



OPERATOR'S GUIDE

Sock Abrasion Kit

Abrasion Resistance for Hosiery
Modified Martindale Method
According to EN 13770 - Method 1

Published by:

JAMES H. HEAL & CO. LTD.
RICHMOND WORKS
HALIFAX
WEST YORKSHIRE HX3 6EP
ENGLAND

TELEPHONE +44 (0) 1422 366355

FACSIMILE +44 (0) 1422 352440

E-mail info@james-heal.co.uk

Internet <http://www.james-heal.co.uk>

INTRODUCTION

Purpose

The *Sock Abrasion Kits* are used in conjunction with Martindale instruments (Models 103, 403, 404, 406, 864, 900, 1300 or 1600 series) for the determination of the abrasion resistance in the stretched state, of hosiery manufactured from all fibre combinations, designs and for all end-uses.

Illustrations for this guide were created with an earlier model, however the test and apparatus still apply to more recent models.



Maxi-Martindale 909



Midi-Martindale 905

Standards

- EN 13770 - Method 1

Scope

Circular specimens of the hosiery are selected, stretched over a flattened rubber surface and abraded against a reference abradant under a known pressure with a cyclic planar motion in the form of a lissajous figure, which is the resultant of two simple harmonic motions at right angles to each other. The resistance to abrasion is estimated by the number of cycles to either total breakdown or thinning of one component.

Atmosphere for Conditioning and Testing

The conditioning and testing atmosphere shall be the standard temperate atmosphere for testing textiles as defined in ISO 139, i.e., relative humidity of $65 \pm 4\%$ and temperature of $20 \pm 2^\circ\text{C}$.

INSTALLATION

Unpacking

Take care when handling the pinned rings - they are extremely sharp!

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 immediately.

Check List

Quantity	Description	Stock Code
1	Sock Abrasion Kit Comprising: 1 Sock Sample Holder 1 Pinned Ring 1 Precision Rubber Ball (Yellow)	794-526
1	Essential Accessory Block Spanner Note: Only 1 per Martindale instrument required	526-677
	Optional Accessories	
	12kPa Weight (one per sock abrasion kit)	526-547
	Circular Cutter (38mm diameter)	902-222
	Circular Cutter (140mm diameter)	902-221
	ISO Certificate of Calibration for Sock Abrasion Station Kit (up to 5 kits)	201-828
	ISO Certificate of Calibration for Sock Abrasion Station Kit (up to 9 kits)	201-920
	Test Materials (Consumables) & Spares	
	Spare Pinned Ring (each)	525-300
	Spare Precision Ball (Black) - per pack (2)	393-254
	Spare Precision Ball (Yellow) - per pack (2)	393-256
	Pack (5 metres) Abrasive Cloth	701-202
	Pack (20) Woven Felt Pads (140mm diameter)	714-612
	Grey Scale for Assessing Change in Colour	766-200

OPERATION

Preparation of Specimens

The specimens must be preconditioned in a Standard Atmosphere for 24 hours before testing.

Cut the sock so that the sole and heel are flat and free from tension.

Cut specimens 38 mm diameter from the required areas, for example, heel and sole, preferably with a cutting die or circular cutter.

Place a cut specimen face down onto the cutting board supplied.

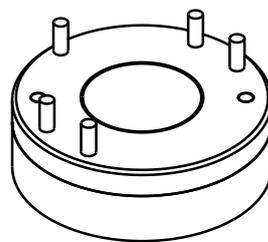
Place the pinned ring centrally over the specimen and press the ring down, securing the specimen on the pins.

Place the specimen block spanner adapter (see figure below) over the existing block spanner on the Martindale case.

Place the specimen holder nut in the specimen block spanner adapter.

Place the pinned ring with the specimen attached into the specimen holder nut, locating the pins in the matching holes in the rim of the nut.

Place a precision rubber ball at the back of the specimen with the larger diameter ($\text{Ø}20 \text{ mm}$) flat in contact with the specimen.



Locate the specimen holder body onto the specimen holder nut and press down the body until the threads engage. Screw the body onto the nut carefully and firmly to secure the specimen. Do not use excessive force, which may damage the rubber ball, or push it through the nut. Ensure the flat on the ball and thus the samples are horizontal to prevent edge wear.

Repeat the procedure for the remaining specimens.

Procedure

Also see the next page for The Sock Abrasion Test in pictures.

Select the standard 60.5 mm lissajous motion.

Place a 140 mm diameter piece of woven felt on top of and central to each abrading table. This felt need not be renewed until soiled or damaged.

Place a piece of standard abradant cloth 140 mm diameter over and central to each piece of felt. Put the abrading table weight on top of the abrasive cloth, taking care to smooth out any wrinkles. Drop the clamp ring over the weight and lock it firmly in position. Throughout this entire operation, make sure that the felt and abrasive material are free of creases and folds, and that they are held tightly in position over the top of the tables.

The standard abrasive cloth should be replaced at the start of each test and after 50,000 rubs if a test is continued beyond this point.

Remove the abrading table pressing weight.

Place the specimen holders, complete with specimen onto their respective abrading tables. Introduce the specimen holder guide spindles and apply the 12 kPa “weights” to each spindle.

Note: the actual pressure on the specimen is nominally 23.86 kPa.

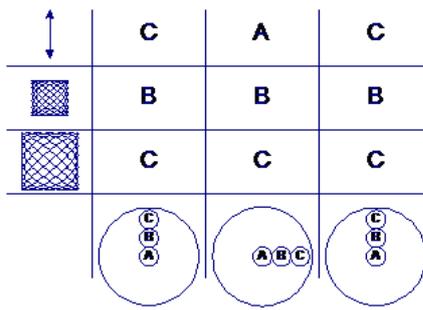
Set the pre-settable counter for the required number of cycles (refer to the table below for recommended inspection intervals).

Start the machine.

Recommended Test Cycle Inspection Intervals	
Estimated Number of Cycles to End Point	Inspection Intervals
up to 10,000	1,000
between 10,000 and 15,000	2,000
between 15,000 and 30,000	5,000
greater than 30,000	10,000

When endpoint is approaching, it is recommended that the inspection interval is decreased and determined through experience of the operator.

The Sock Abrasion Test in Pictures



Set the motion to abrasion by setting all three (3) the drive pegs in position C, large lissajous.



Abrading Table Preparation:

Remove the top plate or use the jog key to provide easy access to the abrading table.

Remove any material such as yarn or fibrous debris from the abrading table.



Place a 140mm diameter piece of felt centrally on the abrading table.

The felt need only be replaced when damaged or excessively soiled.



Place a 140mm diameter piece of SM25 abrasive cloth, face up, and centrally on the felt.

If the SM25 abrasive cloth is creased it should not be used.

The SM25 abrasive cloth is replaced after each test.



Carefully place the pressing weight centrally on to the SM25 abrasive cloth, taking care not to move felt and SM25 abrasive cloth.



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

Check the edge of the abrasive cloth is retained by the clamp ring. If the edge protrudes, reposition the felts and abrasive cloth centrally before re-clamping.

Remove the pressing weight.

Specimen Holder Preparation:

Place the block spanner adaptor on to the fixed block spanner.

This is a spring loaded device.



Place the modified sample holder nut on to the block spanner adaptor.



Place the 38mm diameter specimen, face down, centrally into the modified sample holder nut.

Creased or damaged specimens should not be used.

Avoid excessive handling of the specimen.

Place the pinned ring, needles first, down through the specimen into the holes in the modified sample holder nut.

PU Foam is not used.





Place the hard rubber precision ball with the 20mm diameter end making contact with the specimen.



Place the sample holder body on to the sample holder nut and carefully engage the screw threads.

With the screw threads engaged, apply a slight down ward force while at the same turning the sample holder body in the clockwise direction until tight.

Check the specimen is securely held.

Note how the specimen protrudes out of the sample holder nut.



Mounted sample holder, complete with spindle and loading weight.

Typically only the loading weight marked '12 kPa' is used. This gives an actual pressure on the specimen of 23.86 kPa.

Test four (4) specimens.

Assessment Intervals

Without removing the specimen from the holder, inspect at the desired intervals until an end point is reached, either a hole or an unacceptable level of thinning.

Note: a hole usually develops when one thread is broken. Thinning often occurs when soft and hard fibre combinations are present in the yarns constituting the knitted structure i.e., cotton/nylon.

Pilling

Little pilling occurs on sock specimens when in the stretched state, however, if pilling does occur, remove the pills with sharp curved bladed scissors.

Change in Colour

If required, change in colour can be determined using the grey scale specified in ISO 105-A02.

Test Report

Report the following:

- The individual values of number of cycles to endpoint
- State if the endpoint was hole formation, or thinning, or both
- The average value of cycles for the sample
- The pressure applied
- If pilling occurred and if pills were removed
- If required, colour change
- If it was necessary to change the abrasant and at what number of cycles

MAINTENANCE

- Keep the parts clean
- Do not store the pinned ring with the pins exposed
- No further maintenance is necessary

Servicing and calibration of Martindale instruments to UKAS standards is available Worldwide - Contact our **Service & Calibration** Department for further details.

Service & Calibration is a totally comprehensive, worldwide support programme. When you buy instrumentation from us, it is the beginning rather than the end of an association. Our aim is simple : 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 machine e.g. 909/11/1001. However, individual Sock Abrasion Kits are not uniquely identified with a serial number.

Contact us through our web site:

<http://www.james-heal.co.uk>

REVISION HISTORY

See front cover for publication number, e.g., 290-1666-1\$A

Revision	Date	Author	Details Of Revision
A	08.01.2007	MK	Original
B	12.06.2011		-
C	18.12.2013		-
D	30.08.2017	CB	Unpacking checklist Newer models