



OPERATOR'S GUIDE

Impulse

Random Tumble Pilling Tester

New Touchscreen User Interface

Intuitive and easy to use

Increased Capacity

4 chamber instrument now available

Covering Serial Numbers

1666-2/16/1001

1666-4/16/1001

& upwards

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JAMES HEAL

Thank you for investing in a James Heal instrument. 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 both 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

INTRODUCTION

Impulse Random Tumble Pilling Tester

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

The amount of pilling that develops is governed by the rate of fibre entanglement, the rate of surface fibre development and the rate that fibre and pills wear-off.

These rates depend on the fibre, yarn and fabric properties.

Many pilling tests now include assessment of fabric fuzzing, which can be a precursor to pill formation.

Impulse Random Tumble Pilling Tester has been designed with James Heal's unique product signature and has been produced with the user completely in mind. We have combined James Heal's technical and performance expertise, with intuitive design and operation to produce the most ergonomic and user friendly instrument. Extensive work has been done to significantly reduce the frequency of, if not eliminate, samples dropping to the bottom of the test chambers which invalidates the test. This gives the operator greater confidence in the test results. Impulse is available in a two or four chamber version to meet the needs of the individual. Impulse features our new touchscreen user interface, displaying current test conditions and providing easy access to settings.

Key Features

- Sleek, ergonomic design
- New touchscreen user interface for incredible ease of use
- Pre-set counter for running in of new Neoprene liners (ISO 12945-3)
- Interchangeable impellers, complying with 8 standards
- Lint collection filter
- New test finish time display

Standards

Impulse is compliant with the following standards:

- ASTM D3512
- JIS L 1076 Method D
- NF G 07-121
- NF G 07-132
- EN ISO 12945-3
- DIN 53867
- SANS 6116
- GB/T 4802.4

HEALTH & SAFETY

- Please read this manual carefully before operating the instrument.
- Impulse complies with the [EU regulations](#) in full.
- The 2 chamber Impulse has a mass of approximately 30kg. The 4 chamber Impulse has a mass of approximately 46kg, therefore assistance from a colleague or suitable lifting apparatus is recommended.
- Ensure all test chambers are secure before commencing a test.
- Never run the instrument without covers. Covers should only be removed by a qualified engineer or electrician when the instrument is isolated from the electrical supply.
- Have the instrument serviced and calibrated at least once a year by a James Heal service and calibration engineer.
- Impulse utilises compressed air. Compressed air is potentially dangerous if misused. Never apply compressed air to the surface of the human body.
- Never use Impulse for anything other than what it is designed for.

FIRST TIME INSTALLATION

UNPACKING

- These instruments are heavy and should be moved with care.
- Impulse is delivered on a wooden pallet. Use a forklift truck or hydraulic pump trolley to move the packing case as near as possible to the final location.
- Remove the tape from the packing case lid and open the lid.
- Carefully remove the packaging and contents from the packing case. Note that any accessories ordered with the instrument are packed with the instrument.
- Remove the sleeve.
- The instrument can now be lifted from the pallet and in to location using a pump truck if available, or by hand. If lifting by hand a minimum of 4 people will be required to very carefully lift the instrument and place it on a firm flat surface.
- Do not dispose of any packaging material until all standard and optional accessories ordered are fully accounted for. If there are any discrepancies please contact your supplier immediately.

Unpacking Checklist

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

Check the items listed in the tables below are present:

Item number	Item name	Quantity
906-506*	Impulse Random Tumble Pilling Tester (4 station)*	1
906-507*	Impulse Random Tumble Pilling Tester (2 station)*	1
297-038	Impulse CD Operators guide	1
142-304	Mains Lead Set Straight	1
794-819	Pneumatic Adaptor	1
789-368	Spatula	1
785-116	Specimen Edge Glue	1
772-285	Specimen Template 105 mm x 105 mm	1
785-509	Grey Cotton Sliver	1
794-637	Lint Collection Filter	2/4
	Ensure the requested instrument is present	

INSTALLATION

Electrical

- Stand the instrument on a firm and level surface.
- Connect the electrical power supply to the mains input using the lead provided.
- The power rating for 2 chambered Impulse is 110W and 140W for 4 chambered Impulse.

Fuses

Two (2) fuses are fitted in the instrument and are located at the rear of the instrument beneath the mains lead socket.

To replace a fuse, isolate from the mains supply, place a screwdriver blade in the slot of the fuse holder, then press and turn anti-clockwise approximately $\frac{1}{4}$ of a turn. The fuse holder complete with fuse is now released.

Compressed Air

- If air injection is to be used with the instrument, connect the air supply to the compressed air input socket on the rear of the instrument (see picture below).



- Impulse requires a pressure of 2 - 8 bar.
- Impulse has an air consumption of 84 l/min.
- A pneumatic connection of 6mm diameter and an adaptor are supplied to convert 6mm to ¼ inch BSP (female) or ¼ inch NPT (male) for the 2 chamber version. A pneumatic connection of 8mm diameter and an adapter supplied to convert 8mm to ¼ inch BSP (female) or ¼ inch NPT (male) for the 4 chamber version.
- The air supply should be capable of delivering air filtered to 5 microns or better.
- Oil lubrication of the factory air supply is not required nor recommended.
- Impulse is supplied with a 1m length of 6mm nylon hose for connection to a suitable air supply.
- Ensure all equipment used for connection, including pipes and fittings have a safe working pressure greater than that of supply.

WARNING - do not attempt to disconnect any pneumatic pipe without first expelling the excess air from the instrument. To do this, shut off the air supply to the instrument and run with Auto Air on, until all the air has been expelled.

- When removing the pipe fully depress the locking ring on the pneumatic fitting, towards the instrument while simultaneously withdrawing the pipe.
DO NOT FORCE THE PIPE.

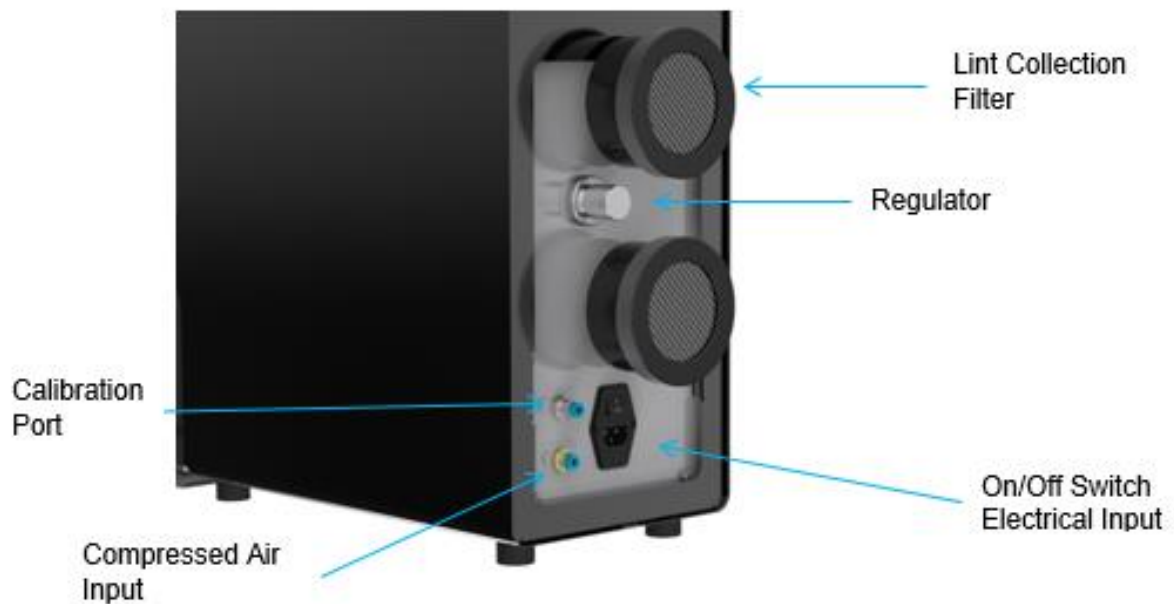
THE ESSENTIAL FEATURES OF IMPULSE



← Touchscreen

← Door Latch

Technical Features



← Lint Collection Filter

← Regulator

← Calibration Port

← Compressed Air Input

← On/Off Switch
Electrical Input

Interchangeable Impellers



Impellers can be changed quickly and easily using the ball point screwdriver provided with each impeller.



Standard Accessories

The items below make up the standard accessories kit supplied with each model of Impulse. Please note the correct adapter will be supplied for either the 2 or 4 chamber version. Each of the items in this section can also be ordered individually by quoting the relevant stock code.

Specimen Edge
Glue 785-116



Grey Cotton Sliver
785-509



Specimen Template
772-285



Spatula
789-368

Pneumatic
Adapter

Cork Liners 393-527



ACCESSORIES & IMPELLERS

Impulse is available in models with 2 or 4 test chambers and is supplied WITHOUT impellers. Ensure the required Impellers are selected separately.

Instrument		
Model No.	Stock code	Model
1666-4	906-506	4 Chamber Impulse Random Tumble Pilling Tester
1666-2	906-507	2 Chamber Impulse Random Tumble Pilling Tester

Standard Accessories included with both models of Impulse

Stock Code	Item	Stock Code	Item
785-509	Grey Cotton Sliver - Pack (approx.1 m)	789-368	Spatula
393-527*	Cork Liner - Pack (50)	772-285	Specimen Template 105 mm x 105 mm
785-116	Specimen Edge Glue - Bottle (180 ml)		

Standard Accessories for specific Impulse model as stated below

Stock Code	Item	2 Chamber 1666-2	Stock Code	Item	4 Chamber 1666-4
794-819	Pneumatic Adapter 6mm diameter to 1/4 inch BSP		794-907	Pneumatic Adapter 8mm diameter to 1/4 inch BSP	

These accessories can also be ordered individually by quoting the relevant stockcode

* Cork Liner 393-527 is suitable for Impulse and machines made by Atlas
The dimensions of the Liner are: 457±2mm long x 146 mm wide

Impellers

Stock Code	Item	
794-650	ASTM	Complies with ASTM D3512, adidas 4.07, GB/T 4802.4, ISO 12945-3, JIS L1076, NFG 07-132 & SANS 6116
794-652	ISO	Complies with ISO 12945-3 and NF G 07-121
794-656	JIS	Complies with JIS L 1076 method D

DIN impeller - available on special request -Complies with DIN 53867

Accessories

Stock Code	Item
758-566	Neoprene Liner for EN ISO 12945-3 and NF G07-121 - per pack (5).
766-450	ASTM D 3512 Photographic Standards Consists of 5 photographs, 105 mm square, graded no.1 (very severe pilling) to no. 5 (no pilling)
393-533^	Cork Liner (Extra Long) - per pack (50) - Length 460 mm ± 1 mm

^ For non-James Heal machines for which a slightly longer liner is required

SPARE PARTS

1666-2/1666-4 spares		2 year Spare Kits for either model		Comprising of	
Stock Code	Item	Stock Code	Item		
390-270	1 x Air Filter	144-403	2 x LED Spotlight Assembly		
195-348	3 x VOLTAGE SURGE SUPPRESSOR	383-363	1 x Timing Belt 278F0057 OBS		
130-825	1 x Fuse 1A 5 X 20mm T	394-786	1 x Door Gasket		
130-870	1 x FUSE, ANTISURGE, 6.3A				
390-289	1 x 3/2 Solenoid Valve 1/8" Port 1Mpa c/w foot bracket fitted				

GETTING STARTED

Lining Test Chambers

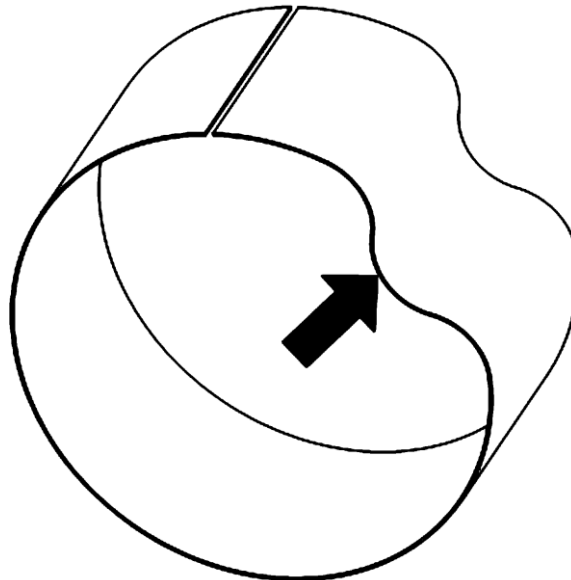
Select either the cork or neoprene liner as specified by your chosen test method.

Roll the liner into an overlapping tube and insert into the chamber.

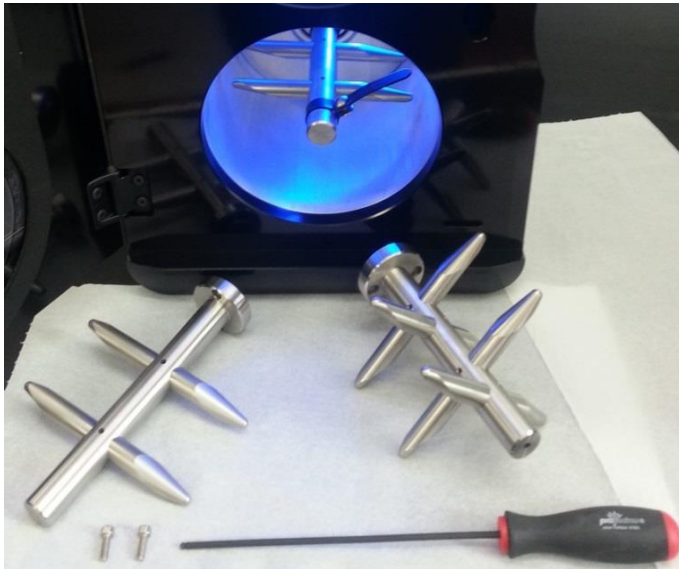
Insert finger between the liner and the test chamber and push the liner inwards to make a dent as shown in the diagram below.

Butt the short edges of the liner up to each other as shown in the diagram below.

Apply even pressure around the liner to secure it flat against the chamber walls.



Changing the Impellers



Before changing the impellers, isolate the instrument from the electrical power supply.

Removing the Existing Impeller



Using the ball point screwdriver provided with the impellers, remove the two (2) screws from the connecting flange.

Clean the connecting flanges of the impeller and test chamber using a soft, clean, lint free cloth.



Fitting an Alternative Impeller



Place the two (2) screws through the holes in the connecting flange of the Impeller.

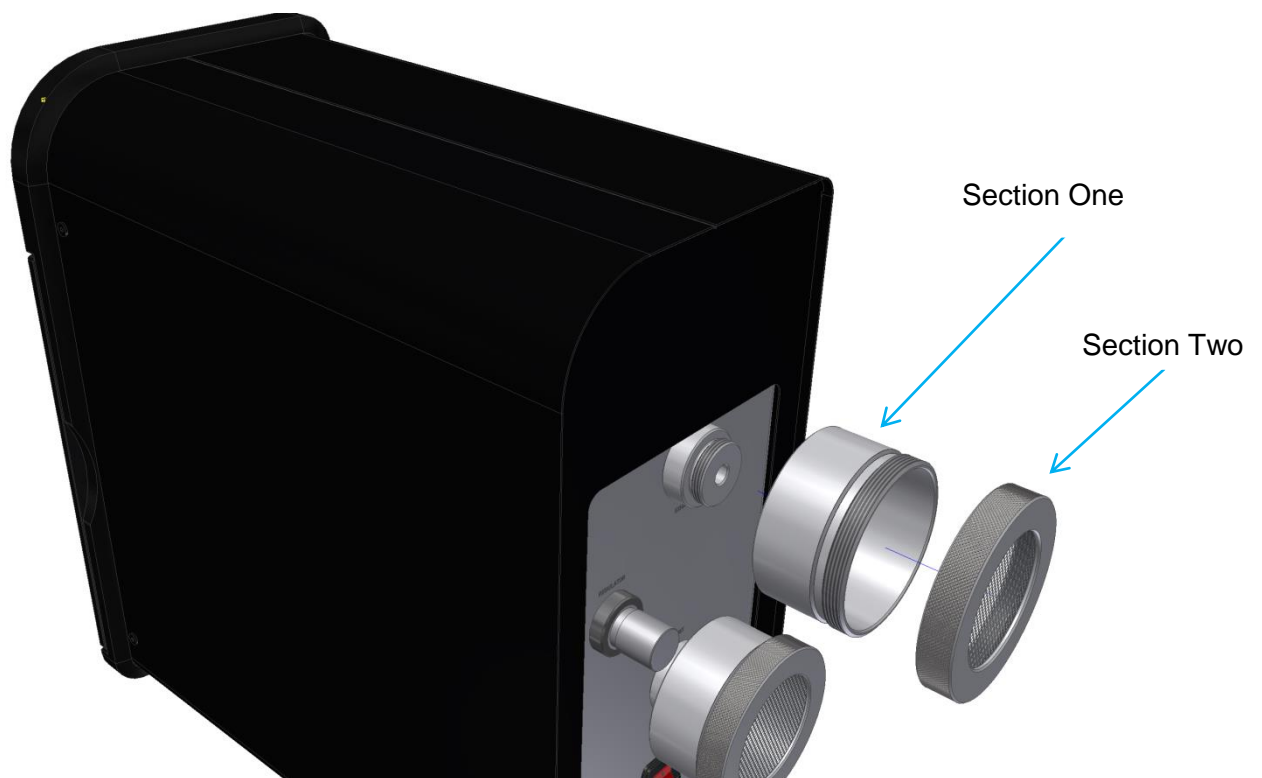
Locate the screws over the holes in the rear of the test chamber and screw each one loosely at the start.

Then alternately tighten each screw a little at a time (gradually) until both are tight.

Before fitting the liner (neoprene or cork) to the test chamber, start the impeller for a few moments to ensure it runs smoothly and without vibration.

If vibration occurs, slacken (untighten) the screws and tighten them again tightening each gradually and alternately. Do not apply any oil or grease to the screws.

Cleaning the Lint Filters



Impulse features a lint collection filter (794-637) which is located on the exhaust at the rear of the instrument.

To clean the filter, simply un-screw section one from the instrument then un-screw section two & empty the lint over a dustbin.

INTUITIVE TOUCHSCREEN USER INTERFACE

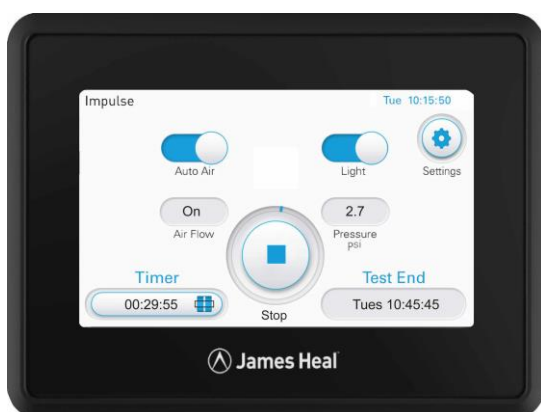
The 1666 series Impulse features the NEW intuitive touchscreen user interface.

The touchscreen brings new levels of ease of use and functionality.

Elegantly designed, the touchscreen will reduce training times and can be used by all levels of operator.

Amongst its many features are:

- Fast, easy editing of test length.
- LED light control for operator preference.
- Test end time display allowing efficient planning.
- Neoprene liner run-in setting.
- Display of current air pressure.
- IP4X rated.
- A range of language options.



The touchscreen allows the user to control all aspects of the test in a simple and intuitive way.

Using the Touchscreen



Home page

To set the timer press the (timer) button which will pull out the scroll set tab.



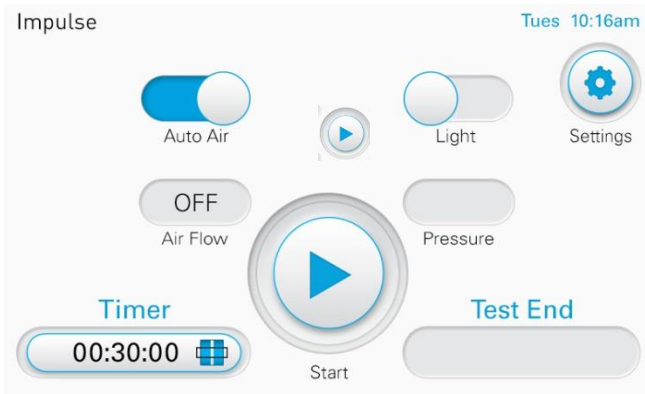
Timer

Set the required time and then press the button. To run in new neoprene liners press on the “New liners” button, which will set the timer for 3 hours.



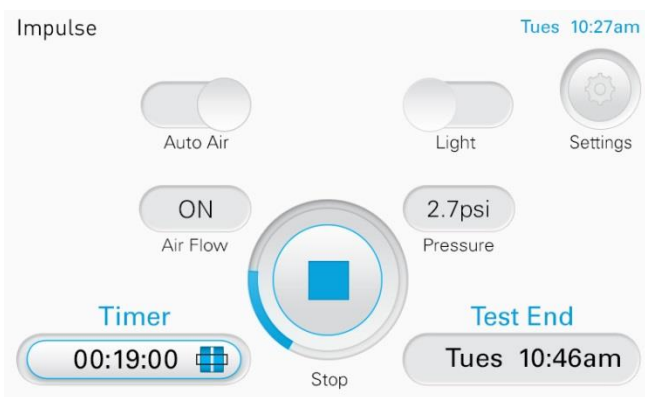
Toggle Switches

To set the “Auto Air” on and put the light on inside the chambers, toggle the switch on by sliding to the right. If the toggle switch is displaying blue the switch is on.



Test set up

Once the test has been set up, start the test by pressing the **Start** button.





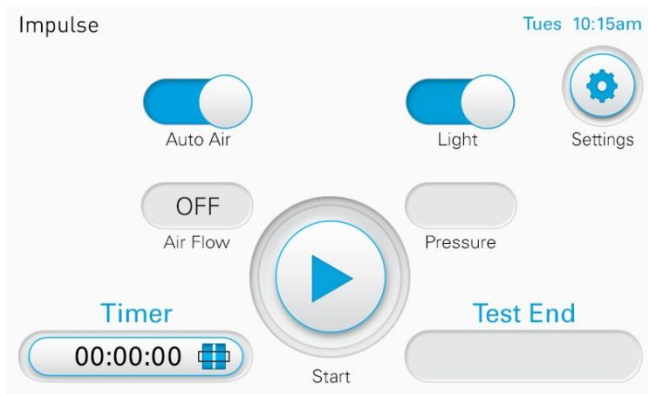
Test in progress - whilst the test is running:

- The test end display will show when the test will be complete.
- The timer will count down and the progress ring shows the progress on the test.
- The buttons and toggle switches grey out with the exception of the light which can be turned on or off throughout the test.



Test End - When the test is complete:

- The Test End display will show that the test has finished 
- The timer will display 
- The buttons and toggle switches are active again.
- The progress ring will be complete.



Settings screen

The settings screen is accessed by pressing the settings button on the top right of the home page.

It allows quick and easy alterations to:

- Volume
- Screen brightness
- Language
- Date and time
- Air pressure units
- Auto restart function -

USEFUL HINTS AND TIPS

It is common for the cork liners to rotate as the test is in progress. To prevent this it is acceptable to tape the outside edge of the liner to the chamber wall at the butt joint with a short piece of 25mm wide masking tape.

If using cotton sliver during a test, pull the piece apart gently and scatter evenly around the chamber and samples. If the sliver is put in as one large piece there is a possibility it may lodge in the lint filter, especially when air is used for the test.

Impulse has been programmed so that the air flow is delayed for a few seconds after the impellers begin to turn. Although the toggle switch will show as air on, the air flow display will show as off until the air flow begins.

This is to keep the lint in the test chamber and prevent it from lodging in the lint filter.

Impulse has an air regulator located at the back of the instrument. This can be turned to adjust the air pressure within the chambers.

If the language setting is changed the instrument should be turned off and on again to allow it to complete a power cycle before further testing is carried out. A warning message will appear on the screen to alert the operator. Overriding this instruction may cause the touchscreen to become scrambled. It can be rectified by allowing the instrument to complete a power cycle.

JAMES HEAL SERVICE & CALIBRATION

James Heal 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.

For any enquires you may have regarding your instrument please contact James Heal service & calibration by e-mail, phone or fax.

In all communications please quote the serial number of your instrument and the software version number - for example: 1666/16/1001 and V1.00.

James Heal Service & Calibration contact details:

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

Telephone +44 (0) 1422 366355

Fax +44 (0) 1422 352440

TECHNICAL DATA

Instrument Specification

2 Chamber Instrument

Impeller - Stainless steel

Rotational Speed - 1200 rpm

Calibration Service - UKAS accredited (based on ISO 17025)

Dimensions - W 267mm x D: 575mm (Including filters) x H: 523mm

Weight - 30 kg (approximately)

Power Supply - 85 - 264 VAC 50/60 Hz Power Rating 110 W maximum

4 Chamber Instrument

Impeller - Stainless steel

Rotational Speed - 1200 rpm

Calibration Service - UKAS accredited (based on ISO 17025)

Dimensions - W 410mm x D 575mm (including filters) x H 523mm

Weight - 46 kg (approximately)

Power Supply - 85 - 264 VAC 50/60 Hz Power Rating 140 W maximum

EU CONFORMITY

Impulse complies with the following directives:

- Machinery Directive 2006/42/EC
- Low Voltage Directive (LVD) 2014/35/EU
- Electromagnetic Compatibility (EMC) Directive 2014/30/EU
- Waste Electrical and Electronic Equipment recycling (WEEE) Directive 2012/19/EU
- Restriction of Hazardous Substances (RoHS) Directive 2011/65/EU

REVISION HISTORY

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

Revision	Date	Originator	Details Of Revision
1	13.12.2016	CL	First Issue
2	12.5.2017	CL	Removed standards button