
Stock code	**Item name**
101-256	P120 abrading discs – 140mm diameter

Cutting Tools	
Stock code	**Item name**
526-800	Press & Cutting tool for ElastAbrasion
526-840	Cutting tool for ElastAbrasion & Adapter for Zwick Press

Dimensions



All the dimensions in these technical drawings are stated in millimetres.

ElastAbrasion is designed to be placed upon on a bench which should be firm, level and capable of supporting 160 kilos. It should be positioned at an ergonomic height for the user to avoid any unnecessary straining whilst accessing the instrument.

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