James Heal

OPERATOR'S GUIDE

Mini-Martindale Abrasion Tester
Model 1302W for Wood, HPL and Similar Substrates

Covering Serial Numbers:
1302W/13/1001 and upwards

James H. Heal & Co. Ltd.
Halifax, England

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Setting the Standard

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Background

Thank you for investing in the **Martindale 1300 Series** from **James Heal**.

James Heal would like to assure you that we are committed to providing you with first class Instruments, Quality Assured Consumables, excellent Customer Service and Support. You are part of a growing global community who considers James Heal products to be of the highest quality whilst offering excellent value for money.

We were the first to launch a feature-packed, six-station machine, incorporating a unique and patented hinged top plate. Later, we conceived and launched the very successful and versatile, single-station Mini-Martindale. Then the same award-winning Team brought you the revolutionary Nu-Martindale 864, copied by many of our competitors worldwide.

Now we bring you the **1300 Series of Martindale Abrasion and Pilling Testers** which are the absolute ultimate for flexibility and ease-of-use.

The 1300 Series comprises three (3) instruments:

- Model 1309 Maxi-Martindale Nine (9) station instrument
- Model 1305 Midi-Martindale Five (5) station instrument
- Model 1302 Mini-Martindale Two (2) station instruments for special applications

Features and Benefits

A commitment to continuous investment in the latest design and manufacturing technology enables James Heal to bring superior quality and feature-rich instruments such as the 1300 Series of Martindale Abrasion and Pilling Testers within the reach of the whole Textile Testing Community.

New features and benefits include:

- Can be used for many other applications
- Complies with all known Martindale standards and test methods
- Versatile and intuitive Key Pad User Interface
- Individual station counters and totaliser
- Easy change of motion
- Comfortable and easy access to every station from the front, without removing the top plate
- Finger grips to facilitate (when required) removal of top plate
- Low power consumption
- Higher speed for accelerated testing (x1.5)
- UKAS Calibration
- Standard 18 months warranty
- Real value for money

Standards

The 1302W Mini-Martindale Abrasion Tester complies with the following standards:

- EN 16094:2012
  Laminate floor coverings. Test method for the determination of micro-scratch resistance

- IHD-W-445

The 1302W Mini-Martindale is as described in ISO 12947-1.

The Holder for scrub material is as described in ISO 12945-2 and is able to provide a force of 4N or 6N.

It is essential that reference be made to the appropriate standards as well as to performance specifications issued by your customers/buyers.

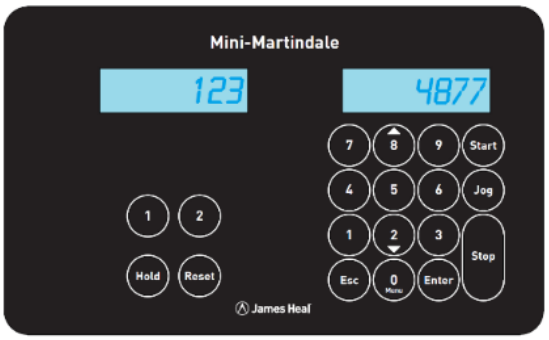
Introduction to Getting Started

In response to market demand Heals have designed and manufactured the Martindale 1300 Series™ of Abrasion Testers. The 1300 Series comprises three (3) instruments:

- Model 1309 Maxi-Martindale Nine (9) station instrument
- Model 1305 Midi-Martindale Five (5) station instrument
- Model 1302 Mini-Martindale Two (2) station instruments for special applications

This Quick Start Guide describes the use of Model 1302W which is primarily designed for the testing of wood, high-pressure laminates and similar substrates.

The Control Panel

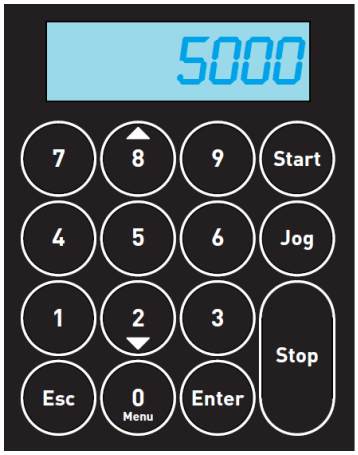


Using the Control Panel

The following gives brief instructions for setting the Preset Counter and using the Totalisers.

Setting the Preset Counter

The Preset is the number of rubs required for the current interval of testing, in this example 5000 rubs.
You can enter a new Preset value at any time the instrument is not running.



Preset Counter:
Type in a number from
1 to 999,999

Press Escape if you make a mistake

Press **5 0 0 0**
Followed by the **Enter** key

If you make a mistake while entering the Preset value then press the **Esc**ape key

Starting and Stopping

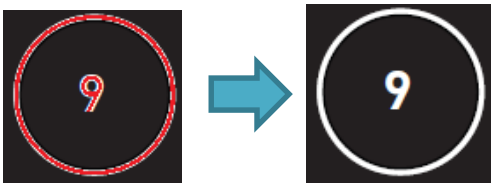
After setting the Preset Counter to the required number of rubs, press the **Start** key.
The instrument will run until the Preset value counts down to zero at which point the instrument will stop, ready for inspection.

If required, the **Jog** key is used to make small movements of the Top Plate while replacing felt, abrasive cloth, etc, therefore providing better access to the abrading stations. This removes the need to manually lift the Top Plate.

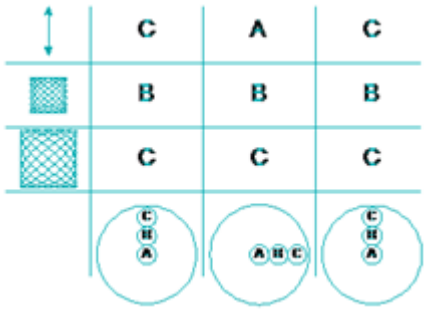
You can stop the instrument at any time by pressing the **Stop** key.
The Emergency Stop button will also stop the instrument.
The Emergency Stop button must be reset before the instrument will start again.

Using the Totalisers

This sections illustrates how to Select, Reset, Reset All and Hold the Totaliser Counters.

To select Totaliser #2	Press 		Totaliser #2 is displayed
To Reset a Totaliser	Press 		Totaliser #2 is Reset to zero
To Reset all Totalisers	Press and hold  for 2 seconds		All Totalisers are Reset to zero
To switch a Totaliser On or Off			Station Key #2 changes colour: White = ON Red = OFF
To switch all Totalisers On	Press and hold  for 2 seconds		All Red Station Keys turn White (On)

Changing the Rubbing Motion



The instrument is supplied with the Drive Pegs in position C ready for abrasion testing. To change the motion, remove the Top Plate and set the Drive Pegs as required: Straight Line, 24mm Lissajous or 60.5mm Lissajous.

It takes 16 rubs to make a complete Lissajous figure.

Less Frequently Used Functions / Preferences

The less frequently used functions can be accessed by pressing the Menu / 0 (zero) key.

Applications

This information is supplied to aid the user carry out testing in conjunction with standards and test methods. Therefore it is not a replacement for these documents. The information and advice supplied is of a generic form and for more specific and detailed information the standards, test methods and specifications should be consulted. Information is provided for EN 16094 - Laminate floor coverings - Test Method for the determination of micro-scratch resistance.

Scratch Resistance Test

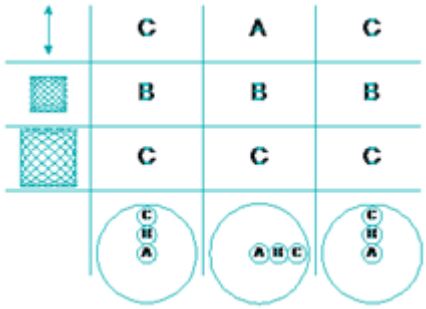
Summary

The specimen is fixed on a horizontal Abrading Table. A circular scrub material fixed on a Holder rubs on the specimen with a defined load/force and motion. The Holder moves perpendicular to the Abrading Table in a translational movement tracing a Lissajous figure. The Holder is additionally free to rotate around its own axis perpendicular to the horizontal plane. The specimen is exposed to the scrub material for a predetermined number of rubs after which any changes to the surface of the specimen are assessed.

Details

EN 16094 describes two procedures, Procedure A for assessing changes in gloss and Procedure B for assessing scratch resistance.

Test Parameter	**Procedure A**	**Procedure B**
Scrub Material 3M reference James Heal stock code Colour	Very Fine SB 7447 789-672 Maroon	Medium Fine SB 7440 789-671 Brown
Holder for Scrub Material	Version 1 6N Holder + Ring Weight	Version 2 4N Holder only
Speed Factor	1	1
Assessment	Gloss Change using Reflectometer	Visual Assessment to scheme in Annex B of EN 16094



Assemble the Martindale Abrasion Tester so that all three (3) of the Drive Pegs are in position C indicated in the diagram to the left.

This will produce a large Lissajous with a width of 60.5mm.

(Position B produces a small Lissajous of 24mm).

Ensure the Abrading Tables are free from adhesive residues.

Replace the Top Plate.

Using Double-Sided Adhesive Tape, fix the specimen to the Abrading Table.

Using Double-Sided Adhesive Tape, fix the scrub material to the Holder.

This illustration shows the arrangement for Procedure A.

This illustration shows the arrangement for Procedure B.

Note that the additional Ring Weight is <u>not</u> used in Procedure B.

Recommended Accessories and Consumables

794-519	4 x Station Kits (including weights for 4N loading) for Wood, HPL and Similar Substrates
525-688	4 x Additional Weight for 6N loading
789-671	5 x Pack (10) 3M Scotch-Brite Abradant Pieces (89mm diameter) Type 7440 (Brown)
789-672	5 x Pack (10) 3M Scotch-Brite Abradant Pieces (89mm diameter) Type 7447 (Maroon)
202-402	UKAS Certificate of Calibration for Mini-Martindale Abrasion Tester (up to 2 positions) - Wood

Optional Accessories

788-761	**Lissajous Figure Marker Pen** For checking the Lissajous Figure according to EN ISO 12947-1
788-760	Lissajous Figure Recording Paper - per pack (50)

Consumables

789-671	3M Scotch-Brite Abradant Pieces (89mm diameter) Type 7440 (Brown) for EN 16094 (Method B) - per pack (10)
789-672	3M Scotch-Brite Abradant Pieces (89mm diameter) Type 7447 (Maroon) for EN 16094 (Method A) - per pack (10)

Calibration

202-402	UKAS Certificate of Calibration for Mini-Martindale Abrasion Tester (up to 2 positions) - Wood

Safety

- The instruments are very heavy, therefore do not attempt to lift without suitable lifting apparatus or use two or more able-bodied people.

    - Mini-Martindale 1302 40 kg
    - Midi-Martindale 1305 59 kg
    - Maxi-Martindale 1309 80 kg

- The 1300 Series Martindales comply with the CE regulations in full. See Compliance Statements.

- The 1300 Series Martindales have been specifically designed with operator health and safety in mind. These instruments ensure the minimum of operator stress and fatigue, and is virtually silent in operation to suit the laboratory environment.

- Care should be taken when lifting the Top Plate.

- Care should be taken to prevent anything heavy (e.g., weights) from impacting on the Control Panel.

- Care should be taken to avoid placing the hand between the Abrading Stations and the Top Plate whilst in motion.

- Leave sufficient space around the instruments to allow unrestricted and safe operator access. See Installation section.

Emergency Stop

This switch is designed to bring the drive mechanism to an immediate halt in an emergency situation.

When pressed the switch will latch in the stop position.

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

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

Cleaning

- Periodically inspect Abrading Tables for indents. Damaged Abrading Tables should be replaced.
- Periodically inspect the Sample Holders and Spindles for signs of damage. Damaged or worn parts should be replaced.
- Keep the instrument scrupulously clean. Remove accumulated debris from all parts. Clean up oil and grease stains immediately.
- Keep the Spindles clean. A trace of light oil applied via a cloth is recommended in a high humidity environment.
- Keep the Drive Slots and the Drive Pegs free from debris.
- Use only a dry soft cloth when cleaning the Control Panel. DO NOT use any solvents or abrasive cleaning agents.

Service and Calibration

User Servicing

- At approximately monthly intervals, clean away any oxidised or contaminated grease from the Drive Pins, Bushes, Drive Slots and Wear Plates and re-apply fresh 1300 Series Martindale Grease to the same areas using the Plastic Spatula provided. See Replacement Parts (Spares), below.
- Mains electrical fuses are located in the power inlet socket, located at the left-hand side of the instrument.
- To replace the fuses, remove the mains cable from the power inlet. Open the fuse drawer to expose the fuse cartridge. Fit a new 2A and 1A 20mm anti-surge fuses. The 2A fuse is fitted to the 110V side and the 1A is fitted to the 220V side of the carrier.

Service and Calibration Support

The Martindale 1300 Series of Martindale Abrasion and Pilling Testers are world-class products, fully supported by our world-leading Maintenance and Calibration Service - covering installation, operator training, regular maintenance, UKAS Calibration and on-line technical and applications support.

Servicing and calibration are available Worldwide – Contact our Service & Calibration Support department for further details.

Service & Calibration Support email : support@james-heal.co.uk

Replacement Parts (Spares)

130-825	Fuse 1A (2)
130-853	Fuse 2A (2)
195-425	Voltage Surge Suppressor (1)
526-101	Spindle Guide Assembly with needle bearings (2)
304-663	Liner Bush (3)
383-400	480T Timing Belt (2)
383-405	720T Timing Belt (1)
526-007	Drive Pin (3)
526-009	Bearing Pad (3)
786-707	1300 Series Martindale Grease - per pot (approx. 50 g) (includes plastic spatula)

Unpacking

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

Remove any staples, wire strapping and adhesive tape.

Lift out the top box, containing the accessories.
Remove the adhesive tape and ensure that all accessories are present.

Using both hands remove the outer sleeve.
Carefully remove the instrument from its packing case and place it on a firm, flat surface.

The instrument weighs approximately 40 to 80 kg depending on the model, therefore do not attempt to lift without suitable lifting apparatus or use two or more able-bodied people.

Installation

Stand the instrument on a firm, level table or surface (Lifting equipment required).
Lower the top plate so that each of the three (3) Drive Pegs locates into the three (3) Drive Slots.
Ensure the Top Plate is resting on the three (3) Bearing Pads.

Connect the instrument to the correct electrical supply using the mains lead supplied.

Power Requirements	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)

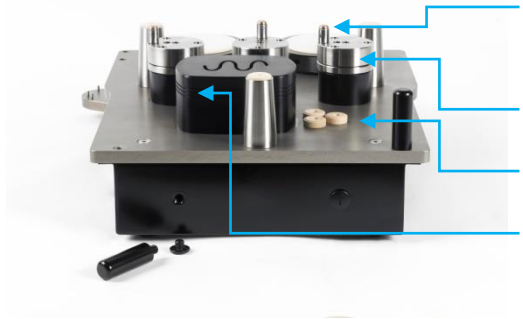
	Depth	Height	Width	Weight
Mini-Martindale 1302	670 mm	320 mm	460 mm	40 kg
Midi-Martindale 1305	670 mm	320 mm	700 mm	59 kg
Maxi-Martindale 1309	670 mm	320 mm	890 mm	80 kg

Identification of Parts

This illustration shows a Mini-Martindale 1302W.

Unscrew the two (2) Support Bars and screw into the rear of the instruments. In this way they act as spacers giving adequate clearance at the rear of the instrument.

Support Towers with Bearing Pads (support for Top Plate)

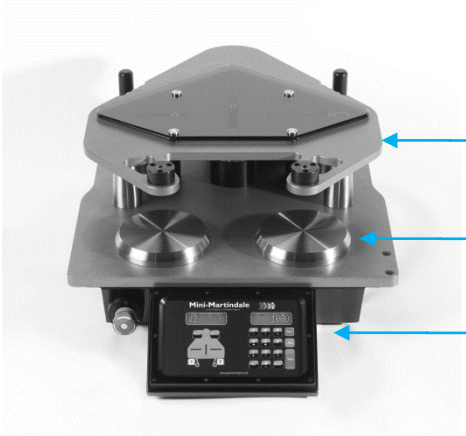


Drive Pegs (position can changed to allow different types of motion)

Drive Towers

Spare Bearing Pads

Motor Housing (do not cover the ventilation slot)



Top Plate

Abrading Tables

Control Panel

Left-hand side view of instrument.

Base Plate

Emergency Stop Button (front left hand side)

Power Lead connection with Power Switch above

Compliance Statements

CE Compliance

The 1300 Series of Martindale Abrasion and Pilling Testers are CE marked.
It therefore complies with the following directives:

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

Specifications

Standard	EN 16094
Number of specimens	Up to 2
Exposed area of test specimen	144 cm^2
Working pressure on test specimen	Procedure A 0.63 kPa (4N) Procedure B 0.94 kPa (6N)
Rotational Speed	47.5 ± 2.5 rpm (optional non-standard x1.5 speed available)
Total stroke of drive units	60.5 ± 0.5 mm 24.0 ± 0.5 mm
Parallelism of top plate to abrading tables	0.05 mm
Maximum circumferential parallelism of sample holders to abrading tables	0.05 mm

Dimensions and Weights

	Depth	Height	Width	Weight
Mini-Martindale 1302	670 mm	320 mm	460 mm	40 kg
Midi-Martindale 1305	670 mm	320 mm	700 mm	60 kg
Maxi-Martindale 1309	670 mm	320 mm	890 mm	80 kg

Revision History

See front cover for Publication number, e.g., 290-1302W-1$A.
The letter following the dollar symbol shows the revision status of the document.

Rev	Date	Originator	Details of revision
A	01-06-13	PG	First release
B	01-06-15	PG	1302W update