

# Martindale

## ABRASION & PILLING TESTER

The James Heal abrasion and pilling tester, with the adaptability to test a wide range of applications, is the instrument of choice for many of the world's leading laboratories and global retailers.

Now with the James Heal touchscreen, the user has access to the most intuitive and simple to use Martindale on the market.

<b>MODEL NUMBER:</b>	<b>1600 Series</b>
<b>STOCK CODE:</b>	<b>902-964 Martindale (9 station)</b>
	<b>902-965 Martindale (5 station)</b>
	<b>902-966 Martindale (2 station)</b>



## KEY BENEFITS

### PEDIGREE & EXPERTISE

Our position as the leading supplier for the Martindale has been established by over 60 years of testing and development, and the sale of thousands of instruments worldwide.

### VERSATILE & ADAPTABLE

James Heal's comprehensive Martindale model range comes with 2, 5 and 9 stations, which can be equipped with kits to test a range of applications.

### TOUCHSCREEN

Designed with users in mind, the new intuitive touchscreen will ensure that the James Heal Martindale is the most simple to use and efficient instrument in the market.

### EASILY ACCESSIBLE

The design of each instrument enables ergonomic access to all stations from the front. The 9 station model has a hinged lid for easy access.

### QUICK LOCK CLAMPING RINGS

Precision quick lock clamping rings secure test materials in place with ease, reducing set up time.

### FULL RANGE OF TEST MATERIALS

We manufacture, process, test and package the original Martindale test materials in house. They undergo rigorous testing procedures before being available locally around the world.

### SERVICE & SUPPORT

Engineers with years of field experience offer high quality, comprehensive calibration to keep your instrument in prime condition.

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## APPLICATIONS

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WOVEN & KNITTED FABRICS



LEATHER



SOCKS



CARPETS



COATED FABRIC FOR UPHOLSTERY



EDGES ON COLLARS, CUFFS, BAGS

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## THE TESTS

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### Abrasion

Abrasion is the surface wear caused by rubbing with another material. The consumer would expect textiles and other products to withstand a certain amount of deterioration.

The abrasion test on the Martindale takes a specimen and rubs it against an abrasive material in the shape of a lissajous pattern.

### Pilling

Pilling is the formation of small balls of entangled fibres on the surface of the fabric, a deterioration which is generally unacceptable to the consumer.

The pilling test on the Martindale passes a test specimen over the same or an abrading fabric at a defined force in the shape of a lissajous pattern.

Arcadia		bsi.
Arcadia	ASTM	BS
Arcadia AG35 Arcadia AG32 Arcadia AG34 Arcadia AG33	Arcadia AG61 Arcadia AG75 Arcadia AG26	ASTM D4966 ASTM D4970
		
EN	EN ISO	ISO
EN 13520 EN 14325 EN 14465 EN 14605 EN 343 EN 388 EN 530	EN 943-1 EN 943-2 EN 13770 EN 15973 EN 16094 EN 16094:2012	EN ISO 12947 EN ISO 12945-2
		
ALCA	M&S	Next
IUP 48-2 IUP 53-1	M&S P19 series M&S P17 M&S P18C	ISO 17704 ISO 5470-2 ISO 17076-2 ISO 26082-1 ISO 12947-1 ISO 12945-2
		
VDA	Volvo	Woolmark
VDA 230-211 VDA 230-212	Volvo 1024, 7122	Next 18 series Next TM26
AS	IHD	IS
AS 2001	IHD-W-445	IS 12673
IWTO	PV	SABS
IWTO 40	PV 3975	SABS 1009
SFS	SN	TWC
SFS 4328	SN 198525 SN 198529	TWC 112

# HISTORY OF THE MARTINDALE

Since our involvement in the creation of the first Martindale, we have continued to develop and improve our flagship instrument. We have sold thousands of Martindales in this time, underpinning our position as a leading supplier.



**Martindale 403**

The early 1990s saw a redesign of the instrument introducing our innovative 6 station Martindale with quick locking clamp rings and a hinged top plate

**1950s**



**Martindale 103**

James Heal worked with Dr. Martindale of WIRA to design one of the first Martindale Wear and Abrasion test instruments

**1990s**



**Martindale 406**

Launched at the ITMA exhibition in Paris, the 406 set a new benchmark in design and functionality with clear LCD screen and auto restart

**1999**



**Martindale 864**

Our next innovation offered choice for the user with 4, 6 or 8 stations with ergonomic top plate design for easy access and optional variable speeds

**2003**



**Martindale 909**

Inspired by over 60 years' accumulated knowledge and expertise the 900 Series was focused on our core values of Innovation, Precision & Pedigree

**2010**



**Martindale 1309**

The 1300 series introduced a hinged top plate to allow easy access every station from the front to reduce time to load and unload

**2014**

**2016**



**Martindale 1600 Series with Touchscreen**

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## THE JAMES HEAL MARTINDALE RANGE

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### **2 Station Mini Martindale**

- Abrasion and Pilling
- 1302PV for Volkswagen Test Method PV 3975



### **5 Station Midi Martindale**

- Abrasion and Pilling



### **9 Station Maxi Martindale**

- Abrasion and Pilling
- Wet and dry models available

# MARTINDALE AT A GLANCE

Available with 2, 5 and 9 stations

Hinged top lid, available on 9  
station model



Quick lock clamping  
rings for efficient  
loading of samples

Emergency stop buttons  
for user safety

Integrated touchscreen  
with easy to use controls,  
individual hold function  
and test completion time.

All stations accessible  
from the front

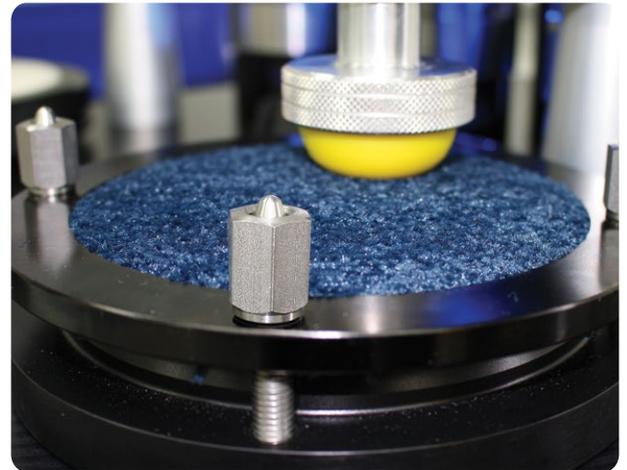
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### VERSATILE & ADAPTABLE

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James Heal's comprehensive range of Martindale testers are available with 2,5 and 9 stations, which can be equipped with kits to test abrasion and pilling on textiles, socks, leather, coated fabrics, soiling and other materials.

The required number of stations can be selected to best match the volume of testing. Though our range of available kits customers can adapt the Martindale to allow for many applications in this one versatile instrument.



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### TOUCHSCREEN

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Our designers worked closely with users and our textile technologists in our working laboratory to produce an intuitive touchscreen makes the Martindale easy to control. The different features are easy to access and navigation is quick, which ensures the set-up of a test is very simple.

As the familiar feel of a touchscreen is similar to devices used in everyday life, users become an expert instantly.

The touchscreen offers reduced training time and increased efficiency contributing to cost reductions and an enjoyable user experience.

The touchscreen is made with toughened cover glass which has been tested to replicate laboratory wear and tear conditions.

**More features of the touchscreen software can be found further in the Sales Tool Kit document.**



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### PEDIGREE & EXPERTISE

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James Heal was involved in the development of the original Martindale with Dr Martindale and WIRA in the 1940s. We have since established our position as a leading supplier, selling thousands of Martindales in the subsequent decades.

Part of our position as a trusted manufacturer comes from using the instrument ourselves in our ISO 17025 compliant in-house laboratories. Every day we test materials using the same methods as our customers, and apply this expertise to designing and manufacturing an instrument that exceeds the requirements of a laboratory setting.

We have continued this development of our flagship instrument to ensure it remains at the forefront of innovation, offering the next level of functionality and ease of use.



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## ORIGINAL TEST MATERIALS

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James Heal make original Martindale test materials/consumables, suitable and recommended for use on this family of instruments.

The SM25 cloth, developed in conjunction with the Woolmark Company and approved by major retailers, was originally produced by Godwin Associates. James Heal bought this company and maintained the exact weaving and finishing processes associated with this important reference material.

As with all our test materials, we manufacture, process, test and package in house, and all the components for these are sourced within the UK to allow for complete control over the production process.

Each product undergoes rigorous testing procedures, both in house and externally, to guarantee they are totally compliant with the relevant standards and specifications.

The Martindale range includes abrasive cloth, foam, woven felt and non-woven felt, all of which are supplied with a certificate of conformity. We hold stock of these products in countries around the world, giving our customers quick and local access to compliant, high quality test materials.



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## SERVICE & SUPPORT

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### Service

Our Service & Calibration engineers, many of whom have over 20 years field experience, possess extensive knowledge of test equipment from a range of manufacturers. They are ideally placed to ensure every part of your instrument is performing correctly. A certificate is provided within 2 days of calibration as proof of compliance for both auditors and customers.

The James Heal Martindale calibration service offers a comprehensive check into 12 different points on the instrument, ensuring it complies with strict measurements as set by UKAS. These include abrasion and pilling lissajous figures, spindle bearing friction, sample holder insert protrusion and the parallelism between the abrading table and sample holder insert.

Our engineers work in 104 countries around the world, resulting in high quality, comprehensive service and support that minimises downtime and protects your reputation.

### Support

The support structure in place for any customer who buys a James Heal instrument is extensive:

#### Applications Support

Lead by our Head of Testing who has over 30 years of practical experience in the textiles industry, our applications support answers questions on how to test on the Martindale.

#### Technical Support

An experienced team of former field engineers with a combined 20 years experience in service and calibration address any technical issues that should arise.



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## EASILY ACCESSIBLE

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The design of each instrument enables access to all stations from the front, even on the larger 9 station Martindale.

This ergonomic access makes it easy to check and change samples, an improvement on other similar instruments on the market.

The 9 station Maxi-Martindale has a hinged lid which lifts to allow full access to the tables.

The lid remains attached to the instrument which negates the need to lift and remove the lid.



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## QUICK LOCK CLAMPING RINGS

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Precision quick lock clamping rings, engineered from aerospace grade aluminium in house in the UK, twist onto each station securing test materials in place with ease. This reduces set up time for each test, increasing productivity and throughput.



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## JOG FUNCTION & VARIABLE SPEEDS

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A simple jog function allows the operator to slowly move the top plate into the most suitable position to mount the abrasive fabric, consequently the top plate does not need to be removed in between day to day tests.

Accurate testing and control over the instrument is available from the outset.

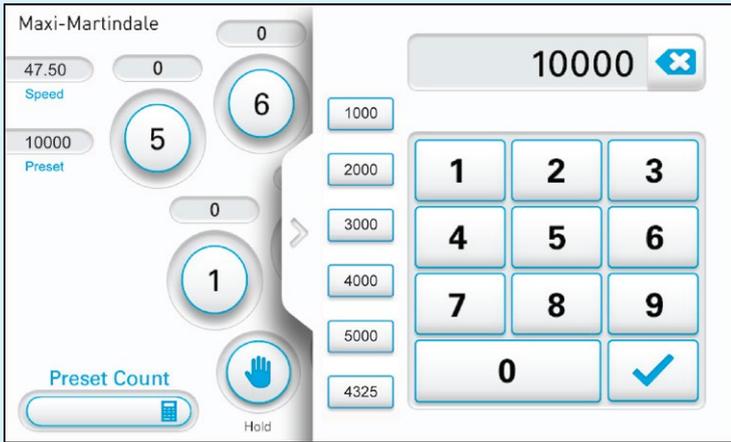
Testing can be set at variable speeds - Slow (12rpm), Normal (47.5rpm) and Fast (71.3rpm) - you can perform tests as stated in the standards or change the speed if users want to develop their own method.



# MARTINDALE TOUCHSCREEN

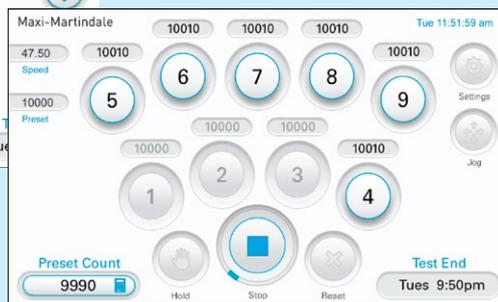
## Quick and easy to set a test

Clear, easy to use controls make setting up any test quick to do. Any user can pick up the process quickly as the screen is instinctive and intuitive, minimising training time.



## End of test visibility

The display shows the Test End time and a progress bar, which allows the user to leave the instrument to work on other tasks and return on completion, a more efficient use of their time.

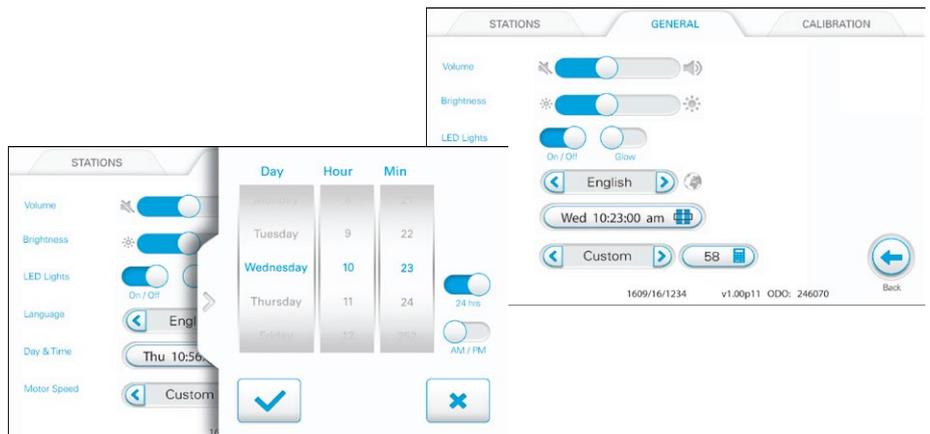


## Control over individual stations

Individual station counters and an individual hold function give the user the ultimate control over each station when testing, allowing them to use the instrument to exactly meet their testing needs.

## Easily accessible settings

Settings for brightness, volume, date, language and motor speed can all be easily accessed from the top menu bar.



# MARTINDALE TOUCHSCREEN LANGUAGES

The Martindale Touchscreen can be set in a total of 9 different languages, all of which are listed below. This further compliments how easy the Martindale is to use, enabling the user to work with a language they understand.



English



中文 / Chinese



Español / Spanish



Deutsche / German



Français / French



বাঙালি / Bangla



Italiano / Italian



हंदी / Hindi



Türk / Turkish

Changing the language is easy, simply access the settings menu on the top bar of the screen, and toggle through to select the required language.



## APPLICATIONS - TEXTILES

### What is it testing for?

Abrasion resistance, to assess the durability and wearability of textiles  
Pilling resistance, to assess wearability and appearance.

### How does it test it?

The specimen is placed in the sample holder and rubbed with a certain pressure applied - 9kPa and 12kPa - which is determined by the end use and the standard.

### Is there a main standard?

The main standard for Abrasion testing is ISO 12947 Series, which comprises of 4 parts. ASTM 4966 is the American version of this. There are lots of other standards for abrasion and pilling testing on textiles.

### Any other info?

For Adidas Abrasion testing, the insert and sample holder nut change to allow for thicker samples.

#### Instrument Only

##### 902-964 Maxi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **9 working positions**  
Order station kits, consumables and other accessories separately

##### 902-965 Midi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **5 working positions**  
Order station kits, consumables and other accessories separately

##### 902-966 Mini-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **2 working positions**  
Order station kits, consumables and other accessories separately

#### Accessories

##### Abrasion EN ISO 12947 - 1

Stock Code	Item
794-620	Abrasion Station Kit Comprising: 1 x Sample Holder 1 x 9 kPa Weight 1 x 12 kPa Weight  Recommended minimum order quantity: 1309/1305 = 4; 1302 = 2

##### Pilling EN ISO 12945 - 2

Stock Code	Item
794-517	Pilling Station Kit Comprising: 1 x Sample Holder 1 x Sample Retaining Ring 1 x Ring Weight  Recommended minimum order quantity: 1309/1305 = 3; 1302 = 2

#### Adidas Abrasion

Stock Code	Item
794-524	Adidas Abrasion Station Kit Comprising: 1 x Sample Holder with modified sample holder insert 1 x 9 kPa Weight (526-546) 1 x 12 kPa Weight (526-547)  Note: The Adidas Abrasion Station kit is compliant with Adidas GE-63 but is NOT fully compliant with ISO 12947-1 (see 794-516). Recommended minimum order quantity: 1309/1305 = 4; 1302 = 2
701-254	Silicon Carbide Abrasive Paper for Adidas GE-63 - 280 Grit - Pack 100 sheets 230 x 280 mm
701-255	Silicon Carbide Abrasive Paper for Adidas GE-63 - 400 Grit - Pack 100 sheets 230 x 280 mm



## APPLICATIONS - TEXTILES CONTINUED

Other Accessories			
Stock Code	Item	Stock Code	Item
902-221	Circular Cutter - For the rapid and accurate preparation of 140mm diameter upper and lower specimens for the pilling test	525-256	Specimen Mounting Mandrel - This is an essential accessory for mounting specimens for the pilling test
902-222	Circular Cutter For the rapid and accurate preparation of 38mm diameter test specimens	766-451	Full Set EMPA Photographic Standards This complete set consists of 3 x 4 mounted photographs for woven fabrics and 3 x 4 for knitted fabrics. The 4 photographs indicate ratings of 1-2, 2-3, 3-4 and 4-5.
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)

Stretch Fabrics - Mounting Device	
Stock Code	Item
794-512	Mounting Device  Supplied complete with 4 weights and 50 foils  All in accordance with Annex A of EN ISO 12947-2  Note : The total mass of EACH single weight piece complete with one clamp is 100g
785-507	Additional Foils - per pack (50)

Additional Parts for Renault/Peugeot/Citroen Specification (D44 1846/--A April 1994)		Additional Parts for M & S P140	
Stock Code	Item	Stock Code	Item
525-244	Weights 1.4kg - each	525-257	Weights 6kPa - for M & S P140 "Assessment of Surface  Disturbance on Fabrics containing Micro Fibres" - per set (4)
525-259	Modified Sample Holder Nuts - each  ONLY FOR SPECIMENS EQUAL TO OR THICKER THAN 5 MM - OTHERWISE STANDARD NUTS ARE ACCEPTABLE		



**794-650 Abrasion Station Kit**



**794-517 Pilling Station Kit**



## APPLICATIONS - SOCKS

### What is it testing for?

Abrasion resistance of socks, to see how quickly holes are formed on three different pressure points on a sock.

### How does it test it?

A precision ball is placed in the sample holder behind the sock to create increased pressure than a standard abrasion test, replicating a foot in a sock.

### Is there a main standard?

EN 13770 is the European standard for sock testing.

### Any other info?

The standard asks for 4 tests, which is why we recommend a minimum of 4 sock abrasion kits for the 5 and 9 station models. It would be possible to test sock abrasion on all 5 or 9 stations simultaneously.

### Instrument Only

#### 902-964 Maxi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **9 working positions**

Order station kits, consumables and other accessories separately

#### 902-965 Midi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **5 working positions**

Order station kits, consumables and other accessories separately

#### 902-966 Mini-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **2 working positions**

Order station kits, consumables and other accessories separately

### Accessories

#### Sock Testing EN 13770 - Method 1

Stock Code	Item
794-526	Sock Abrasion Station Kit Comprising: 1 x Sock Sample Holder 1 x Pinned Ring 1 x Precision Ball (Yellow)  Recommended minimum order quantity: 1309/1305 = 4; 1302 = 2
526-677	Modified Block Spanner (for Sock Testing - one per machine)
526-547	12 kPa Weight (for Sock Testing - one per kit)
201-828	ISO Certificate of Calibration for Sock Abrasion Station Kit (up to 5 kits)



794-526 Abrasion Station Kit



526-547 12kPa Weight



## APPLICATIONS - LEATHER

### What is it testing for?

Abrasion resistance of leather - not until a hole is formed, but until the surface layer of leather is broken/cracked.

### How does it test it?

A ball plate, a metal plate with ball bearings across the surface, is placed under the leather sample. The ball bearings to create pressure points, and an abrasive material is used in the sample holder to rub against the leather.

### Is there a main standard?

EN ISO 17076-2, originally developed by BMW for leather car interiors, is used for this testing.

### Any other info?

A range of spacers in the ball plate station kit makes it suitable for all generations of James Heal Martindale.

### Instrument Only

#### 902-964 Maxi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **9 working positions**  
Order station kits, consumables and other accessories separately

#### 902-965 Midi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **5 working positions**  
Order station kits, consumables and other accessories separately

#### 902-966 Mini-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **2 working positions**  
Order station kits, consumables and other accessories separately

### Testing Leather - Martindale Ball Plate Station Kit

Stock Code	Item
794-410	<p>Martindale Ball Plate Station Kit</p> <p>Based on VDA Test Method 230-211 (June 2008), EN ISO 17076-2 and IUP 48-2 (International Union of Leather Technologists and Chemists Societies - IULTCS) 'Determination of the Abrasion Resistance of Leather Surfaces using a Martindale Abrasion Tester and Ball Plate'</p> <p>The test method was developed by BMW and is suitable for use with BMW test method AA-0412.</p>
	<p>Each kit comprises:</p> <ul style="list-style-type: none"> <li>1 x Martindale Ball Plate (525-795)</li> <li>1 x Woven Felt Pad (714-610)</li> <li>1 x Template (160mm diameter) for preparation of test specimens (525-793)</li> <li>1 x Spacer (525-799) (Martindale 864)</li> <li>1 x Spacer (525-899) (Martindale 900)</li> <li>1 x Replacement Sample Holder Guide (Martindale 1300)</li> <li>1 x Operator's Guide (including VDA Test Method) (290-864-2)</li> </ul> <p>One kit is required per machine station. The kit fits all generations of James Heal Martindales (from serial number 103/1386/2) and Nu-Martindales (Models 403, 404, 406 and 864) and Mini-Martindale (Model 401).</p>
201-826	ISO Certificate of Calibration for Martindale Ball Plate



794-410 Ball Plate Station Kit



## APPLICATIONS - LEATHER - SOILING

### What is it testing for?

The transfer of soil or dye from fabric onto a leather specimen.

### How does it test it?

Leather is placed on the bottom plate, and rubbed against a soiled cloth in the pilling sample holder (which must be purchased separately). The ring weight plus the 12kPa weight are used to exert pressure.

### Is there a main standard?

ISO 26082-1 (IUP 53-1) is used for this.

### Any other info?

Soiling can also be tested on coated fabrics, using standard EN 15973.

### Instrument Only

#### 902-964 Maxi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **9 working positions**

Order station kits, consumables and other accessories separately

#### 902-965 Midi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **5 working positions**

Order station kits, consumables and other accessories separately

#### 902-966 Mini-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **2 working positions**

Order station kits, consumables and other accessories separately

### ISO 26082-1 (IUP 53-1) - Leather - Physical and mechanical test method for the determination of soiling - Part 1: Rubbing (Martindale) method

Stock Code	Item	Stock Code	Item
794-620	Abrasion Station Kit	794-517	Pilling Station Kit
526-547	Weight 12kPa (one per Pilling Station Kit required)	525-256	Specimen Mounting Mandrel (only one required) This is an essential accessory for mounting soiling cloth
714-612	Woven Felt Pads (140mm diameter) - per pack (20)	714-611	Woven Felt Pads (90mm diameter) - per pack (20)
786-256	Pre-cut Discs of Polyurethane Foam (38mm diameter) - per pack (approx. 2000)	902-221	Circular Cutter (140mm diameter)
902-222	Circular Cutter (38mm diameter)	766-200	Grey Scale for assessing Change in Colour
201-730	ISO Certificate of Calibration for Incubator/Oven (up to 60 litres) (single point - temperatures: 37°, 50° and 105°C)		



525-256 Specimen Mounting Mandrel



526-547 12kPa Weight



## APPLICATIONS - CARPETS

### What is it testing for?

The change of appearance in carpet as a result of abrasion. This test is not taken to an end point where holes appear, but instead when the carpet sample presents an undesirable appearance.

### How does it test it?

There are two ways to test carpet on the Martindale:

1. The Hexapod Stud which attaches to the top sample holder and abrades in a Lissajous pattern
2. A carpet sample holder kit which includes a 8lb weight to assert 55kPa of pressure on the specimen. The holder can accommodate a variety of abrasives and the test involves a reduced number of rubs.

### Is there a main standard?

ISO 11856 is for the Hexapod Stud, BS EN 1813 is for the carpet sample holder kit.

### Any other info?

Both methods require an abrading table for thick samples to accommodate the carpet.

### Instrument Only

#### 902-964 Maxi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **9 working positions**  
Order station kits, consumables and other accessories separately

#### 902-965 Midi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **5 working positions**  
Order station kits, consumables and other accessories separately

#### 902-966 Mini-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **2 working positions**  
Order station kits, consumables and other accessories separately

### Accessories

HexaPod (HP) Carpet Abrasion Kit		Carpet Sample Holder	
Stock Code	Item	Stock Code	
794-528	HexaPod (HP) Carpet Abrasion Kit - each Comprises: 526-690 HexaPod Holder Assembly 525-258 Spindle (with O-ring fitted) 526-547 12 kPa Weight  Complies with ISO 11856:2014	794-531	Carpet Sample Holder including 8 lb weight and guide - each  The 8 lb weight exerts a pressure of 55 kPa on the specimen  Complies with BS EN 1813

### Both require:

Stock Code	Item
526-764	Abrading Table (Thick Samples) - each. Including, Sample holder guide - carpet



794-528 HexaPod Stud Carpet Abrasion Kit



# APPLICATIONS - COATED FABRICS FOR UPHOLSTERY

## What is it testing for?

The transfer of soiling from fabric onto coated upholstery fabrics.

## How does it test it?

A coated fabric sample is placed on the bottom plate, and rubbed against a soiled cloth in the pilling sample holder. The ring weight and the 12kPa weight are used to exert pressure.

## Is there a main standard?

EN 15973 is the standard for this test.

## Any other info?

An incubator oven is included in the recommended accessories as the standard states that the user creates their own dry and aqueous soiled fabrics then dry them in an incubator before testing.

### Instrument Only

#### 902-964 Maxi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **9 working positions**

Order station kits, consumables and other accessories separately

#### 902-965 Midi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **5 working positions**

Order station kits, consumables and other accessories separately

#### 902-966 Mini-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **2 working positions**

Order station kits, consumables and other accessories separately

### Accessories

#### EN 15973 - Rubber - or plastic - coated fabrics - Upholstery fabrics - Resistance to soiling (also suitable for BMW test method AA-0419)

Stock Code	Item	Stock Code	Item
794-517	Pilling Station Kit	526-547	Weight 12kPa (one per kit required)
525-256	Specimen Mounting Mandrel (only one required) - This is an essential accessory for mounting soiling cloth	714-612	Woven Felt Pads (140mm diameter) - per pack (20)
714-611	Woven Felt Pads (90mm diameter) - per pack (20)	902-221	Circular Cutter (140mm diameter)
702-541	Cotton Lawn - per pack (1m) approx 140cm wide	766-201	Grey Scale for assessing Staining ISO 105-A03
730-420	Incubator Model HX30 - 230V 50/60Hz Fitted with air circulating fan Volume: 30 litres Temperature Range: Ambient plus 10°C - 220°C Note: Supplied without electrical connecting plug	730-422	Incubator Model HX30 - 110V 60Hz Fitted with air circulating fan Volume: 30 litres Temperature Range: Ambient plus 10°C - 180°C Note: Supplied without electrical connecting plug
201-730	ISO Certificate of Calibration for Incubator/Oven (up to 60 litres) (single point - temperatures: 37°, 50° and 105°C)		



**730-420/730-422**  
**Incubator Model HX30**



## APPLICATIONS - EDGES

### What is it testing for?

The abrasion of edges, such as collars, cuffs and those found on bags.

### How does it test it?

A line contact plate, a circular plate with a raised bar in the middle, is placed under the sample on the bottom plate, to create a raised edge. The Martindale is set to rub in a straight line, creating very localised abrasion.

### Is there a main standard?

There are no standards for this testing. Laboratories and retailers can develop their own methods test to their own internal specifications.

### Any other info?

A range of spacers in the line contact plate station kit makes it suitable for all generations of Martindale.

### Instrument Only

#### 902-964 Maxi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **9 working positions**  
Order station kits, consumables and other accessories separately

#### 902-965 Midi-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **5 working positions**  
Order station kits, consumables and other accessories separately

#### 902-966 Mini-Martindale Abrasion and Pilling Tester

85-264VAC 50/60Hz - Instrument is supplied as standard with **2 working positions**  
Order station kits, consumables and other accessories separately

### Accessories

#### Testing Edges - Martindale Line Contact Plate Kit

Stock Code	Item
794-411	<p>Used to produce multi-directional edge abrasion causing holes, hairiness and/or fibrillation.</p> <p>Kit can be used for testing shirt collars and cuffs as well as for materials used for ruck sacks and similar end uses.</p> <p>Not supplied are double-sided tape and velcro.</p> <p>Each kit comprises:-            1 x Line Contact Plate 525-691            1 x Spacer 525-799 (Martindale 864)            1 x Spacer 525-899 (Martindale 900)            1 x Replacement Sample Holder Guide (Martindale 1300)            1 x Pilling Station Kit 794-517</p> <p>One kit is required per machine station.            The kit fits all generations of James Heal Martindales (from serial number 103/1386/2), Nu-Martindales (Models 403, 404, 406 and 864) and Mini-Martindale (Model 401)</p>



**794-411 Line Contact Plate Kit**

# SPARE PARTS & SPARES KITS

## 2-year Spares Kit for 9 Station Martindale- 1609-spares - Comprising:

Stock Code	Item	Stock Code	Item
130-825	Fuse 1A (2)	130-853	Fuse 2A (2)
195-425	Voltage Surge Suppressor (1)	526-528	Sample Holder Guide (Standard) (9)
304-667	Liner Bush (3)	526-400	Drive Pin (3)
526-009	Bearing Pad (3)	383-400	480T Timing Belt (1)
383-399	560T Timing Belt (1)	786-702	Grease - per tube (50g) (1)

## Individual Spare Parts for 9 Station Martindale

Stock Code	Item	Stock Code	Item
130-825	Fuse 1A	130-853	Fuse 2A
195-425	Voltage Surge Suppressor	526-528	Sample Holder Guide (Standard)
525-258	Spindle only - each	304-667	Liner Bush
526-400	Drive Pin	526-009	Bearing Pad
383-400	480T Timing Belt	383-399	560T Timing Belt
786-702	Grease - per tube (50g)		

## 2-year Spares Kit for 5 Station Martindale- 1605-spares - Comprising:

Stock Code	Item	Stock Code	Item
130-825	Fuse 1A (2)	130-853	Fuse 2A (2)
195-425	Voltage Surge Suppressor (1)	526-528	Sample Holder Guide (Standard) (5)
304-667	Liner Bush (3)	526-400	Drive Pin (3)
526-009	Bearing Pad (3)	383-400	480T Timing Belt (1)
786-702	Grease - per tube (50g) (1)		

## Individual Spare Parts for 5 Station Martindale

Stock Code	Item	Stock Code	Item
130-825	Fuse 1A	130-853	Fuse 2A
195-425	Voltage Surge Suppressor	526-528	Sample Holder Guide (Standard)
525-258	Spindle only - each	304-667	Liner Bush
526-400	Drive Pin	526-009	Bearing Pad
383-400	480T Timing Belt	786-702	Grease - per tube (50g)

## 2-year Spares Kit for 2 Station Martindale- 1302-spares - Comprising:

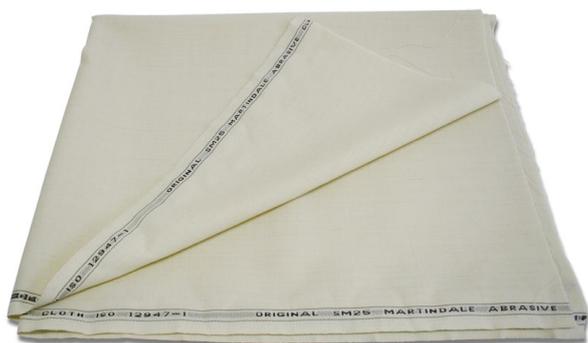
Stock Code	Item	Stock Code	Item
130-825	Fuse 1A (2)	130-853	Fuse 2A (2)
195-425	Voltage Surge Suppressor (1)	526-528	Sample Holder Guide (Standard) (2)
304-667	Liner Bush (3)	526-400	Drive Pin (3)
526-009	Bearing Pad (3)	383-400	480T Timing Belt (1)
786-702	Grease - per tube (50g) (1)		

## Individual Spare Parts for 5 Station Martindale

Stock Code	Item	Stock Code	Item
130-825	Fuse 1A	130-853	Fuse 2A
195-425	Voltage Surge Suppressor	526-528	Sample Holder Guide (Standard)
525-258	Spindle only - each	304-667	Liner Bush
526-400	Drive Pin	526-009	Bearing Pad
383-400	480T Timing Belt	786-702	Grease - per tube (50g)

# TEST MATERIALS

Consumables/Test Materials - Abrasion			
Stock Code	Item	Stock Code	Item
701-202	Martindale Abrasive Cloth SM25 - per pack (5 metres)	701-207	Pre-cut Discs of Martindale Original Abrasive Cloth SM25 (140mm diameter) - per pack (100)
701-200	Martindale Abrasive Cloth SM25 - per roll (25 metres)	701-203	Martindale Abrasive Cloth SM25 - per roll (50 metres)
714-602	Nonwoven Felt Pads (140 mm diameter) - per pack (20)	714-612	Woven Felt Pads (140 mm diameter) - per pack (20)
714-604	Nonwoven Felt - per pack (3 pieces, each approx.1.8m x 0.3m)	714-616	Woven Felt - per pack (1 m x 1.4 m wide)
Nonwoven Felt - BS 5690 : 1988 750 ± 50 g/m2 - 3 ± 0.5 mm thick The nonwoven felt is suitable for M & S Test Methods		Woven Felt - EN ISO 12947-1:1999 750 ± 50 g/m2 - 2.5 ± 0.5 mm thick	
786-255	Foam - per pack (50 sheets - each sheet approx. 375 x 250 mm)	786-256	Pre-cut Discs of Foam (38mm diameter) - per pack (approx. 2000)



**701-202 Martindale Abrasive Cloth SM25**



**701-207 Pre-Cut Discs of Martindale Abrasive Cloth SM25**



**714-612 Woven Felt Pads (140 mm diameter)**

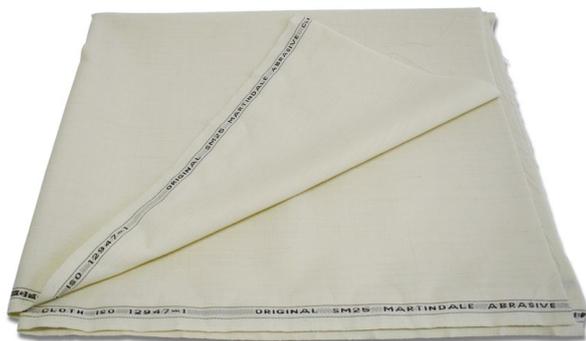


**786-256 Pre-cut Discs of Foam (38mm diameter)**

# TEST MATERIALS

## Consumables/Test Materials - Pilling

Stock Code	Item	Stock Code	Item
714-602	Nonwoven Felt Pads (140 mm diameter) - per pack (20)	714-612	Woven Felt Pads (140 mm diameter) - per pack (20)
714-601	Nonwoven Felt Pads (90 mm diameter) - per pack (20)	714-611	Woven Felt Pads (90 mm diameter) - per pack (20)
356-301	Sample Retaining Rings - per pack (10)		



**701-202 Martindale Abrasive Cloth SM25**



**714-601 Nonwoven Flet Pads (- diameter)**

## Consumables/Test Materials - Sock Testing

Stock Code	Item	Stock Code	Item
393-254	Spare Precision Ball (Black) - per pack (2)	393-256	Spare Precision Ball (Yellow) - per pack (2) 393-256 is only suitable for Sock Abrasion Station Kits where the inside of the Sample Holder is marked "YELLOW BALL" Otherwise use the black ball.
525-300	Spare Pinned Ring	701-202	Martindale Abrasive Cloth SM25 - per pack (5m)
714-612	Woven Felt Pads (140mm diameter) - per pack (20)		

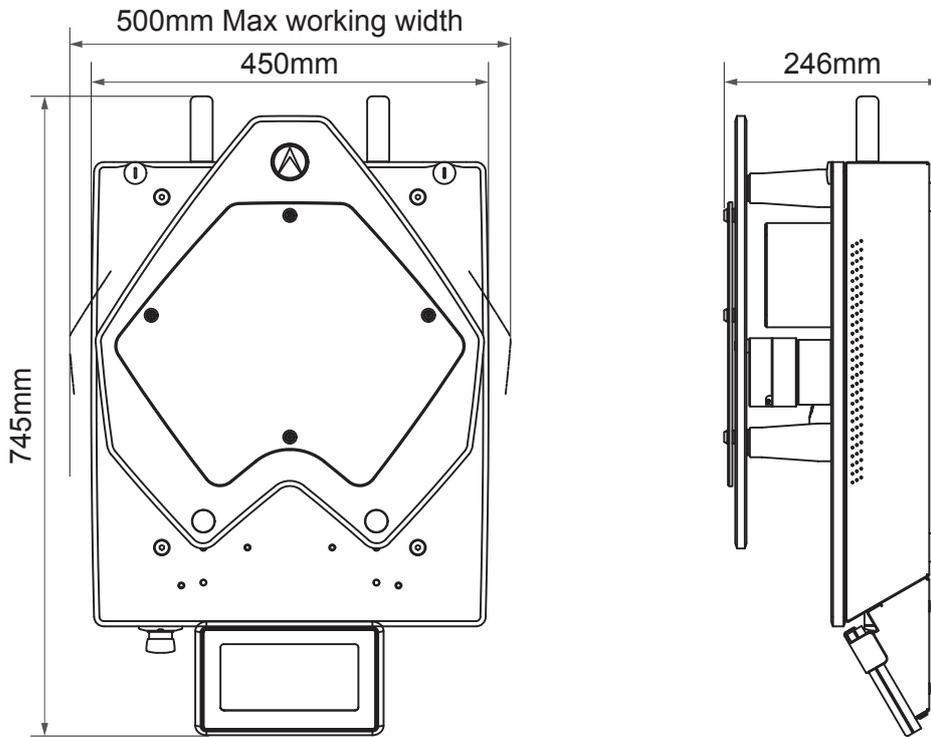
## Consumables/Test Materials - Ball Plate

Stock Code	Item	Stock Code	Item
714-612	Woven Felt Pads (140 mm diameter) - per pack (20)	786-256	Pre-cut Discs of Foam (38mm diameter) - per pack (approx. 2000)

# DIMENSIONS & WEIGHT

Dimensions (mm)	Height	Width	Working Width	Depth	Weight (kg)
Martindale 1602	246*	450	500	745	45.0

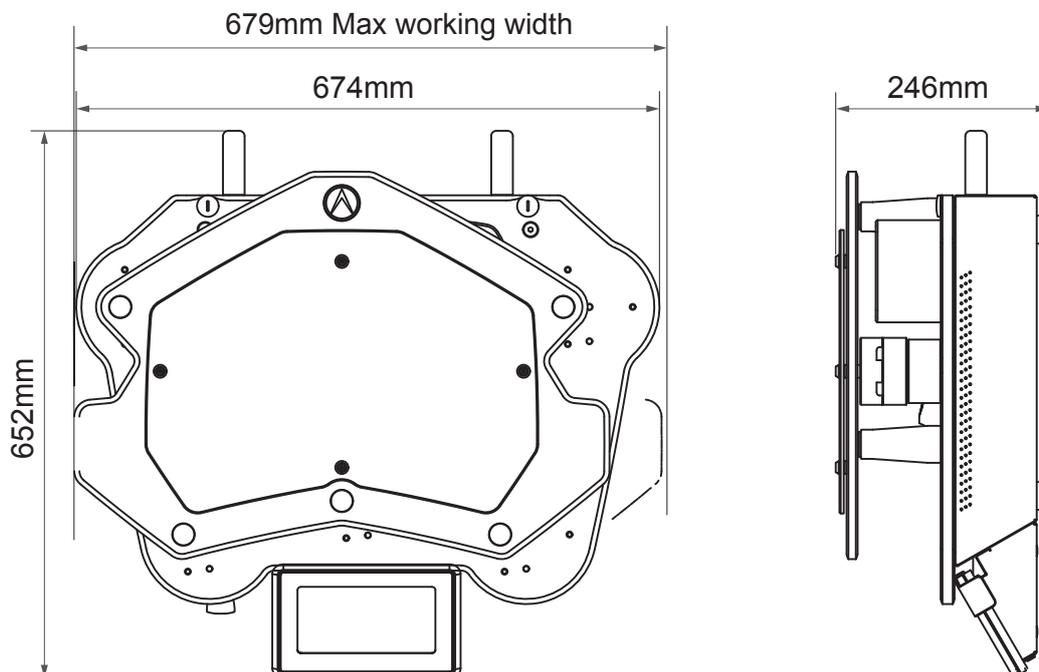
Please note the working width when allocating space for this instrument



\*Excludes spindles

Dimensions (mm)	Height	Width	Working Width	Depth	Weight (kg)
Martindale 1605	246*	674	679	652	65.0

Please note the working width when allocating space for this instrument

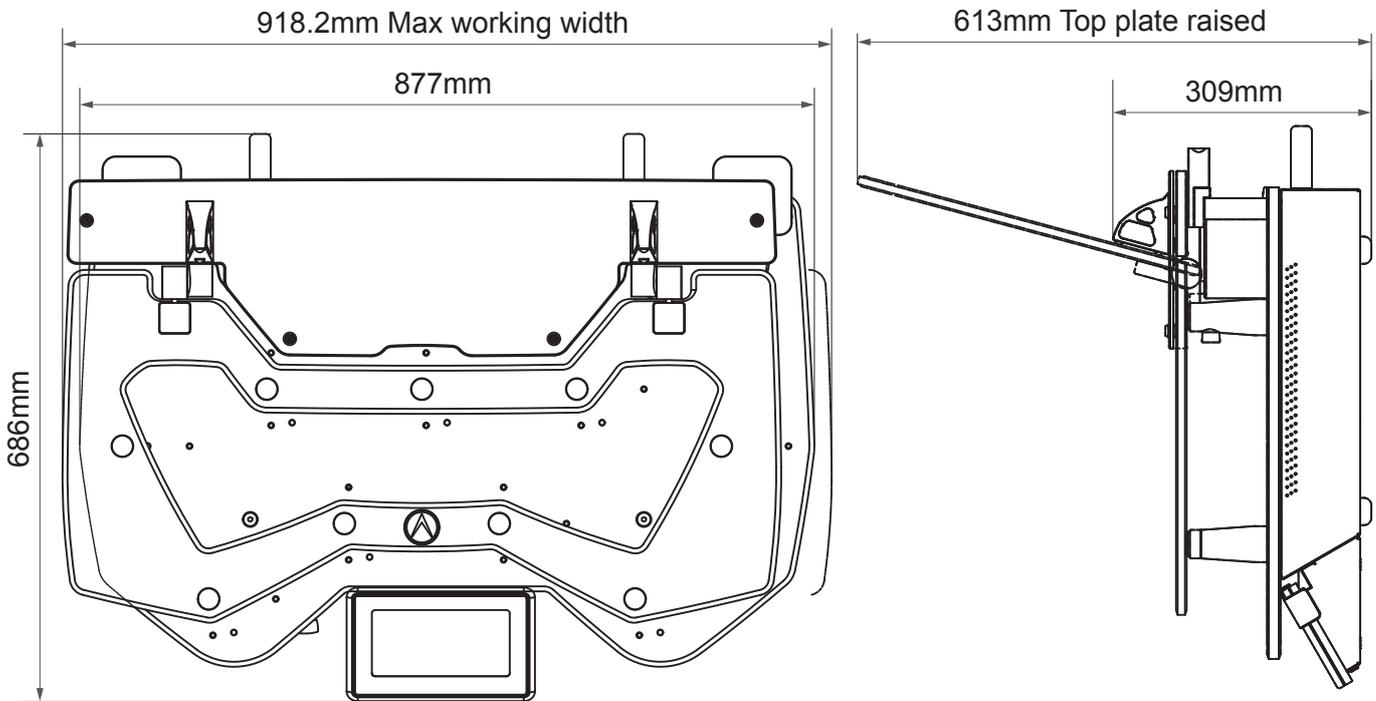


\*Excludes spindles

# DIMENSIONS & WEIGHT

Dimensions (mm)	Height	Working Height	Width	Working Width	Depth	Weight (kg)
Martindale 1609	309*	613	877	918.2	686	85.0

Please note the working width and height when allocating space for this instrument



\*Excludes spindles

# INSTALLATION GUIDE

Item	Comment
Electricity	110 to 230V AC 50/60Hz Single Phase 0.5 / 1 A 60 W *
Air	Not required
Bench or Floor Standing	Bench
Water Supply	Not required
Drainage	Not required
Air Extraction	Not required
Conditioning	It is recommended the instrument is located within a conditioned atmosphere.

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

CE Conformity: Martindale is CE marked and is therefore compliant with the following directives:

- Machinery Directive 2006/42/EC
- Low Voltage Directive 2006/95/EC
- EMC Directive 2004/108/EC
- WEEE Directive 2002/96/EC
- RoHS Directive 2002/95/EC