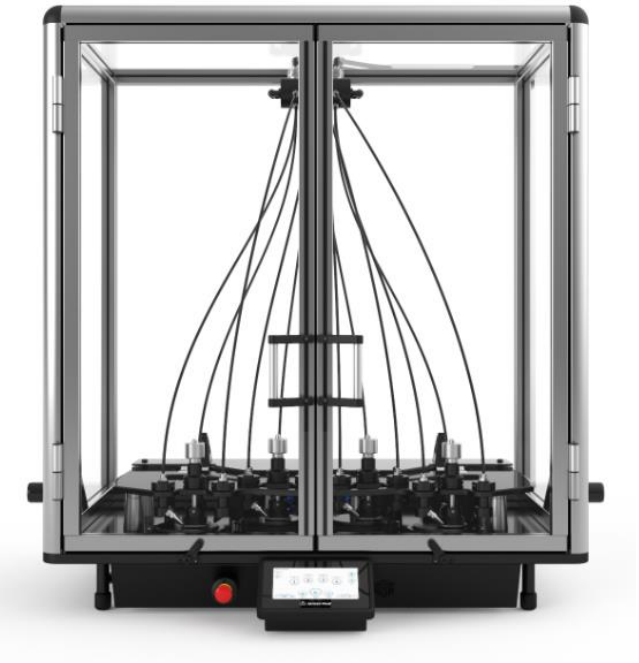
James Heal



OPERATOR'S GUIDE

ElastAbrasion

Elastomer Abrader

Compliant with

- PV 3984
- ASTM D8115

Covering Serial Numbers
1804/18/1000 & upwards

Publication 290-1804-1$A

Setting the Standard

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JAMES HEAL

At James Heal, we are dedicated to designing and developing high precision testing instruments and test materials for physical and colour fastness testing. Our worldwide Service and Calibration division and expert technical assistance complement our product range, adding real value to your laboratory testing activities.

Setting the Standard

We are committed to forming close relationships and have established numerous partnerships within the textile industry, from trade and standards organizations, to test houses, customers and distribution partners.

With a heritage spanning more than 140 years, we have evolved and grown through a culture of continuous improvement, resulting in a thorough understanding of the applications, operating conditions and requirements of customers worldwide – from independent testing Laboratories and test houses, to fabric suppliers, manufacturers and retailers.

Using knowledge and expertise, we consistently set the industry standard through product innovation and technology, with customer and user needs, present and future, driving our technological advancements. You can be assured that with James Heal, you will always receive the highest levels of product quality and customer service. We have Agents and Distribution partners all over the globe, ensuring locally available product whenever, and wherever you need it.

Areas of Expertise

Textile: Colour Fastness

- Chlorinated Water
- Dry Cleaning
- Dry Heat
- Hot Pressing
- Laundering
- Light
- Perspiration
- Phenolic Yellowing
- Print Durability
- Rubbing
- Washing
- Water

Textile: Physical

- Abrasion
- Bursting Strength
- Compression and Puncture
- Crease and Wrinkle Recovery
- Crimp
- Drape
- Durability
- Flammability
- Mass per unit area
- Pilling and Fuzzing
- Security of Attachments
- Seam Slippage
- Shrinkage
- Snagging
- Spray Rating
- Stretch and Recovery
- Surface Deterioration
- Tear Strength
- Tensile Strength
- Washing and Drying

Non-Textile

- Bursting strength of nonwovens, plastics, paper and medical products
- Micro-scratching of laminates, wooden, painted, automotive and high gloss surfaces
- Physical and colour fastness testing of leather
- Rubbing fastness of laminates and wooden surfaces
- Tear strength of paper and plastics

ELASTABRASION - ELASTOMER ABRADER

Our ElastAbrasion has been designed with the James Heal unique product signature and has been produced completely with the user in mind. We have combined the James Heal technical and performance expertise, with intuitive design and operation to produce the most cost effective, ergonomic and user friendly instrument.

Features and Benefits

- Air jet cleaning system
- Automatic controllers ensure efficient use of compressed air
- Specially designed sample holder
- Hinged lift up top plate for easy access
- Versatile and intuitive key pad user interface
- Quick lock clamp rings for easy mounting of abradant
- Unique 'soft lissajous' pattern
- Cabinet to contain debris
- Facility to attach a vacuum hose
- User safety – Instrument will only function when the cabinet is closed
- Variable speed
- Changeable number of rubs
- Standard 18 months warranty
- Test materials - abradant required only
- Negates the need for reference rubber
- Engineering support
- Applications support
- Operator training is available through James Heal
- Tested and approved by Volkswagen
- Multi directional abrasion reflecting real life usage
- Reduction in cost compared with the rotary drum abrader
- Increased productivity – 4 specimens tested simultaneously
- Approximately 50% reduction in variability of results compared with the rotary drum abrader

Air Jets

Each holder is bordered with 3 equidistant air jets supplying a constant 1 bar of compressed air pressure. Any elastomeric debris is blown away from the abrading table, removing the potential for interference with any further abrasion of the specimen.

Specimen Holder

The specimen holder is designed to hold an elastomeric specimen 15±0.2mm X 15±0.2mm with a maximum thickness of 12mm. The packing shims are used to create a protrusion of 2±0.2mm. The collet is held in a fixed position within the holder to avoid movement.

Clean Environment

ElastAbrasion is enclosed in a cabinet; this ensures that the debris produced by the abraded specimens is contained.

Two vacuum attachment points have been included in the cabinet design.

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 ElastAbrasion by fitting an IEC connector to the vacuum wiring and plugging into the instrument; it can then start and stop automatically with each test.

Scope of Application

ElastAbrasion has been designed for determining of the abrasion resistance of elastomers and thermoplastic elastomers.

The instrument conforms to PV 3984, a standard used in the motor industry, developed for engine mounts.

ElastAbrasion allows 4 elastomeric samples to be tested simultaneously.

It eliminates the use the traditional BAM reference rubber to verify the abradant, as each piece of sandpaper is discarded after one use.

The user does not need to attend the instrument to brush away the debris as the compressed air continually blows this away.

Users will see approximately 80% reduction in cost and time over traditional methods, and reduced variability of results.

There is scope to develop test methods appropriate for tyres and shoes, or any other material that currently requires the use of the rotary drum abrader, or other similar methods.

Our innovation team welcome any other requests for further development of this instrument and accessories.

Standards

- PV 3984
  Elastomers and Thermoplastic Elastomers — Determination of Abrasion

- ASTM D8115-17
  Rubber Property — Abrasion Resistance (Multi-Directional Platform Abrader)

INSTALLATION

Safety

ElastAbrasion has a mass of approximately 160kg, therefore suitable lifting apparatus is recommended during installation. This instrument is large and very heavy and should be moved and handled with care.

Dimensions (mm)	Height	Width	Depth	Weight (kg)
ElastAbrasion	1191	1252.5*	869	160

* This is with the pneumatics kit folded into the side of the instrument

Siting & Unpacking

ElastAbrasion is delivered on a wooden palette in a crate. Move the instrument to its final location whilst still inside the crate using either a forklift truck, hydraulic pump truck or other suitable mechanical method.

Check for external damage of the case. Record any damage with photographs and report immediately.

Identify the top and front of the crate by locating the screws. Unscrew the top and front and ensure all screws are removed fully before attempting to remove the instrument.

Remove ElastAbrasion from the crate using a suitable mechanical lifting device with the palette underneath the instrument as a means of lifting; please note that the instrument is not bolted to the palette. Lift the palette and reverse the lifting device backwards in a straight line taking care not to catch the sides of the instrument on the crate. A person situated either side of the crate can offer direction and stability to the crate.

Once the instrument is safely on the floor, carefully remove the packaging materials; take care as mishandling may result in scratching the instrument.

Do not dispose of any packaging material until all standard and optional accessories are fully accounted for. If there are any discrepancies, please contact your supplier immediately.

Lift ElastAbrasion from its palette and into location using a suitable mechanical method, or by hand. If lifting by hand, a minimum of 4 people is required, holding the machine at each corner.

ElastAbrasion should be situated at an ergonomic height on a firm level surface stable and strong enough to withhold the 160Kg weight without movement; it should also contain an electrical supply and compressed air supply.

Read this manual carefully before operating the instrument.

Checklist

Standard Accessories

Please check the serial number plate to confirm that the supply voltage and frequency are in accordance with your order.

Check that the items listed in the table below are present.

Item number	Item name	Quantity
902-952	ElastAbrasion	1
526-050	Pressing weight	1
142-326	Mains lead set	2
142-358	Bulgin PX0686 plug	1
142-359	Schurter right angle plug	1
786-707	50g pot grease	1
297-035	Operator's Guide	1
794-529	Abrasion station kit	4
526-591	Shim kit - 14 shims	4
526-586	Setting gauge 1mm	1
526-349	Specimen extraction tool	1
381-412	2.5mm ball driver	1
381-112	3mm ball driver	1
381-109	M5 Allen key	1

Test Materials

Item number	Item name
701-256	P120 abrading discs – 140mm diameter

Accessories

Item number	Item name
526-800	Specimen Cutting Tool

CONNECTING TO SERVICES

Electrical Connection

Electrical Power Requirements: 85-264 VAC; 2 A; 50/60 Hz; 60W.

Mains electricity must be free from spikes and surges exceeding 10% of nominal voltage.

Connect the electrical power supply to the mains input using the lead provided.

Vacuum Extraction

A vacuum hose can be connected to the ElastAbrasion cabinet to extract any fine debris from the test chamber whilst in use.

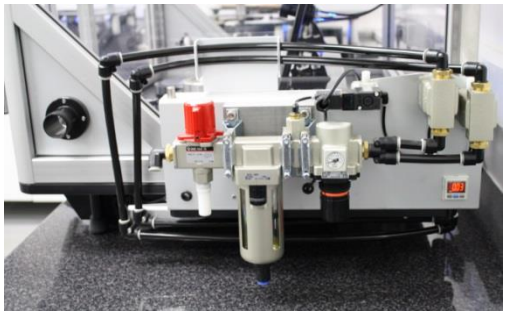
Connect the vacuum hose to either of the 2 connectors located towards the front on both sides of the cabinet.

Only use one of these connectors and leave the other side unblocked to allow air to enter the cabinet.

If a vacuum hose is not used, ensure that the cabinet is cleaned more frequently.

The vacuum cleaner can be adapted to enable it to start and stop automatically with the instrument. The vacuum wiring must be fitted with an IEC connector which is supplied with the instrument; this can then be plugged into the IEC socket in the right hand side of the base of ElastAbrasion.

Compressed Air



The compressed air inlet is situated on the right hand side of the instrument.

Connect the factory air supply to the compressed air input socket using the push-fit fitting.

After this is complete, allow the factory air supply into ElastAbrasion.

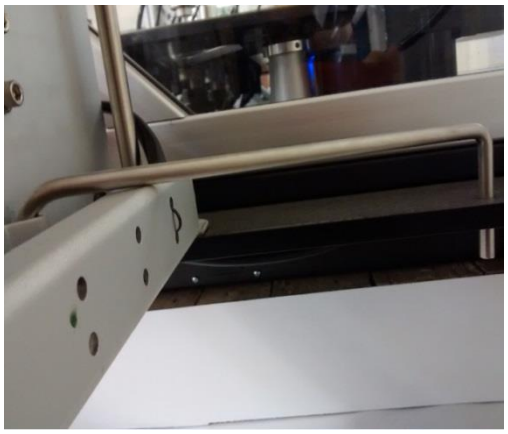
The air pressure to the instrument is monitored here.

The air supply must be capable of supplying 750L/min.

ElastAbrasion requires a pressure of 1 ±0.1 bar.

The regulator will be pre-set to 1 bar – as stated in the standard.

1 bar = 0.1MPa.



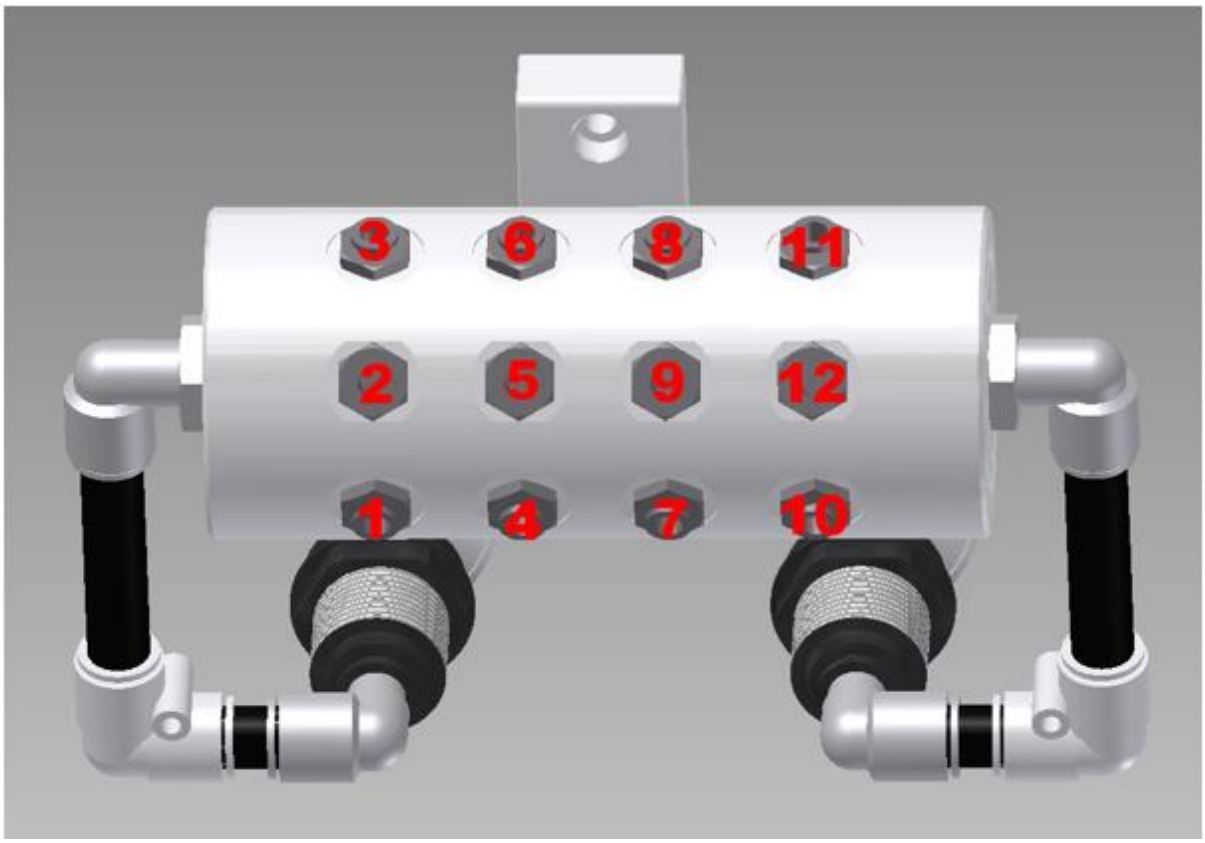
The air regulator is situated on the right side of the instrument. The mechanism can be flush against the cabinet or face front using the support bar located behind the panel.

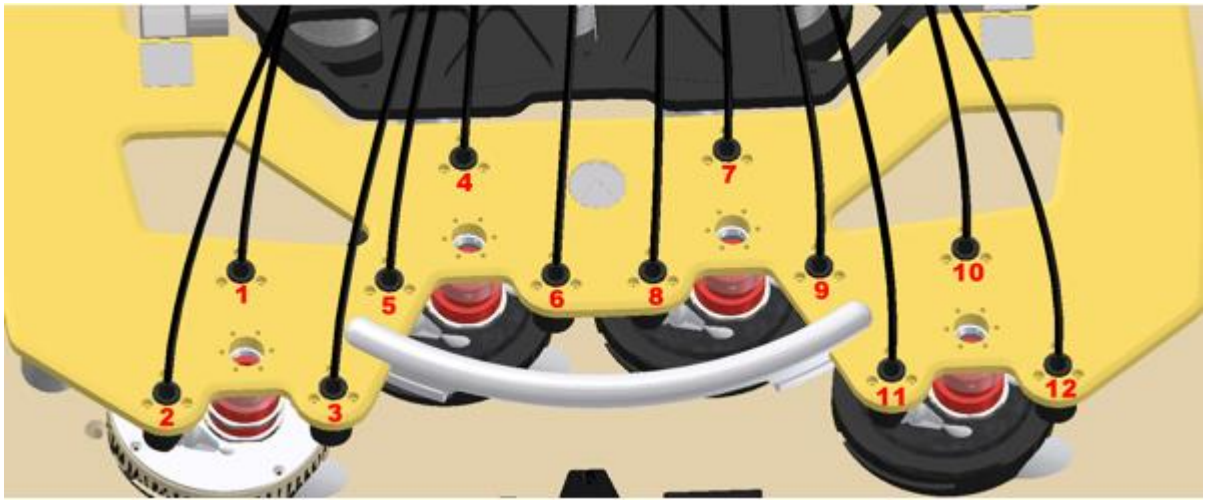
ElastAbrasion consumes compressed air economically.

Once connected, the compressed air supply automatically starts to flow when the instruments starts, and stops at the end of the test.

Airline Layout

If the airlines are disconnected, ensure that they are reconnected in the correct positions as indicated.





OPERATION

Safety

Position ElastAbrasion at an ergonomic height for the user to avoid any unnecessary straining whilst accessing the instrument.

Do not use this instrument for any other purpose.

Ensure the instrument is stable and secure before commencing testing.

ElastAbrasion will stop automatically when the doors are opened.

Push the doors back fully to allow safe access when dressing the instrument.

Using a vacuum hose on one of the 2 connectors located on each side of the cabinet will extract any fine debris from the test chamber whilst in use. Use only one of these connectors and leave the other side unblocked to allow air flow.

Ensure that the lid is pushed back fully before letting go.

Emergency Stop

The emergency stop button is located on the front left of ElastAbrasion. It is designed to bring the drive mechanism to an immediate halt in an emergency situation once pressed.

When pressed, the button will hold in the stop position.

Attempting to start a test with the switch in the stop position will result in a warning message being displayed.

To unlock the button, twist the red cap in a clockwise direction.

Setting up ElastAbrasion

The Abradant

Access ElastAbrasion by releasing the door safety catches and open both doors simultaneously using the handles.

Lift the lid by the handle and push back fully to allow access to the abrading tables.

Place one (1) piece of abrasive paper on the first abrading table. Carefully place the pressing weight centrally onto the paper and feel that it remains central.

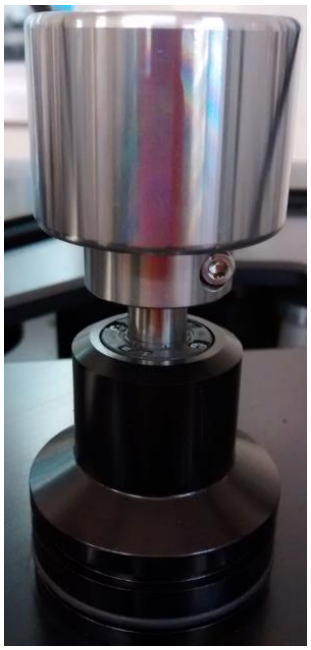
Place the Quick-lock clamp ring onto the three (3) locking pins and twist in a clockwise manner with a slight downward force.

Remove the pressing weight and ensure that the abradant is secure. Repeat for the remaining three (3) abrading tables.

Carefully lower the lid.

The abrasive paper must be removed and discarded after each use.

The Spindle, Collar and Weight



For non-routine testing, it is recommended that the collar and weight are set using a 1 mm setting gauge. Please refer to the instructions below for setting up in this manner.

For normal use, the weight and collar can be set at the top of the spindle.

To do this, feed the collar and then the weight onto the top of the spindle. Hold, and turn upside down to rest on the table so that the weight is flush with the top of the spindle. Secure both the collar and weight with the 2.5 mm ball driver.

With the weights now fixed to the top of the spindle, align the spindle groove with the raised channel inside the bearing housing in the plate above each of the abrading tables.

Insert the spindle fully. This is now in a fixed position and will not rotate.

The 1 mm Setting Gauge

If testing rubber for the first time, it is recommended that the 1mm setting gauge is used when setting up the instrument. This preserves the sample holder whilst testing any elastomeric material that may potentially abrade more than 1mm in depth.

Place the 1 mm setting gauge on top of the abradant.

Place the **empty** assembled sample holder on top of the setting gauge and secure through the bearing housing with the spindle.

Place the split collar onto the top of the spindle, allow to slide down and lock in place with the 2.5 mm ball driver.

Add the weight to the spindle and lock in place using the 2.5 mm ball driver.

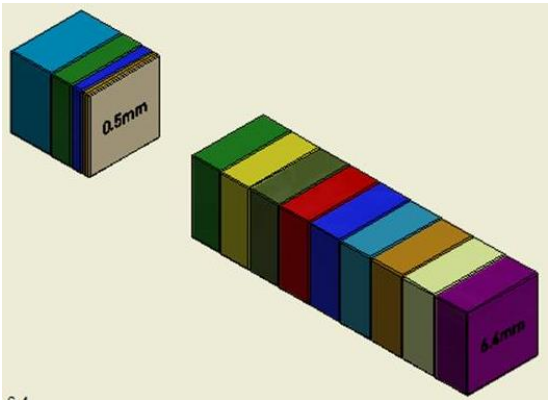
Remove the setting gauge.

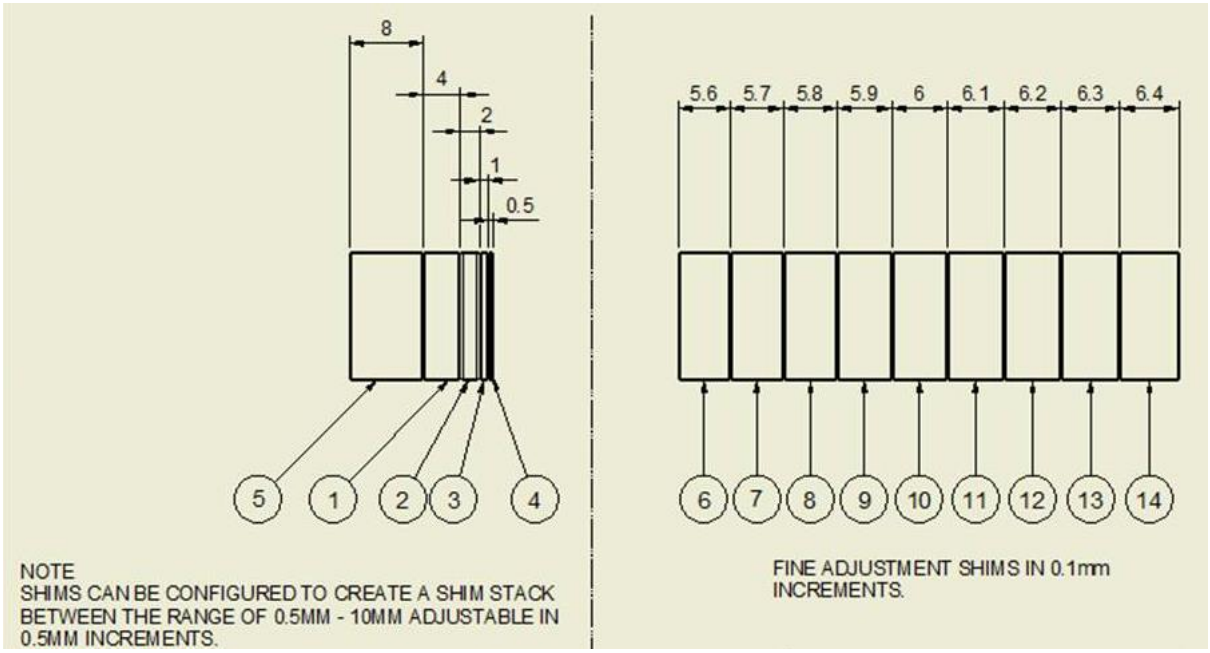
Mount the specimens as described in ‘Mounting the Specimen.’

The Shim Kit

Four shim kits are supplied with the ElastAbrasion; each with 14 shims of varying thicknesses.

The shims allow the specimen to be packed into the holder with accuracy giving a 2 ± 0.2 mm protrusion.





Mounting the Specimen

The specimen holder accommodates different sample thicknesses to a maximum of 12 mm. The square specimen can be created using the specimen cutter (see separate Operator's Guide) and should be 15 ± 0.2mm x 15 ± 0.2 mm.

Locate the collet onto the four (4) silver pegs in the black top section of the holder. The collet consists of four (4) parts which holds the square sample firmly in place without movement.

Estimate and add the shims required to give a protrusion of 2 ± 0.2 mm.

Add the specimen.

Screw on the silver bottom section. Hold the specimen in with a thumb specimen and fingers on the top black section.

Check the protrusion is 2 ± 0.2 mm and flat using a caliper; adjust until this is achieved.

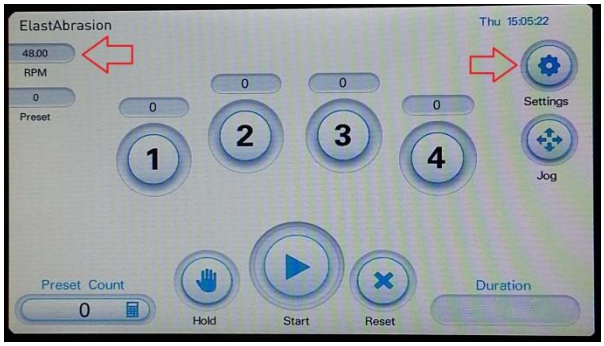
Once assembled, place onto the abrading stations and push the spindle already inserted into the bearing housing, into the top of the holder.

If the spindle will not insert easily, lift the holder slightly to ensure that it is square to the spindle.

ElastAbrasion is now ready for use.

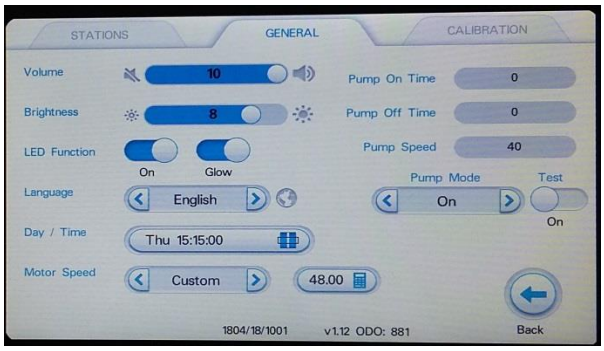
Control Panel

Setting the Speed



The default speed is 48 rpm.

To access Settings, press the Gear icon.



Ensure the correct day of the week and time of day is set correctly.
If not, the predicted finish time will be incorrect.

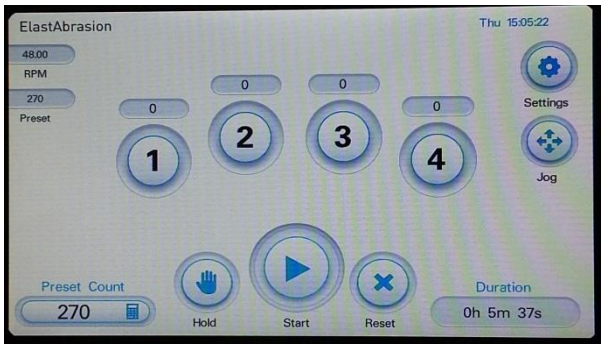
To return to the main screen, press the Back arrow.

Selecting the Number of Rubs

Press the Preset Count icon

The numeric keypad is displayed.
Enter 2 7 0 and press the Tick key. To add the preset to a radio button, press and hold the radio button for a few seconds.

Starting



The duration of the test is indicated.

To Start the test, press the Start/Play button.

The compressed air starts to blow through the nozzles automatically.

The individual station counters count upwards towards the Preset value.

The Preset Counts down while the test is running.

The estimated time of day to completion is indicated.

When the test completes an audible tone sounds from the speaker.

The Test End is indicated by a tick symbol.

The compressed air is switched off automatically.

Resetting the Counters

To reset all the counters, press and hold the Reset button. Press the Tick key to confirm resetting.

Summary of a Test Procedure

For details on how to set up and use ElastAbrasion, see the relevant sections.

The following test method is based on PV 3984.

With the stations empty, lift the lid and push it back as far as possible.

In turn, place a sandpaper disc on each of the 4 tables and add the pressing weight centrally - do not slide the weight on the sandpaper as this will impair the performance.
Add the quick lock clamp rings on each table and secure tightly.

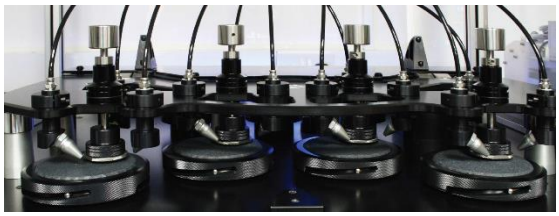
Carefully lower the lid.

Using the specimen cutter (see separate operator's guide), create 4 square specimens 15±0.2mm X 15±0.2mm.

Weigh the specimens to the nearest mg and label the backs 1 through to 4.

Selecting from the shim kit provided, pack out the specimen sufficiently to produce a 2±0.2mm protrusion.

Using a caliper, ensure that the face of the specimen is flat and has the correct protrusion.



Place the holder onto the table under the bearing housing – add the spindle with collar and weights in each of the 4 stations.

Close both of the doors and apply the two (2) safety catches.
Set the speed to 48 rpm.
Set ElastAbrasion to 270 rubs.
Press Start and the test will begin and the air will be supplied automatically.

The test will complete in 5 minutes 39 seconds and the air will stop.

Remove the specimens and re-weigh.

Calculate the volumetric wear for the 4 specimens and determine the mean and standard deviation.

Remove the sandpaper discs and discard.

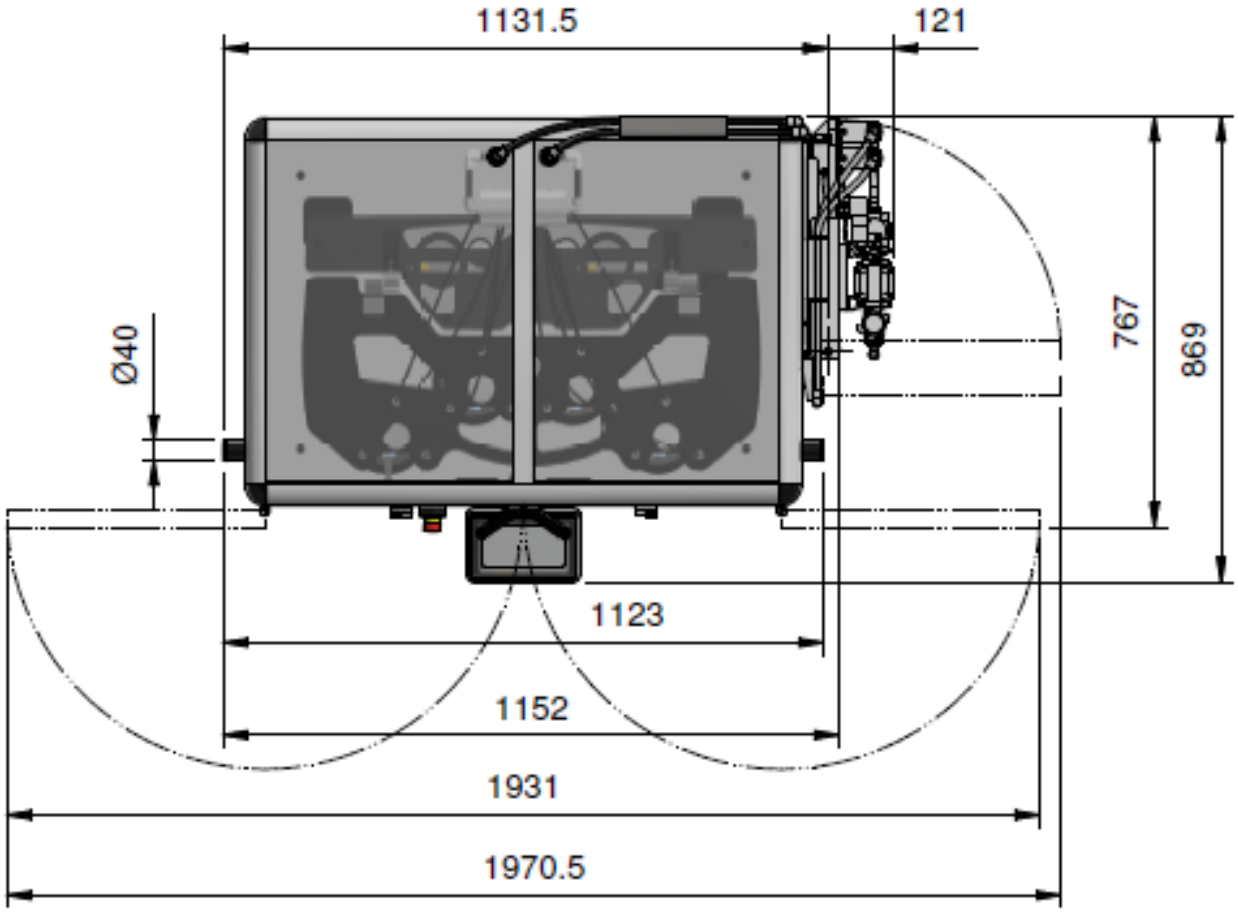
Use 4 new pieces for every test.

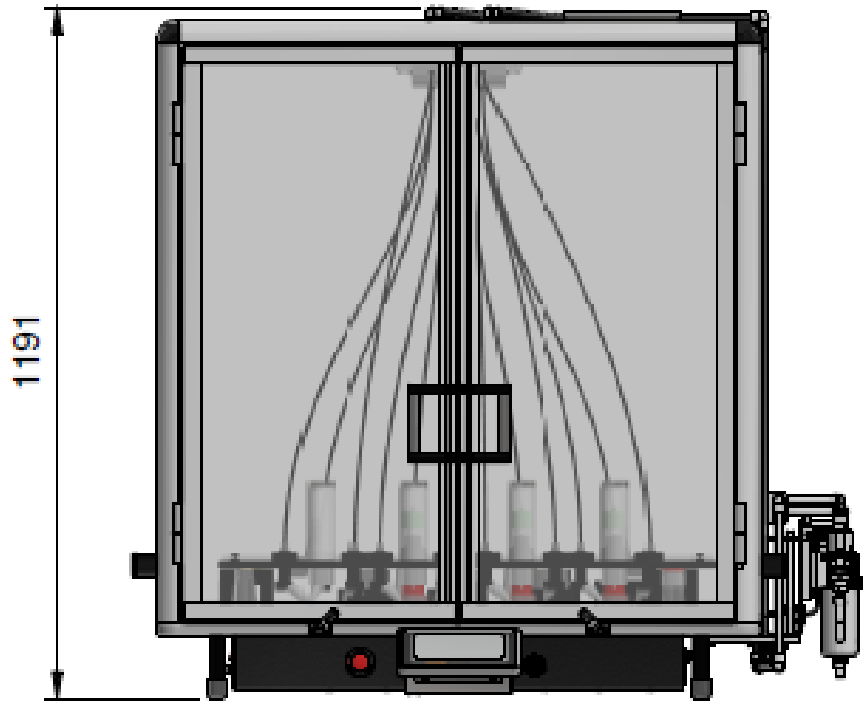
TECHNICAL DATA

Instrument Specification

- Calibration Service UKAS accredited (based on ISO 17025)
- Weight 160 kg (approx.)
- Power Supply 110-230 V ± 10%, 50/60 Hz, 60 W
- Mains electricity must be free from spikes and surges exceeding 10% of nominal voltage - Universal Voltage & Frequency
- ElastAbrasion utilises factory supplied compressed air - the air supply must be capable of supplying 750L/min
- Compressed air is required at 1±0.1 bar (0.1MPa).
- ElastAbrasion fully complies with CE regulations.

Dimensions

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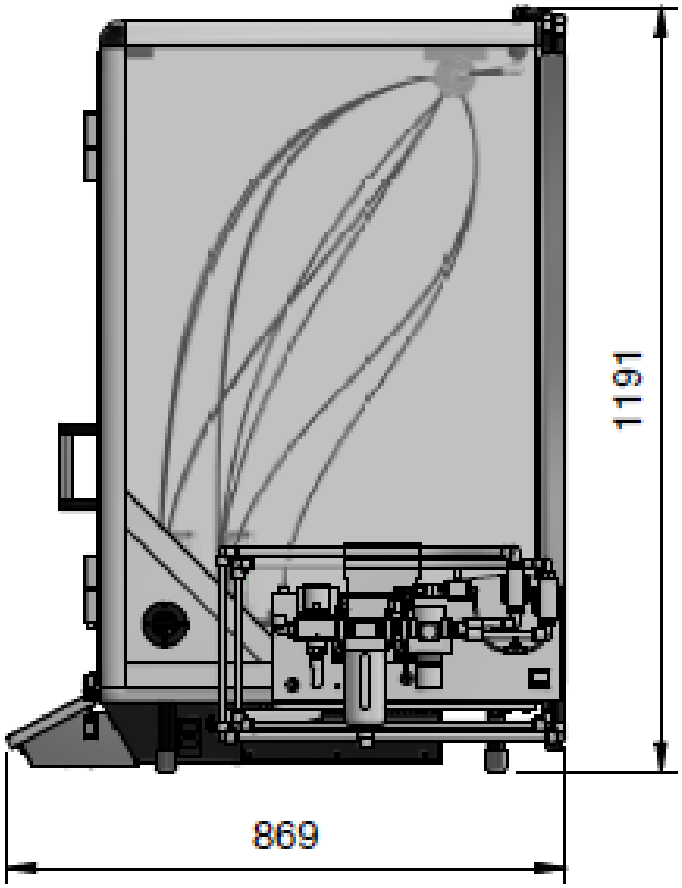
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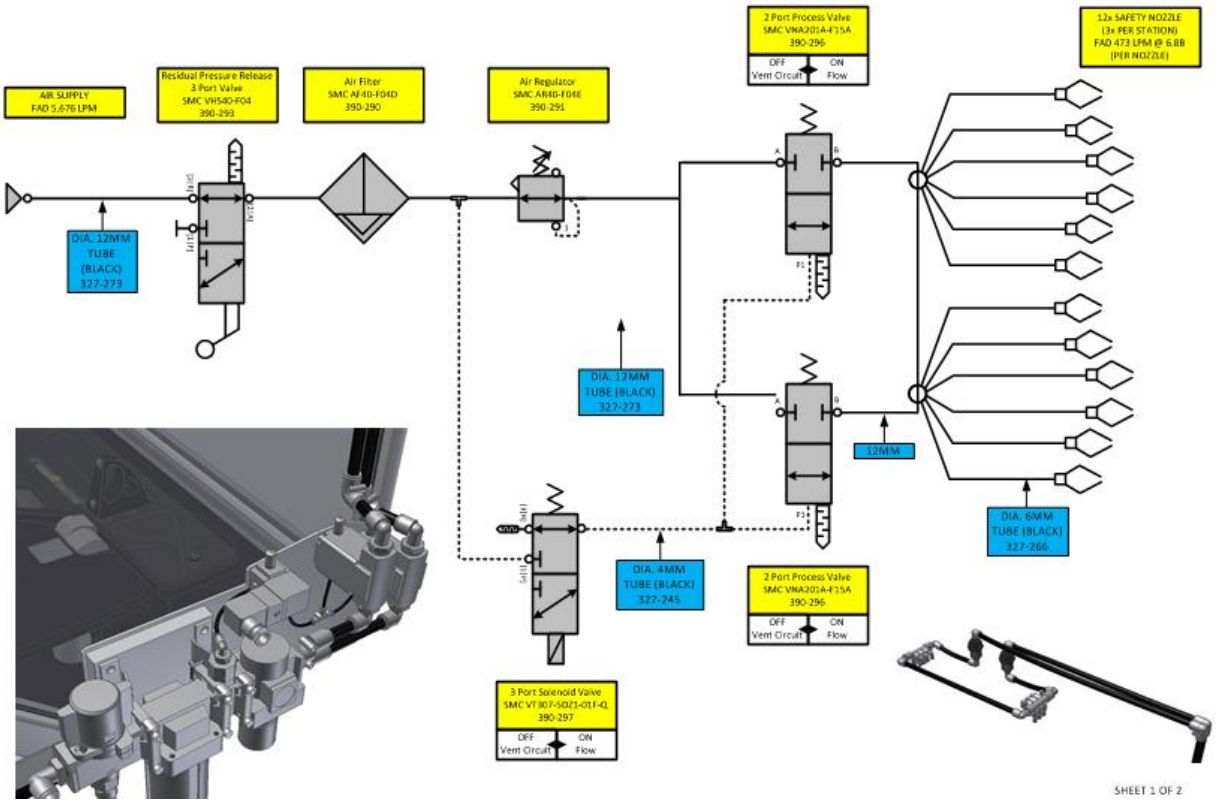
Pneumatic Scheme



CARE AND MAINTENANCE

User Servicing

Periodically inspect the abrading tables, clamp rings, sample holders, and spindles. Damaged or worn parts should be replaced.

Keep the instrument as clean as possible by removing accumulated debris from all parts, particularly from the drive slots and drive pegs. Clean inside the cabinet when required using a vacuum hose.

Ensure that there is no vibration whilst in use. If this occurs, use the grease to lubricate dry working areas.

Ensure the instrument is isolated from the electrical supply before removing any covers. Covers should only be removed by a qualified Engineer or Electrician.

It is recommended that the instrument is serviced and calibrated at least once a year by a James Heal Service and Calibration Engineer.

CE Conformity

ElastAbrasion is CE marked and therefore complies with the following directives:

- Machinery Directive 2006/42/EC
- Low Voltage Directive 2006/95/EC
- Electromagnetic Compatibility Directive 2004/108/EC

For more information regarding the CE marking and accreditation please contact James Heal.

Disposal of ElastAbrasion

ElastAbrasion also complies with:

- Waste Electrical and Electronic Equipment recycling (WEEE) Directive 2012/19/EU
- Restriction of Hazardous Substances (RoHS) Directive 2002/95/EC

For advice on the correct disposal of this equipment please visit:

http://www.hse.gov.uk/waste/waste-electrical.htm

James Heal Service & Calibration

James Heal Service & Calibration Service is an ISO 17025 based comprehensive worldwide support programme covering installation, operator training, regular maintenance, UKAS calibration and on-line technical and applications support.

Our instruments come with an 18 months warranty period.

Our aim is to provide precisely the services you need to maintain and protect the value of your investment.

In all communications please quote the serial number of your instrument and the software version number, for example: 1309S/14/1003 and V1.00.

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REVISION HISTORY

See front cover for publication number, e.g., 290-1804-1$A.

Revision	Date	Originator	Details Of Revision
A	23/08/2018	SEW	Original release