James Heal

OPERATOR'S GUIDE

FlexiBurn

Multi-purpose Flammability Tester
Model 1880

TestWise™

Covering Serial Numbers
1880/18/001 and upwards

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

Publication 290-1880-1$B

Setting the Standard

Published by:

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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

FLEXIBURN – MULTI-PURPOSE FLAMMABILITY TESTER

The FlexiBurn flammability tester offers an effective and controlled way of testing ignition and flame spread properties of a range of materials.

To comply with various BS, EN, EN ISO and retailer standards, we offer a comprehensive range of easily interchangeable gas burners, test frames and test materials.

When used with the optional radiator assembly, FlexiBurn complies with EN 13772 'Burning behaviour – curtains and drapes- measurement of flame spread with large ignition source'.

Innovative engineering and intuitive understanding of your needs are combined to produce an aesthetically pleasing and ergonomic instrument, with intelligent, easy-to-use TestWise Test Software and a comprehensive library of international standards and retailers' own test methods.

Key features include

- Auto set up of standards
- Intuitive software – minimal training required
- Controls to ensure compliance

Technical Assistance

- Operator Training
- Knowledge transfer
- TestWise Software Online Maintenance and User Support
- Applications Support
- Engineering Support

SAFE INSTALLATION GUIDE

Introduction
This guide provides information regarding the safety, installation and technical details for the James Heal Flexiburn 1880.

The Operator's Guide must be read carefully before operating the instrument; refer to Operator Safety section where applicable.

The full Operator's Guides can be accessed here in our KnowledgeHub:
http://appsupport.james-heal.co.uk/support/solutions/5000155111

You are advised to carry out your own risk assessment for use in conjunction with this document.

James Heal instruments conform to EU requirements where required.

EU Conformity

- 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

FLEXIBURN 1880

The FlexiBurn is packed in a large wooden case. Any optional accessories will be packed around the instrument. Remove the case lid and unpack the optional accessories and loose items first. The instrument is fixed to the base of the case as two separate items, 1) the instrument, and 2) the base leg unit. To remove the instrument the case must be stood upright first then remove the brackets which secure the instrument to the base. Remove the sides. Finally lift the FlexiBurn out of the case. Please check that all of your accessories and consumables are present before disposal of any packaging material and report any discrepancy to the manufacturer.

These are the standard items packed with the Flexiburn:-

1 Mains Lead

1 17 mm Spacer (Burner tip to fabric face)

1 20 mm Spacer (Burner tip to fabric edge)

1 Wire Brush

1 TestWise software installed on a dongle

1 Burner Removal Tool

1 Pack of 6 Burner O Ring Seals

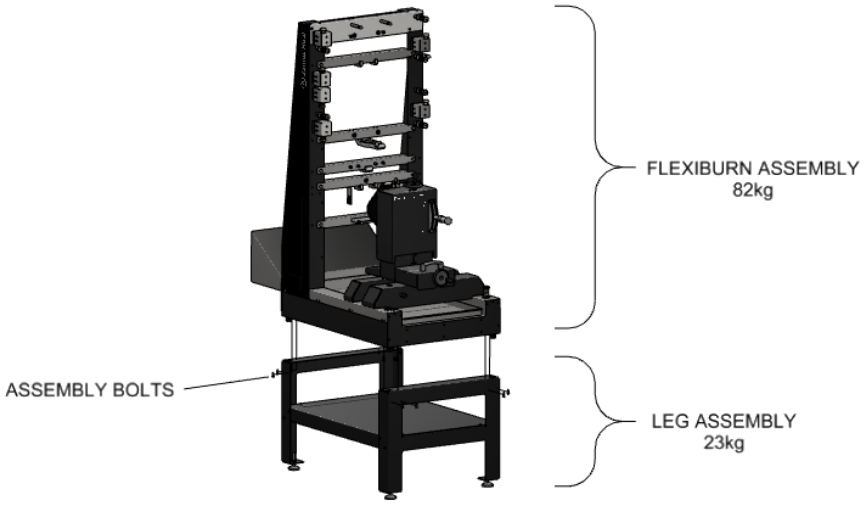
1 Cotton Trip Thread

Also check that the specimen frames and templates specified on your order are also present and any other optional equipment ordered.

Check the operating voltage stamped on the serial number plate is the same as your electrical supply.

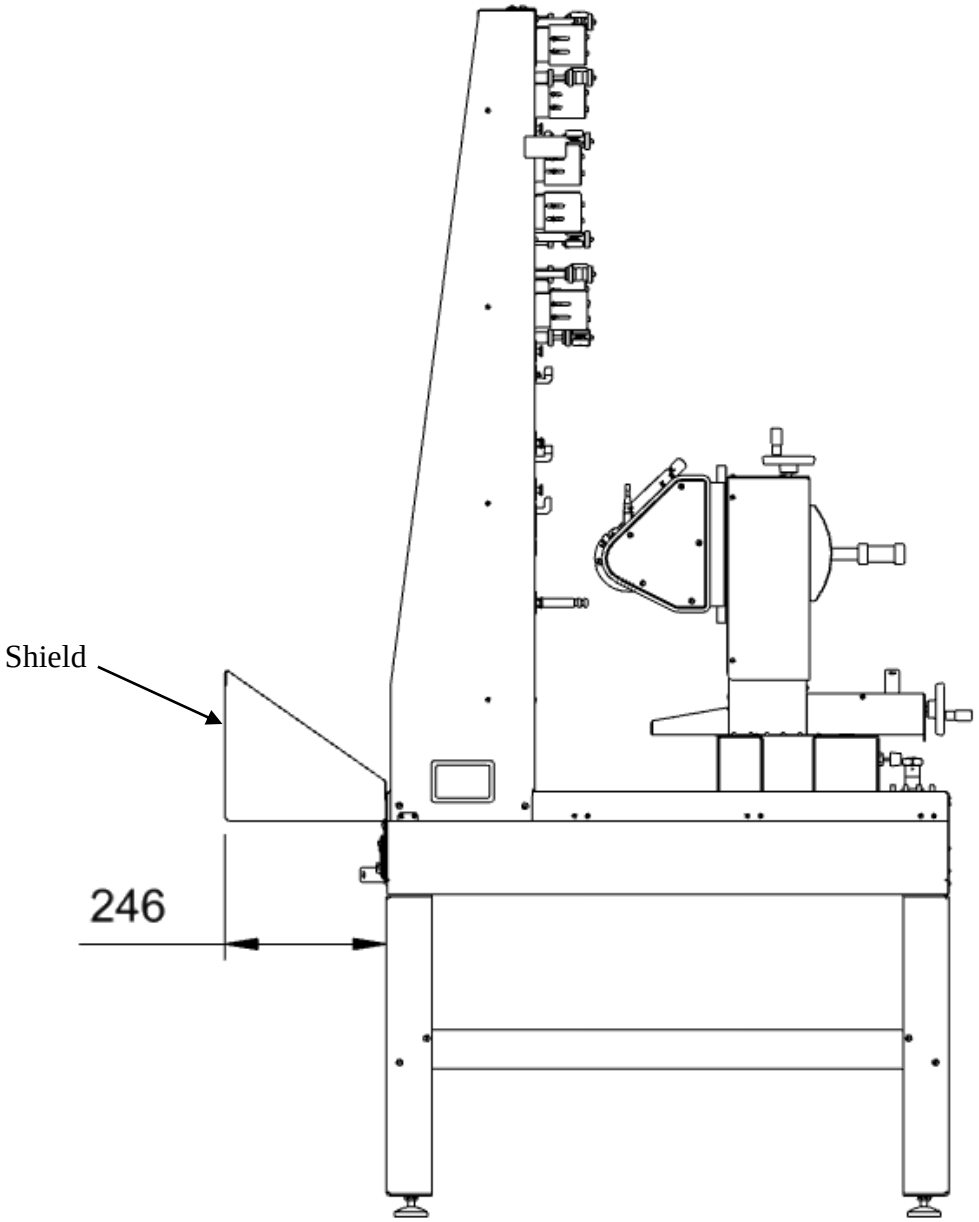
INSTALLATION

- The FlexiBurn can be installed on the base leg unit provided, or it can be installed on a suitable table or work surface provided by the user.
- If using the base leg unit provided, carefully lift the Flexiburn onto the leg unit and secure using the 8off M6x16 bolts provided.



- The FlexiBurn must be located in a separate room, or in part of a room which has been fully partitioned to accommodate it.

- On the rear of the machine a shield can be fitted which can be used to space the FlexiBurn from the Test Chamber wall and also cover the gas pipes and electrical cables to protect them from debris. The figure below shows the FlexiBurn with the shield fitted and the distance to the wall.



- The testing room must have a <u>minimum</u> volume of 4 m3.
- The construction of the room must be such to allow location of the rig inside and the control module outside. The rig must be clearly visible from the outside from the control module location.
- The atmosphere within the room must be within the following limits :
    - Temperature 15 - 30 °C
    - Relative Humidity 20 - 65 %RH
- Fireproof materials <u>must</u> be used in the construction of the testing room.

- The room must be fitted with an extractor fan or other means of ventilation to facilitate the clearance of smoke and fumes after a test. In certain situations, a sprung-loaded vent located low down on the wall opposite the fan will help to clear the atmosphere by allowing the ingress of fresh air when the fan is operating.

- Connect the gas supply/supplies to the gas inlet on the left hand side of the FlexiBurn. Two gas supplies can be connected at the same time. (See Fig below).

Details of gas supply

a	GAS TYPE	Commercial Butane to BS 4250 Commercial Propane for ISO 6940/1
b	SUPPLIER	Calor gas stockist
c	CYLINDER	Either 16 or 32 lb. type
d	REGULATOR	Calor engineering high pressure regulator or similar
e	PIPING	Calor engineering High pressure pipe of 3/16 inch (4.68 mm) internal diameter and complying with BS 3212

The gas cylinder should be placed outside the building/chamber.

The gas cylinder, regulator and piping are not supplied with the equipment.

FlexiBurn is not designed to be connected directly to a gas supply and a Regulator must be included in the connection between the cylinder and the FlexiBurn. The regulator is precisely set by the manufacturer to control the pressure of the supply and must not be adjusted. If a Regulator shows signs of wear, it should be replaced. Regulators must be marked BS 3016 or EN 12864.

For commercial propane, a typical bottle pressure is 20 bar – this must be Regulated down to 37 mbar.
For commercial butane, a typical bottle pressure is 2 bar – this must be Regulated down to 28 mbar.

Propane Regulator

Butane Regulator

- For further information and/or advice on any of these points, consult the building safety officer and/or the local fire prevention officer.

- The FlexiBurn should be levelled using the four adjustable
- To prepare the rig for testing, insert the debris tray into the slot at the base of the rig.

- Ensure the correct burner is in place. Should the burner require changing, the tool on the left hand side of the rig (See Fig 1 – ref. 20), fits over the burner and can be used as a spanner.

- The rig is now ready to carry out tests.

SAFETY RECOMMENDATIONS

- If a gas leak is suspected, disconnect the equipment from the gas supply and check it thoroughly. If in doubt, do not use the equipment until it has been checked by the manufacturer or other competent authority.

- Do not enter the test room or cabinet until the test is completed and the smoke and fumes have cleared.

- Always place the specimen frame on the rig before igniting the gas.

- Do not allow debris to accumulate on the rig or specimen frames. Check them and empty the debris tray regularly.

- Always turn off the gas supply at the cylinder after use.

- The rig has been designed for testing textile materials in the vertical plane. Materials with a large mass, with the potential to create a severe fire, must not be tested on this apparatus. E.g. Large toys, large pieces of flammable foams etc.

FRAME PREPARATION

Before using the FlexiBurn, ensure that the installation has been carried out correctly. Consult the Safety Installation Guide section for full details.

Check that the magnet keeper covers are removed (Fig 1).

Fig 1

Fit the required frame (fig 2 & 3). TAKE SPECIAL CARE WHEN HANDLING THE FRAMES AS THE PINS ARE VERY SHARP & ALWAYS KEEP THE COVER GUARD IN PLACE WHEN NOT IN USE.

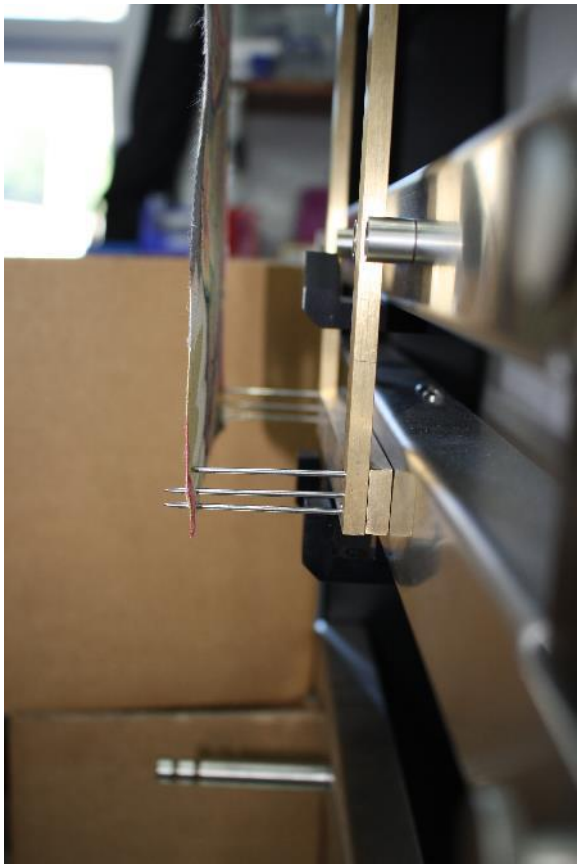
Fig 2

Fig 3

Place the specimen on the frame, pushing the pins through the fabric and resting on the spacer stubs (figs 4 & 5)

Fig 4

Fig 5



SWITCH ON

FRAME

From the front of the FlexiBurn go down the left-hand side and round the back to find the power cable socket and power switch. Plug the power cable into the frame & into a wall socket. Switch on at the wall & on at the rocker switch on the frame. When switched on, the start test button at the front of the frame will flash red (fig 6). This alerts the user that the TestWise Software is not open - Once open, the button will turn blue (fig 7)

Fig 6

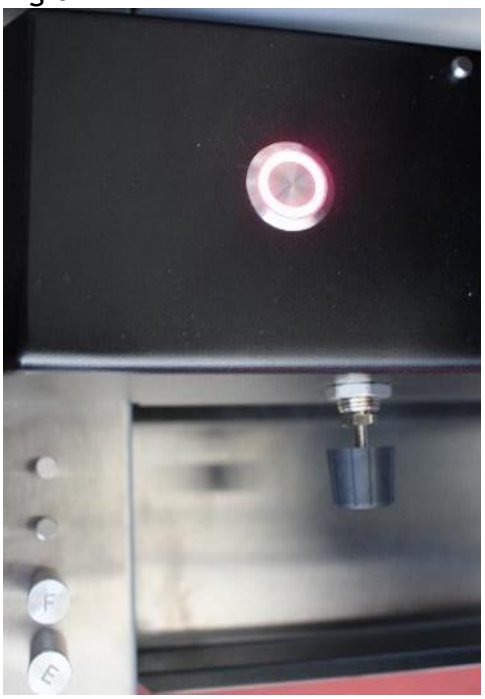
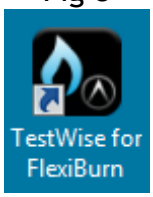


Fig 7

OPEN TESTWISE SOFTWARE

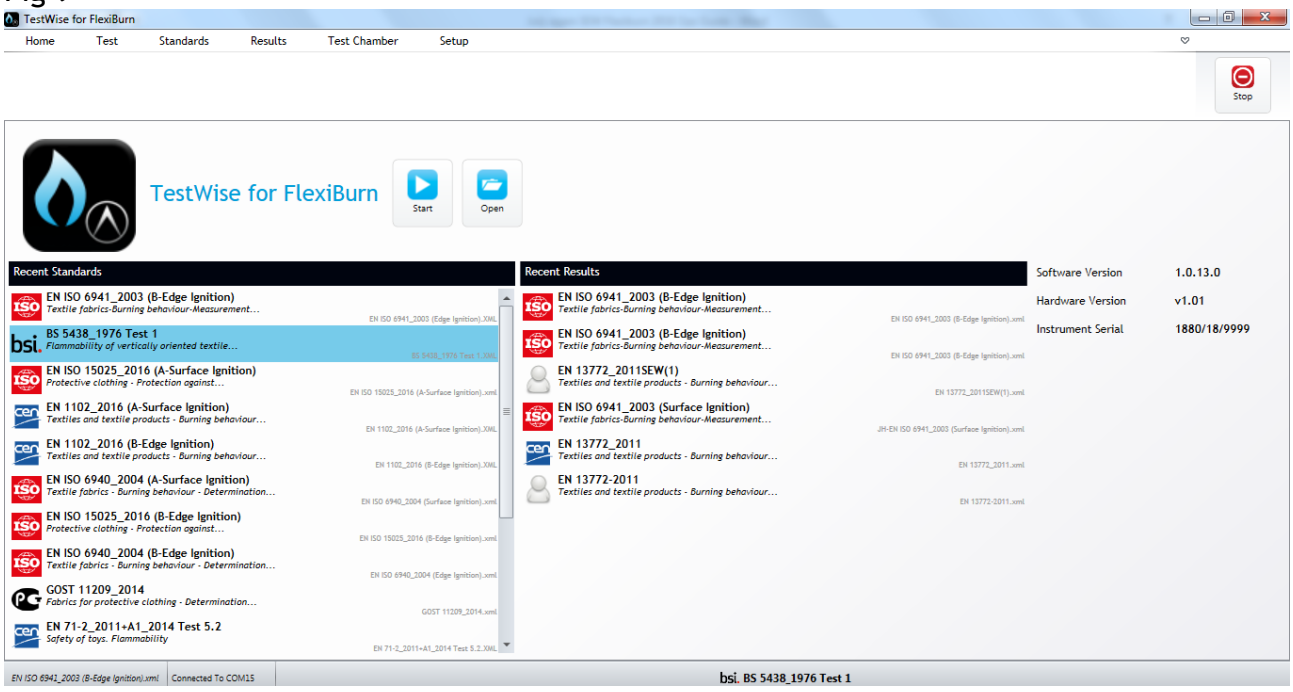
Open TestWise by selecting the 'TestWise for Flexiburn' icon on your desktop screen (fig 8), this will open TestWise and take you to the Home Page (fig 9).

Fig 8



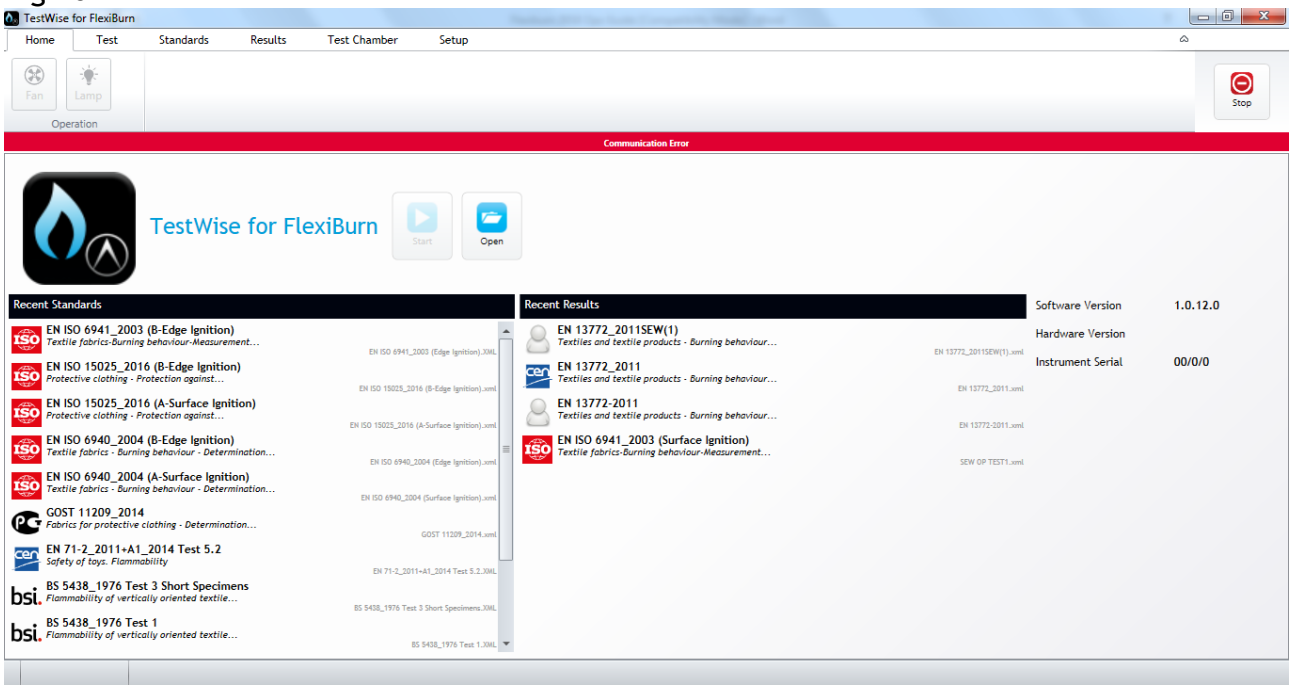
The menu for Recent Standards will appear on the left and Recent Results on the right. This page will intuatively populate with use and can be used to open recently used standards and to view recent results by highlighting the required standard and either selecting 'Start' to begin a new test or 'Open' to view recent results.

Fig 9



If the frame is not switched on the red Communication Error bar will appear prompting the user to switch the frame on (fig 10) The Start Test button on the front of the frame will also be flashing red. Turn the frame on as described in the ‘Switch on’ section of this guide.

Fig 10



POSITIONING THE BURNER & CARRIAGE

For all tests the burner and flame need to be set to the correct operating position.
To do this flame guages are used (fig 11) to set the distance between flame & specimen.
The burner housing carriage is manually moved into position.
The burner angle is positioned using TestWise.

The following will provide positioning guidance for both surface ignition and edge ignition tests. The principles of which are transferrable for all other testing.

SURFACE IGNITION TEST

SETTING THE BURNER ANGLE.

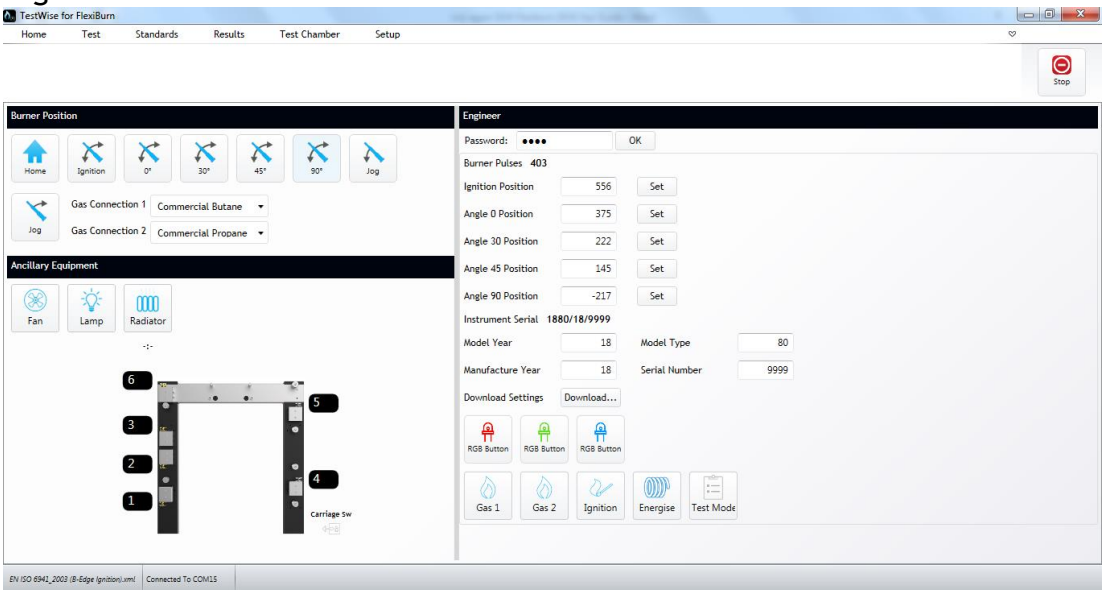
To ensure that the burner and flame are in the correct operating position choose the flame guage marked with an F (surFace (fig 11). When not in use these can be placed on the keepers next on the front left of the frame. The extra keepers are in place to hold other guages such as those used for toy testing etc. (fig 12)

Fig 11

Fig 12

In TestWise (fig 13) select Setup page found on the header ribbon at the top of the screen.

Fig 13

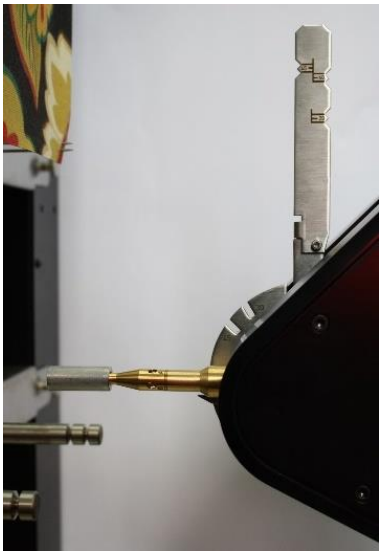


Locate the ‘Burner Position’ box on the left of the screen and click ‘Home’ to set the burner in the rest/start position - This must be carried out before the burner flame guage is placed on to the end of the burner.

Place the flame guage on the end of the burner (fig 14) then in the Burner Position box in TestWise (fig 8 above) select the angle required i.e. 90° and the burner will move to this position (fig 15).

Fig 14

Fig 15



POSITIONING THE CARRIAGE

HORIZONTAL POSITIONING

To move the carriage to the required position use the horizontal grab handle (fig 16 Top) to slide it forwards & backwards along the horizontal plane to place it in the approximate position required.

To fine tune the positioning, wind the circular handle at the front of the carriage (fig 16 Bottom) to bring the burner into the exact position required along this plane.

The graphics located above the circular handle & in front of the grab handle show which direction to wind the handle and on what plane the carriage will move – Turn to the right to move the carriage forward & left to move it backwards (fig 16 middle).

Fig 16

VERTICAL POSITIONING

Fig 17

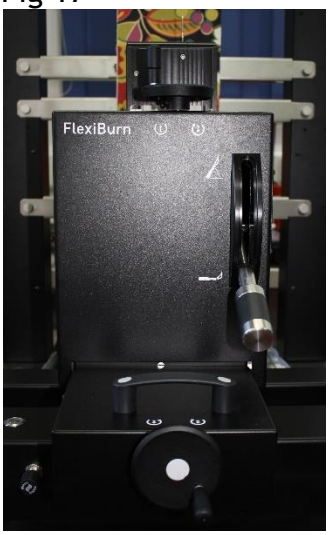


Fig 18

To vertically set the burner ensure the large leaver on the right of the carriage is positioned in the ‘down’ position, next to the graphic depicting the burner and flame on the horizontal plane (fig 17 & 18).

To move the lever, the spring loaded handle must be first pulled out towards the operator to allow for movement up & down the shaft. This moves the burner housing up and down. Be careful not to have the carriage too close to the specimen & frame when carrying out this operation to avoid any collision.

To set the burner into its exact position, turn the curcular handle at the top of the carriage to move into place (fig 19). The graphic in front of it next to the ‘Flexiburn’ logo depicts which direction to wind the handle and on what plane the carriage will move i.e vertically – Turn to the right to lower the carriage and to the left to raise it.

Fig 19

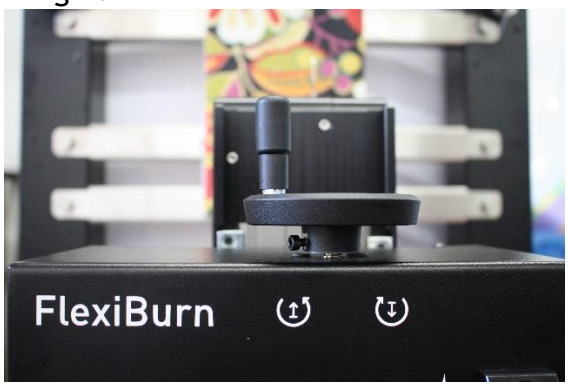
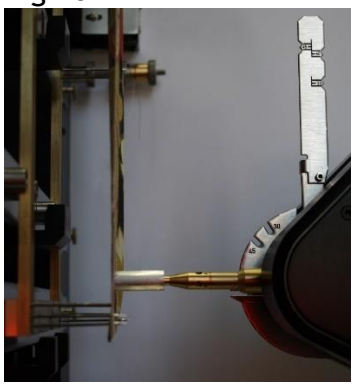


Fig 20



As the guage represents the distance required for the burner plus flame to be from the specimen, ensure that the guage just touches the specimen (fig 20).

Once set into position select 0° in Burner Position box (fig 21) on the TestWise software screen to return the burner to the rest/start position (fig 22).

Remove the guage – IMPORTANT! (fig 23)

Fig 21

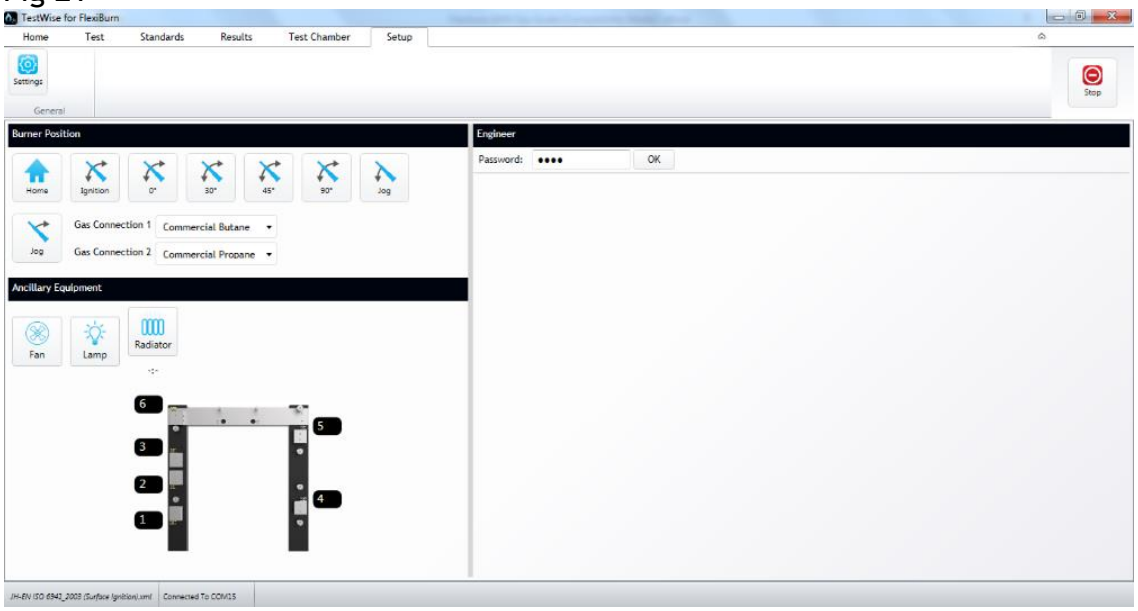


Fig 22

Fig 23

EDGE IGNITION TEST

To ensure that the burner and flame are in the correct operating position choose the flame guage marked with an E (**E**dge) (fig 24). When not in use these can be placed on the keepers next on the front left of the frame. (fig 25)

Fig 24

Fig 25

On TestWise (fig 26) select 'Setup' found on the header ribbon at the top of the screen. Locate the 'Burner Position' box on the left of the screen and click 'Home' to ensure the burner is in the rest/start position - This must be carried out before the burner flame guage is placed on to the end of the burner.

Place the flame guage on the end of the burner (fig 27) then select the angle required e.g. 30° and the burner will move to this position (fig 28).

Fig 26

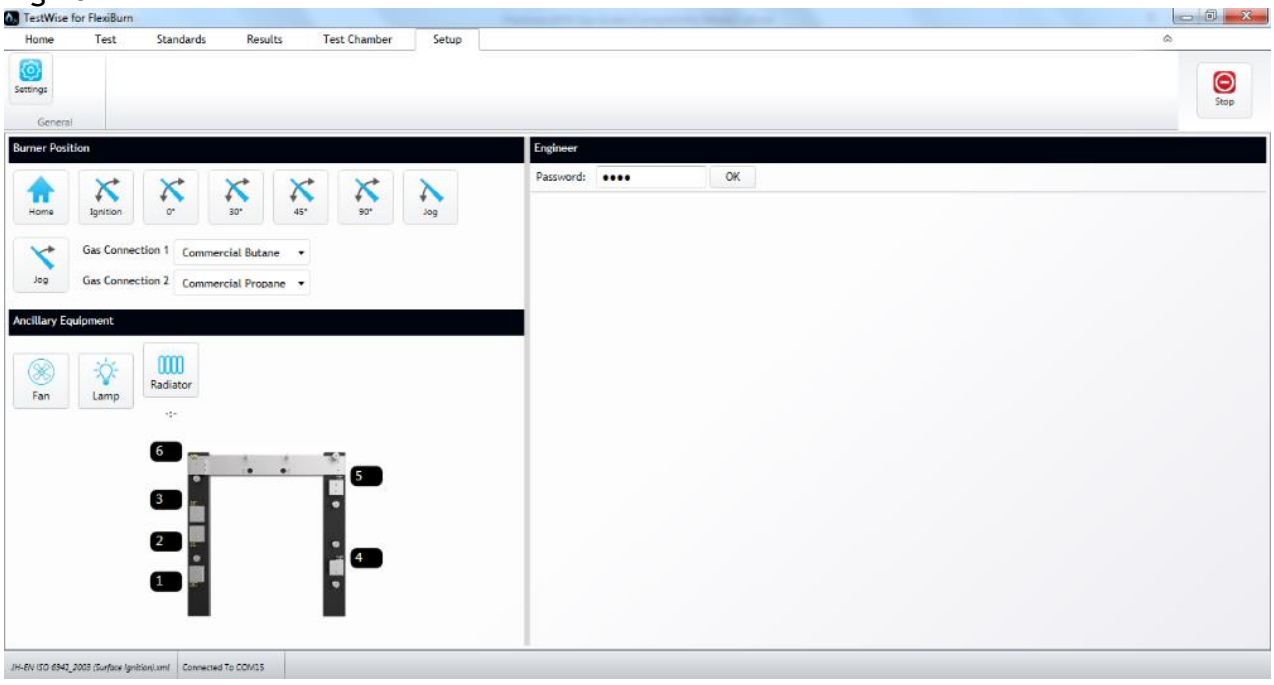


Fig 27

Fig 28

POSITIONING THE CARRIAGE

HORIZONTAL POSITIONING

To move the carriage to the required position hold the horizontal grab handle (fig 29 Top) at the front of the carriage to slide it forwards & backwards to place it in the approximate position required along the horizontal plane.

To fine tune the positioning wind the circular handle at the front of the carriage (fig 29 Bottom) to bring the burner into the exact position required along this plane.

The graphic above the circular handle & in front of the grab handle depict which direction to wind the handle and on what plane the carriage will move – Turn to the right to move the carriage forward & to the left to move it backwards (fig 29 Middle).

Fig 29

VERTICAL POSITIONING

To vertically set the burner ensure the large leaver on the right of the carriage is positioned in the ‘up’ position - next to the ‘Flexiframe’ graphic depicting the burner and flame at an angle (fig 30).

To move the lever, the spring loaded handle must be first pulled out towards the operator to allow for movement up & down the shaft. This moves the burner housing up and down. Be careful not to have the carriage too close to the specimen & frame when carrying out this operation to avoid any collision.

Fig 30

To set the burner into its exact position turn the curcular handle at the top of the carriage to move into place (fig 31). The graphic in front of it next to the 'Flexiburn' logo depicts which direction to wind the handle and on what plane the carriage will move – Turn to the right to lower the carriage and to the left to raise it.

Fig 31

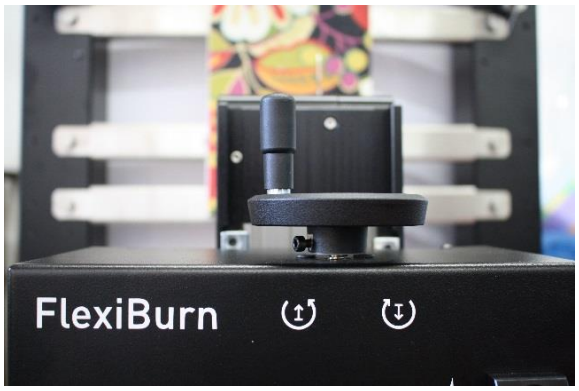
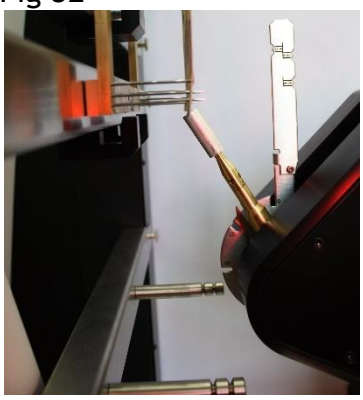


Fig 32



As the guage represents the distance required for the burner plus flame to be from the specimen, ensure that the guage just touches the specimen (fig 32).

Once set into position select 0° in Burner Position box (fig 33) on the TestWise software screen to return the burner to the rest/start position (fig 34).

Remove the guage – IMPORTANT! (fig 35)

Fig 33

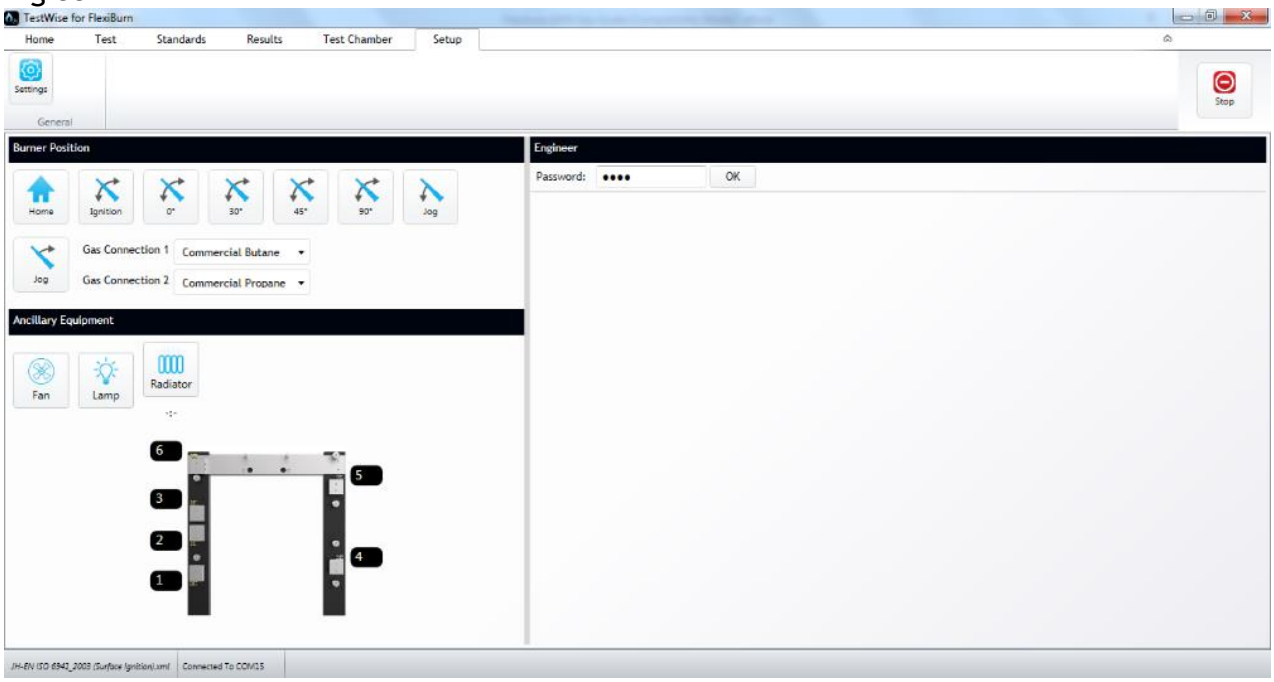


Fig 34

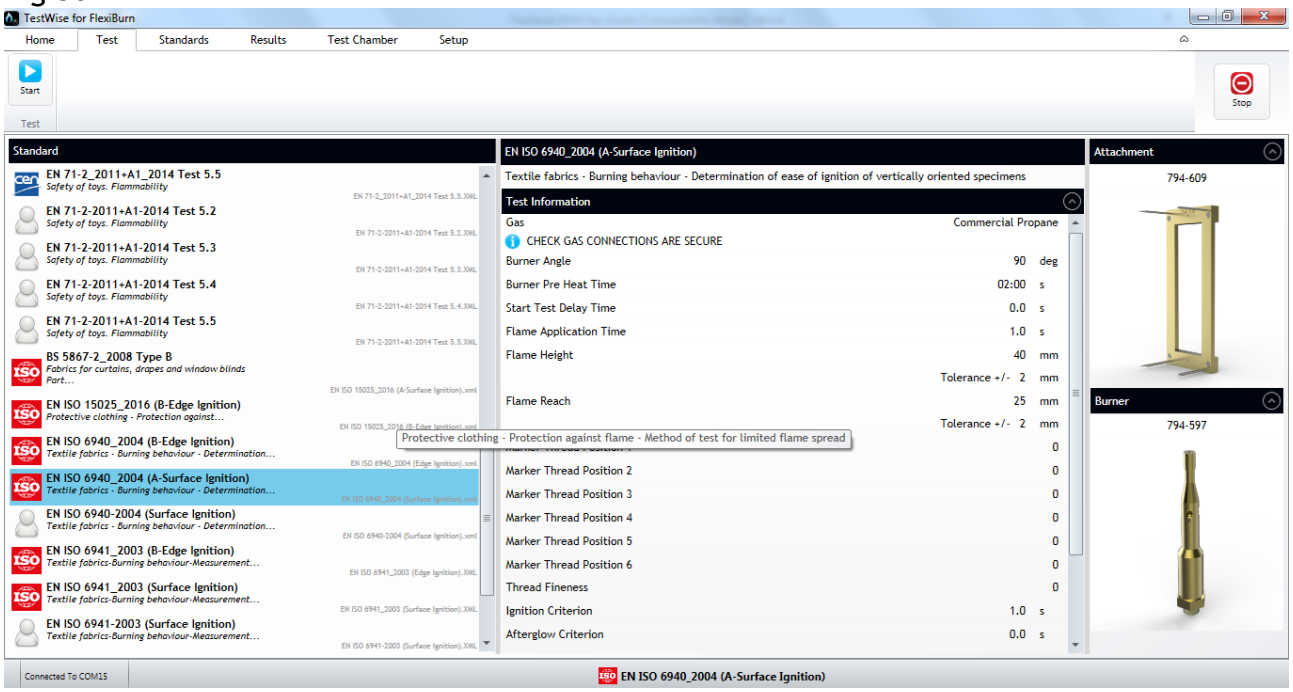
Fig 35

FLAME HEIGHT ADJUSTMENT

Once the the operating position of the burner has been set it is time to set the flame height required.

This can be established in TestWise by selecting the standard required in either the Test Menu or the Standards Menu and locating Flame Height parameters in the Test Information section (fig 36).

Fig 36

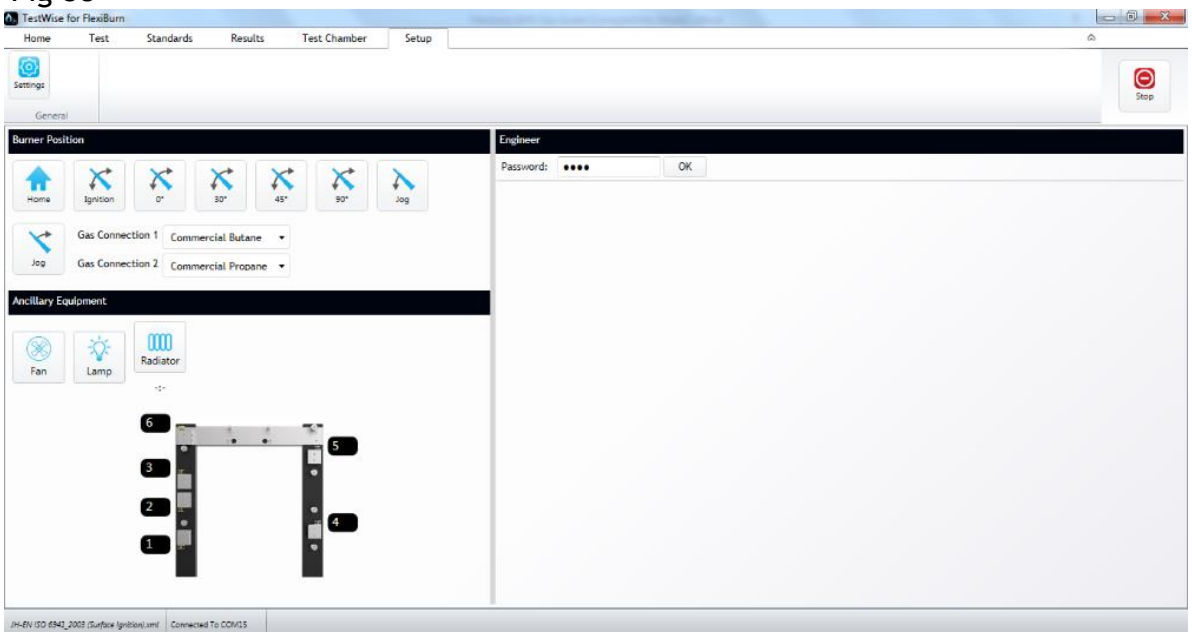


Firstly, ensure that the flame height measure is standing vertically (fig 37).

Fig 37

In TestWise, go to the Setup Menu on the top ribbon, select Home button within Setup to ensure the burner is set to the start/rest position (fig 38).

Fig 38



Turn on the gas knob at the front left of the frame (fig 39).

Again, on the Setup page - Select Ignition, this will prompt the burner move back to the ignition & to light (fig 38).

Once the flame is lit select the 0° button (fig 38).

The lit burner will now be infront of the flame measuring guage (fig 40), turn the gas knob on the front of the frame to adjust the flame height to the required setting (fig 39).

Once the correct height is achieved, switch the gas off by depressing the circular start/stop button (this can be seen above the knob on fig 41), for a couple of seconds and the extinguishing of the flame will indicate that the gas is off.

Fig 39

Fig 40

Fig 41

CAUTION!

THE FLEXIBURN PRODUCES A NAKED FLAME: EXCERSISE CAUTION WHEN OPERATING THE APPARATUS TAKING ALL REASONABLE MEASURES TO AVOID INJURY - ENSURE NO LOOSE CLOTHING IS WORN WHEN OPERATING & LONG HAIR IS TIED BACK.

KEEP A SAFE DISTANCE BACK FROM THE FLAME WHEN ADJUSTING THE FLAME HEIGHT – DO NOT LEAN IN TOO CLOSELY TO READ THE MEASURE.

DO NOT TOUCH THE BURNER AT ANY TIME WHILST THE FLAME IS LIT OR IMMEDIATELY AFTER USE.

IF THE BURNER NEEDS CHANGING ALWAYS ALLOW ENOUGH TIME FOR IT TO BECOME COMPLETELY COOL BEFORE CHANGING.

Once the measuring guage is completely cool it is good practice to pivot the guage backwards out of the way of the flame – USE A NON-CONDUCTIVE TOOL TO MOVE THE GUAGE - DO NOT USE HANDS TO DO THIS! However, it is only necessary to be moved back for tests where the measure would get in the way and inhibit the testing.

For the purposes of orientation the measure has been left standing in the majority of illustration photographs throughout this guide.

START TESTING

To begin testing select the Test Page found along the ribbon at the top of the page (or the Home Page if is populated with recently used standards and the standard you require is listed).

Select the required standard from within the Standard box by hovering the arrow over the standard to be used and click once the standard area will then highlight blue (fig 42).

The Standard selected & Test Information will show in the central section whilst on the right will be an illustration of the attachments & burner required along with the stock number.

Scroll over any of the standards or parameters and further information will appear.

In the Test Information section, there is a safety information line at the top advising the user to check the gas connections are secure before use. The connections are found at the back of the frame (fig 43). If unsure about how the gas should be connected please refer to the Installation section within this guide.

Beneath the safety information line are found the test parameters.

To open the selected test either double click on the test area or select start.

Fig 42

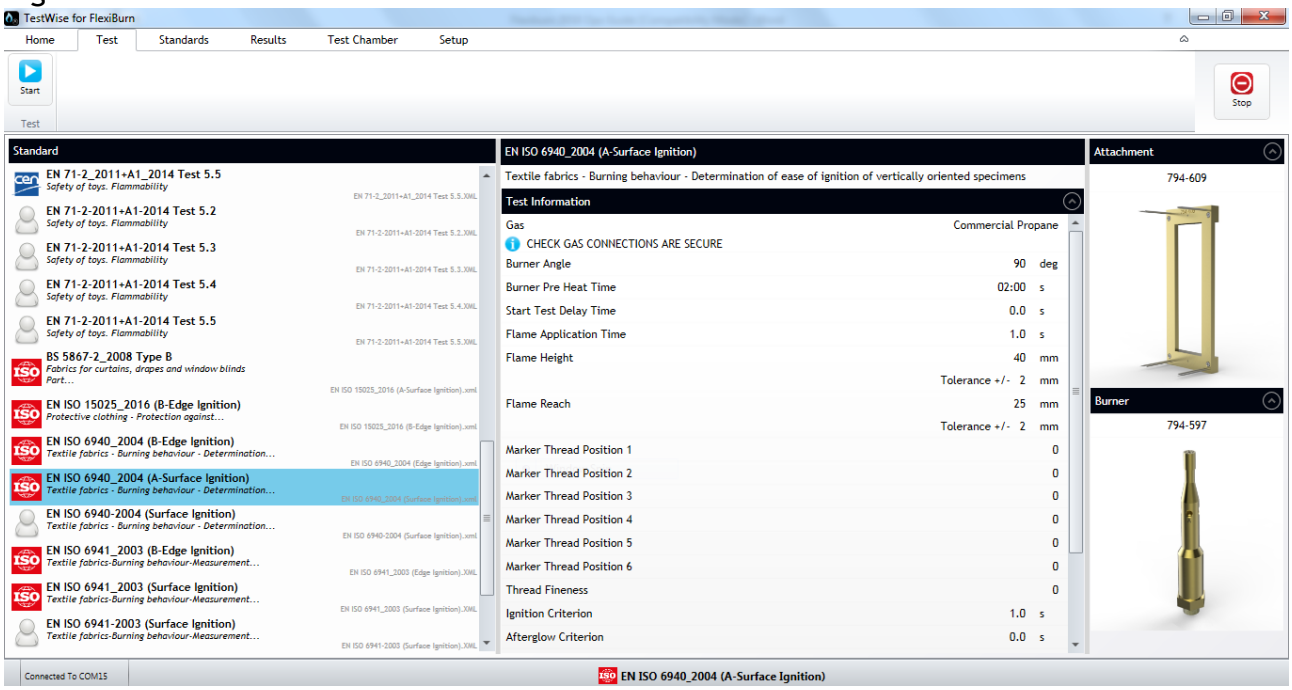


Fig 43

If the gas is not detected or attached to the frame the ‘Gas Unavailable’ box will appear in the centre of the screen to prompt the attaching and/or turning on of the of the gas (fig 44).

Refer to the installation guide on how to attach the gas.

Go into Setup and choose the correct gas (as outlined in the Gas Unavailable box) in the dropdown box next to the appropriate gas outlet into which the gas is being fed (fig 45). Once done select OK.

Fig 44

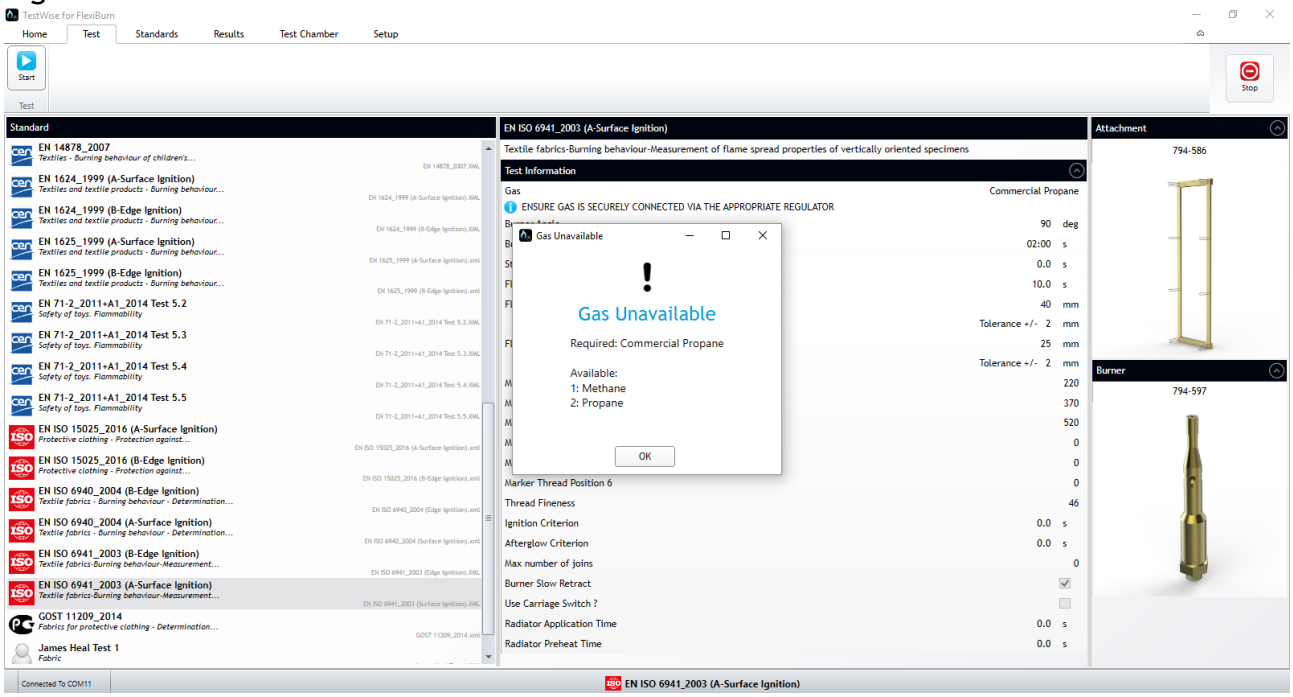
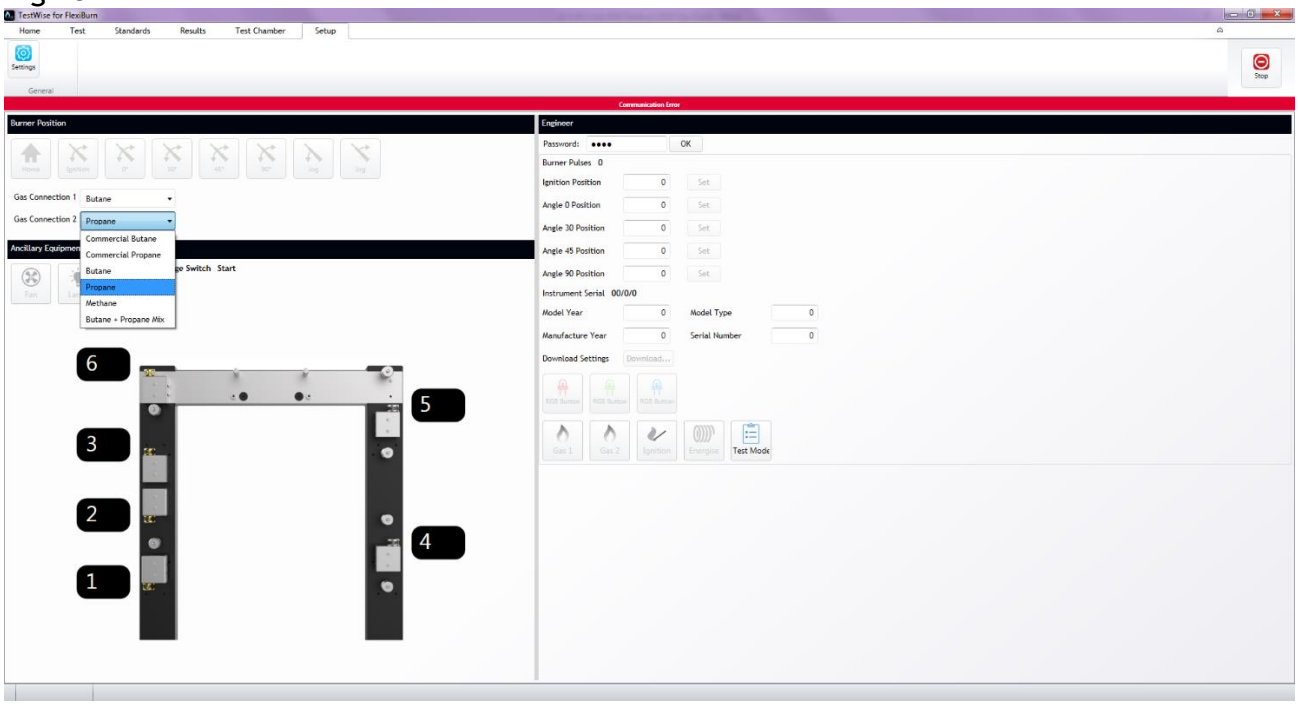
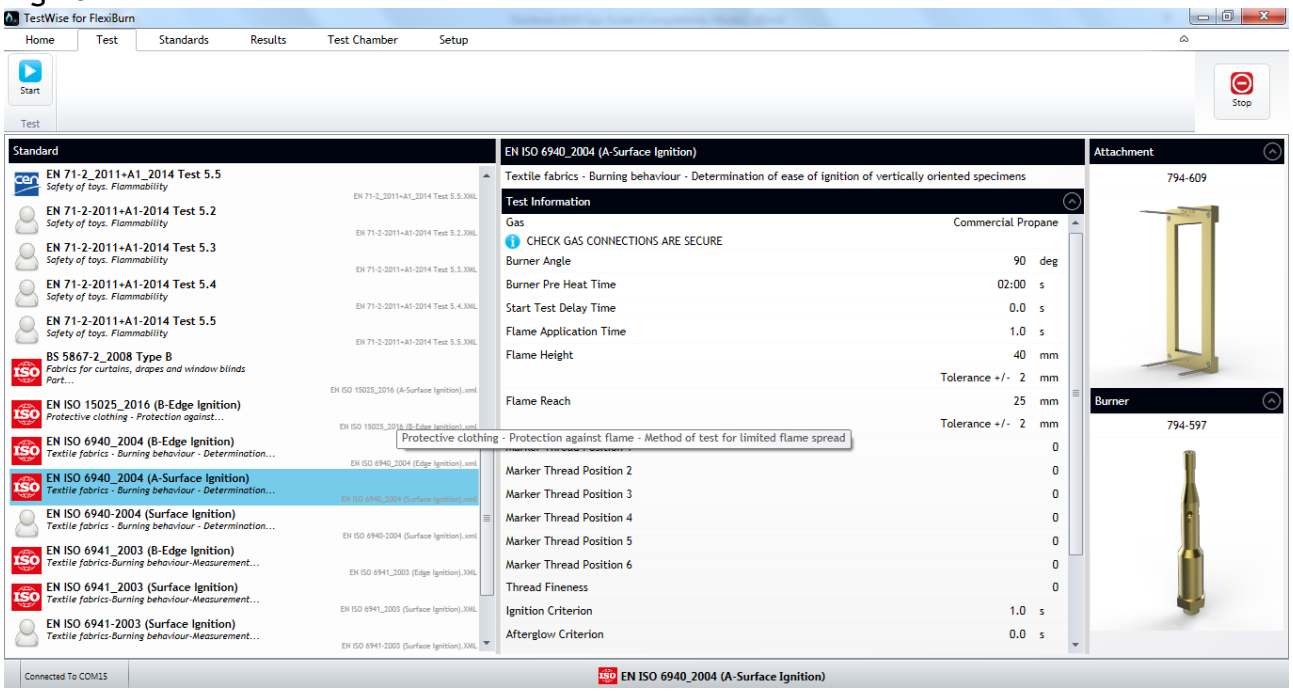


Fig 45



Once it is ensured that the gas is attached and turned on, double click on either the highlighted standard or single click on the start icon (fig 46). This will then open the Run Test page.

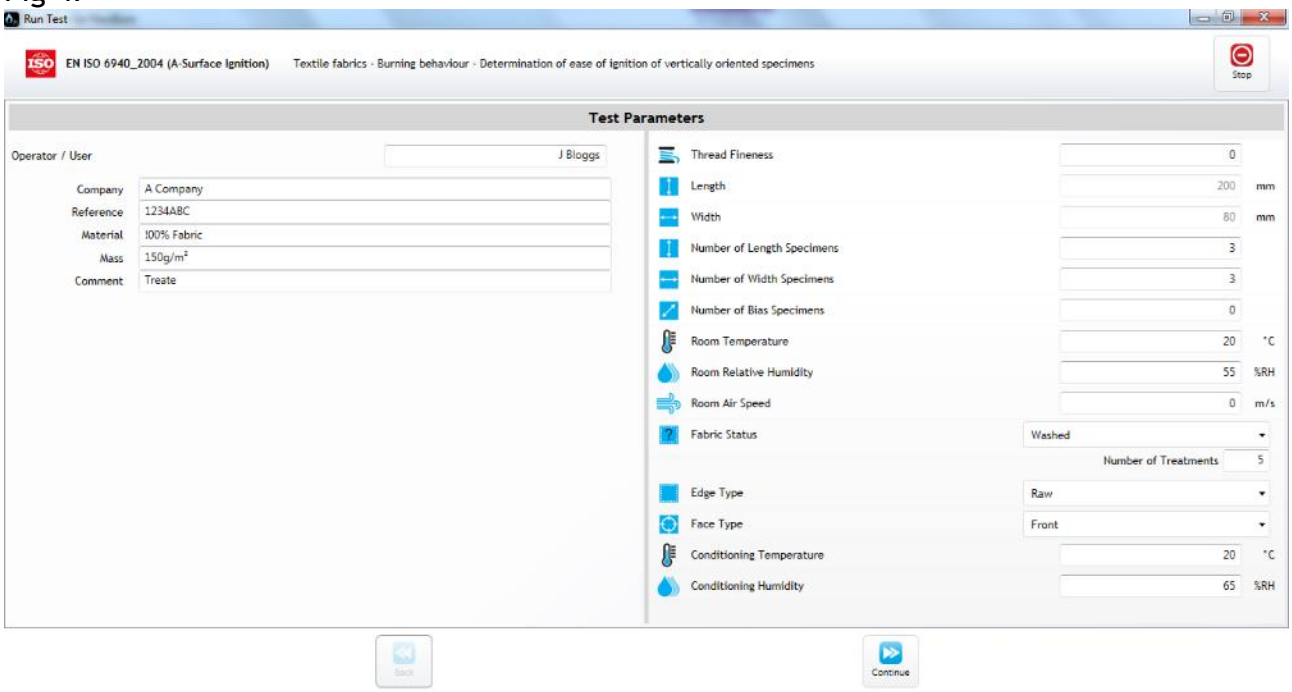
Fig 46



RUN TEST PAGE

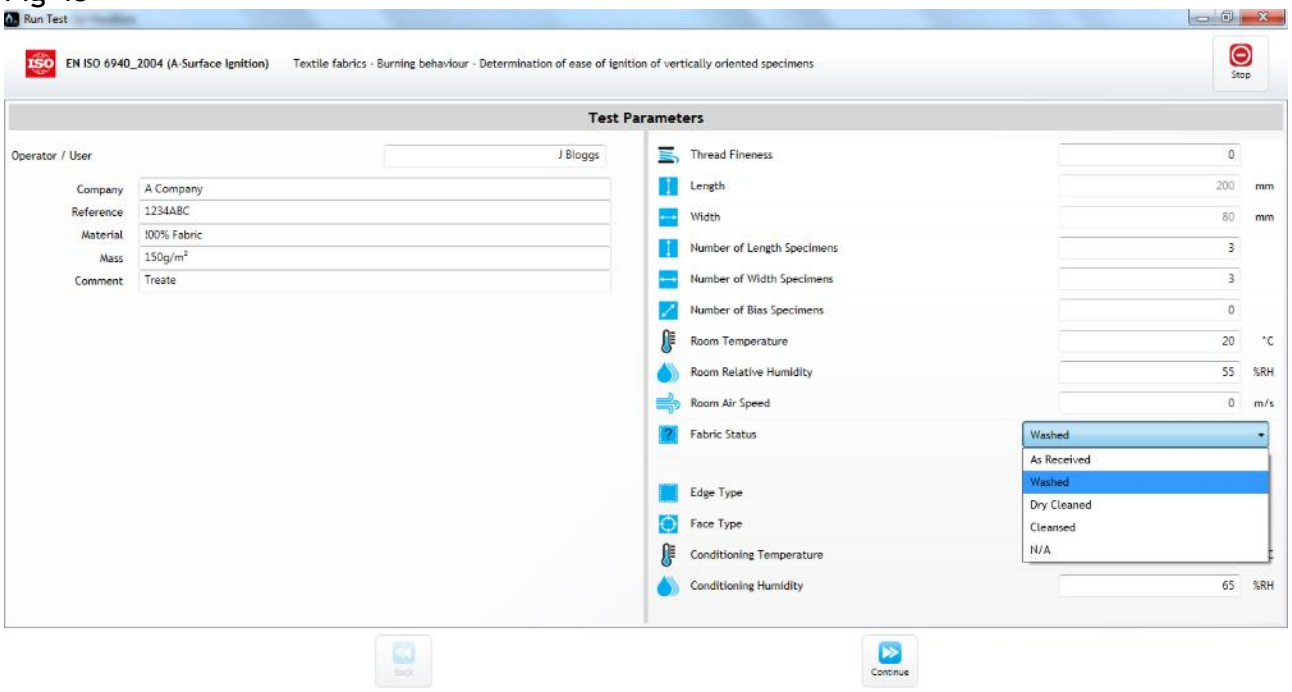
The Run Test page will appear showing the Test Parameters box (fig 47) Populate each field as required by clicking in the relevant box and typing in the necessary information.

Fig 47



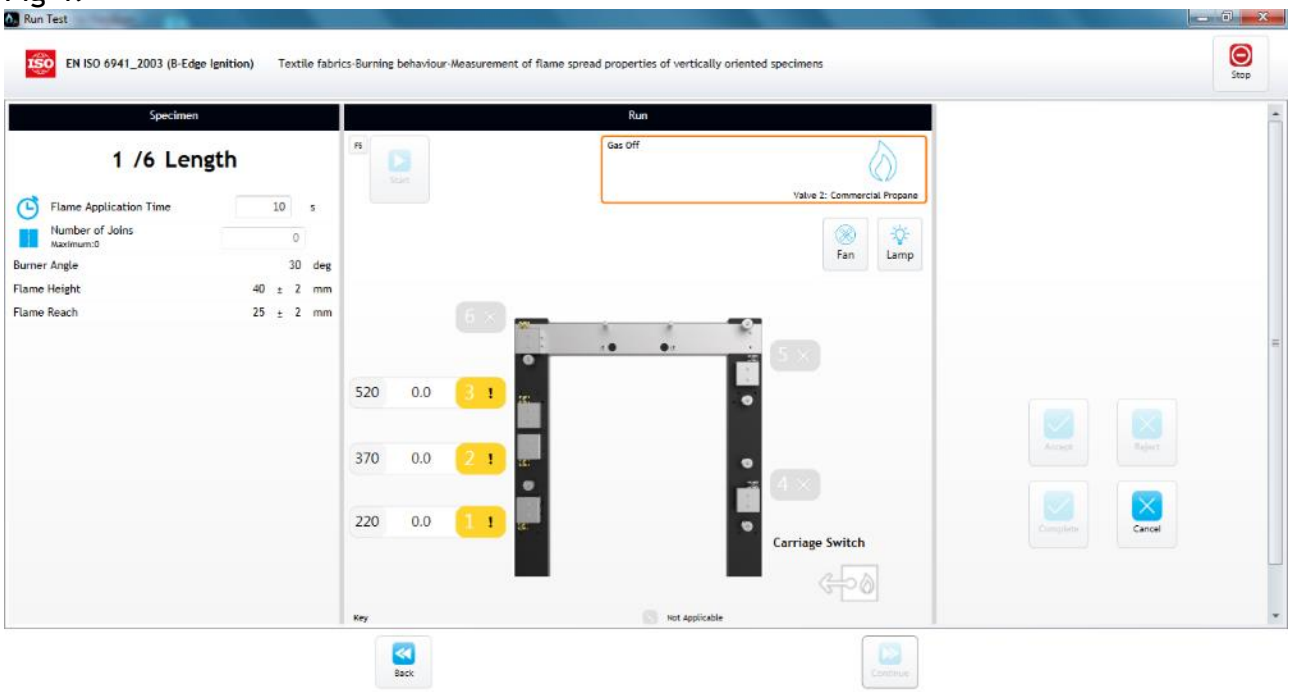
All parameters with an arrow to the right side of their box have drop-down menu's from which to select from (fig 48) These parameters are: Fabric Status, Edge Type, Face Type. The Fabric Status parameter allows for the number of treatments to be listed if a treatment field has been selected.

Fig 48



Once all the required fields have been populated select continue.The test page depicting the FlexiBurn frame graphic will now appear (fig 49).

Fig 49



The Specimen box, on the left, shows the specimen number being tested along with the number of specimens to be tested. The orientation of the specimen is also shown.

Beneath this the sewing joins, burner & flame paramaters are displayed.

Flame Application Time and Number of Joins fields (where set as part of the test parameters) can be can be completed.

The other parameters are set to the selected standard's specifications and cannot be changed.

To the right is the Run field showing the frame graphic centrally.

Where marker/trip threads are required (should they be required by the standard), these fields will highlighted yellow.

It is now time to thread up the marker/trip threads.

THREADING UP

The following threading up description is for standard BS EN ISO 6941, however the principle is the same for all standards that require timed marker/trip threads.

PHYSICAL THREADING UP METHOD

Thread each marker/trip thread from the right securing the thread between the 1st spacer and the nut (closest to the frame) traversing across the specimen face, round the corresponding nut (which is two cones on congruent axes with their apexes together looking like so: and holds the thread trip detection wires) and affix back in place between the 1st & 2nd (larger) spacer. (figs 50, 51 & 52)

The threads must have enough tension applied to ensure that the trip wires are pulled in.

The back thread will lie across the specimen whilst the front thread will stand proud of the specimen. (fig 53)

The frame fully mounted with specimen holder, specimen & threads will look similar (dependent upon the standard being employed) to the photograph seen in figures 54 & 55.

Fig 50

Fig 51

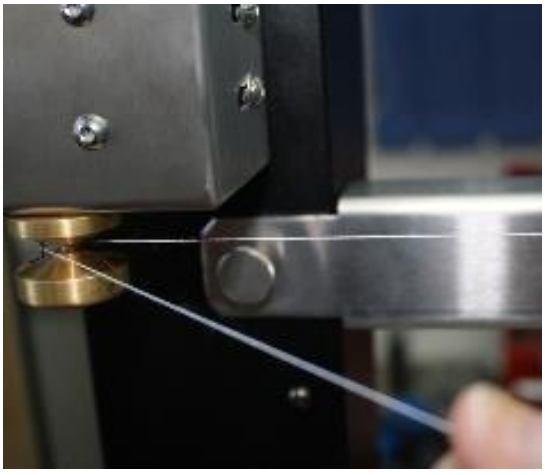


Fig 52

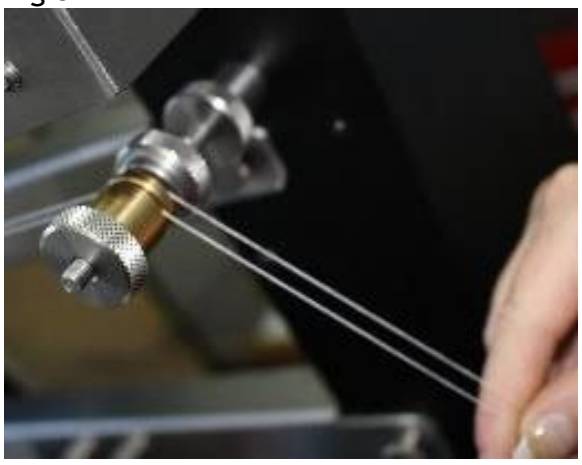


Fig 53

Fig 54

Fig 55

To check the th

TESTWISE - THREADING UP

On the TestWise software Run field you will see the trip fields change from yellow to blue as each thread is put in correctly place. If the threads do not go round the trip wire with sufficient tension placed on them to draw them in, the trip fields will not turn blue nor will the blue thread line show across the frame on the diagram (fig 56)

Similarly, if the threads are placed in the wrong place for the test setting then the corresponding field and thread line will appear red on the diagram (fig 57).

When all the threads are correctly placed all the thread fields will turn blue along with the thread placements on the diagram which will now be visible. The start icon will also become active (fig 58).

Once the this is all in place it is time to start the test.

Fig 56

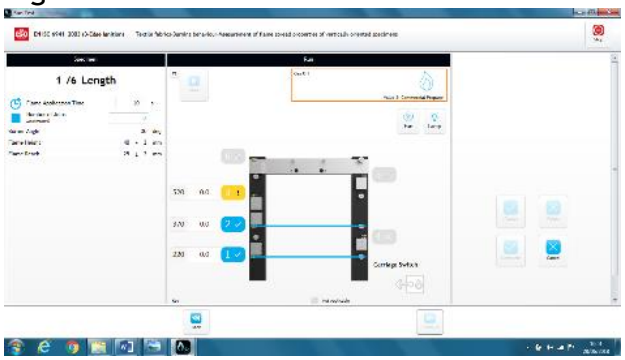


Fig 57

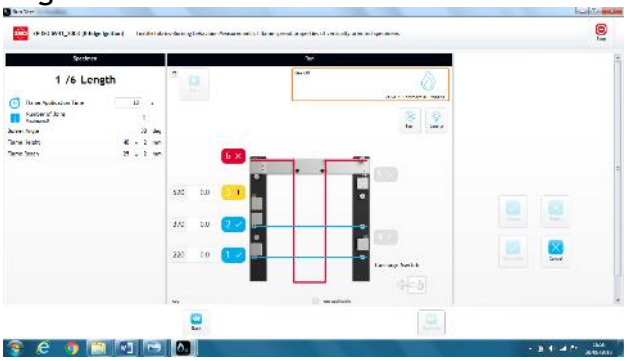
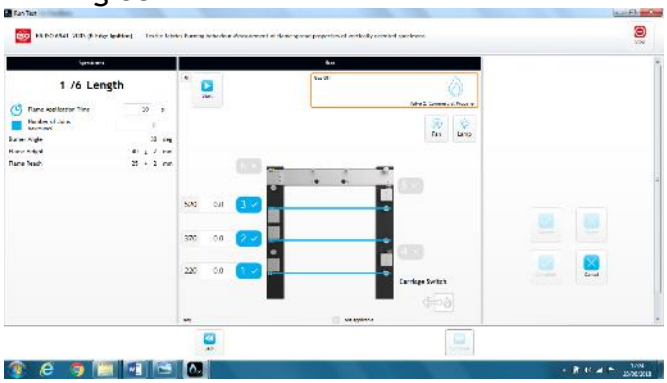


Fig 58

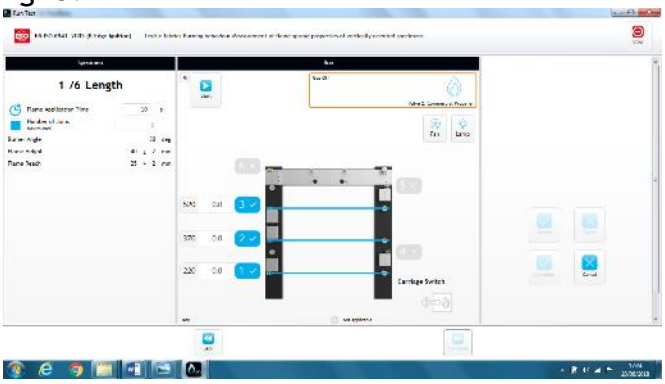


CONDUCTING TEST

FLAME IGNITION & PREHEATING BURNER

Click on the start button on the software (fig 59)

Fig 59



The Gas/Burner information box outlined in orange will now have changed from reading ‘Gas off’ to ‘Press button to ignite flame’ (fig 60). Locate the Start Test button situated on the left of the burner housing – it will be flashing blue (fig 61).

Fig 60

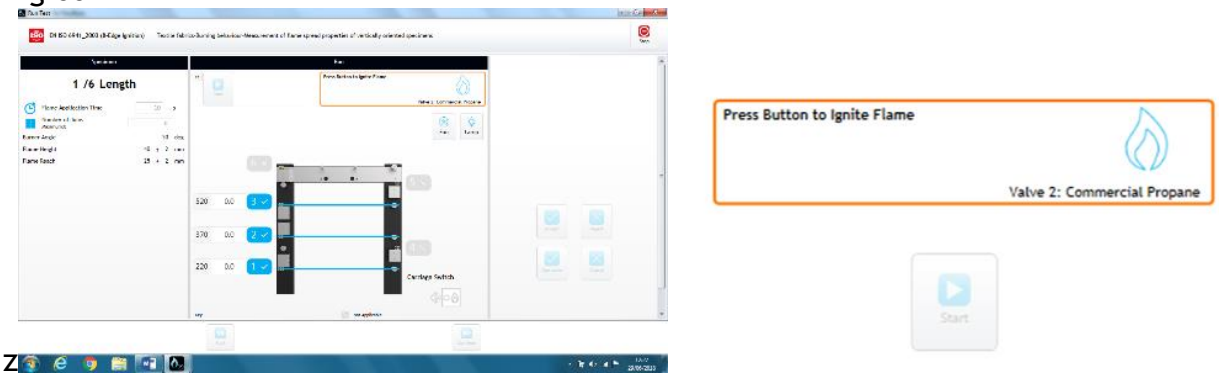


Fig 61

Depress the button and the buner will ignite, very briefly TestWise will show ‘Waiting for flame’. A clicking sound will be heard whilst the button is being depressed & will stop once the finger is drawn away.

The burner will automatically move from its Start Position (fig 62) backwards to the Ignite Position (fig 63) and ‘Moving to Ignition’ will flash up on TestWise.

Once lit, the burner will return to the vertical position to pre-heat for 2 minutes (fig 64)

(NB This pre-heat time may be used on the first test to adjust the flame height but it must be ensured that the flame height measure is in the vertical position to do this and the operator has the skill to adjust the height correctly in the time allowed).

On TestWise, the count down will show in the burner status box which will now have turned from having an orange outline to having a blue outline (fig 65).

If Preheat is not required then simply click on the Skip icon to go to the next stage – Flame Application.

Fig 62 Start position

Fig 63 Ignition position

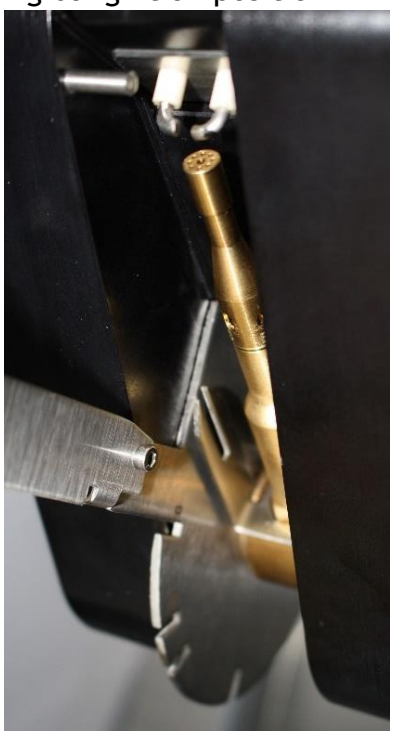
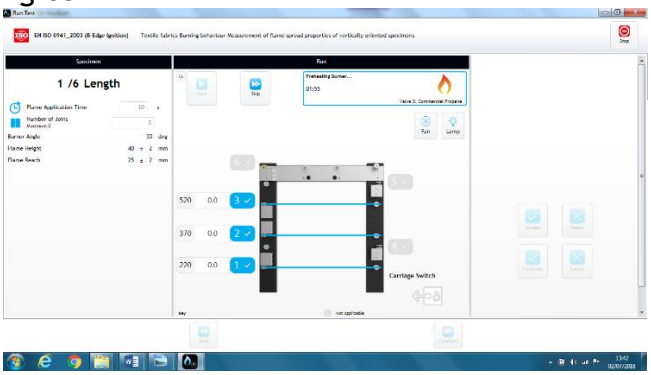


Fig 64 Preheat position

Fig 65



FLAME APPLICATION

Once preheated (or skipped), the burner will move to the Flame Application position (fig 66) required and apply the flame for the required amount of time as stated in the standard e.g 10 seconds. Once the flame application time has elapsed the flame will cease to be ignited and return its vertical resting position (fig 67).

Fig 66 Flame Application Position

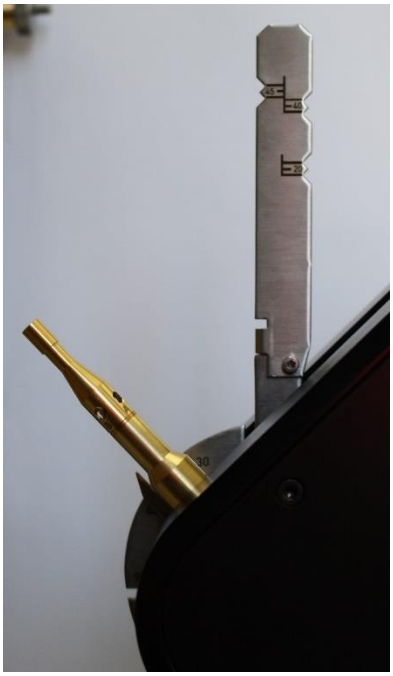


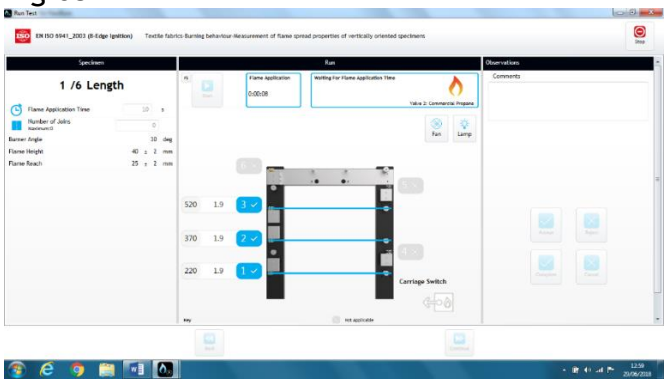
Fig 67 Resting Position

On TestWise - the Burner Status box will show the flame application timer countdown and show ‘Waiting for flame application time’ status. (fig 68).

Once the time has elapsed the Burner Status box will read ‘Removing Flame’ and the outline will turn blue (fig 69).

Also at the point of flame application the timers next to each thread line on the diagram will begin to count up. These will cease on the tripping of the timer wire when threads are burnt through or the test is stopped.

Fig 68



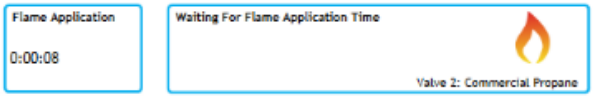
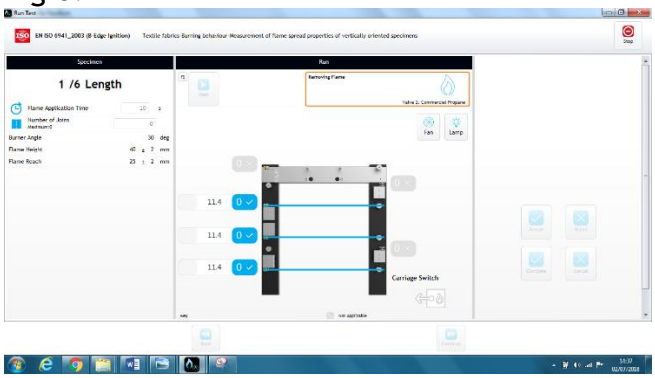


Fig 69



THREAD BREAK

If the specimen has ignited, as the flame reaches & burns through each thread marker causing the timer trip wire to release, the corresponding timer will stop on the TestWise threading diagram. Also dipicted will be the thread showing as broken with both the box and thread turning from blue to orange (figs 70, 71, 72 & 73). 'Waiting for Thread Break' will also show until all threads have burnt through.

Fig 70

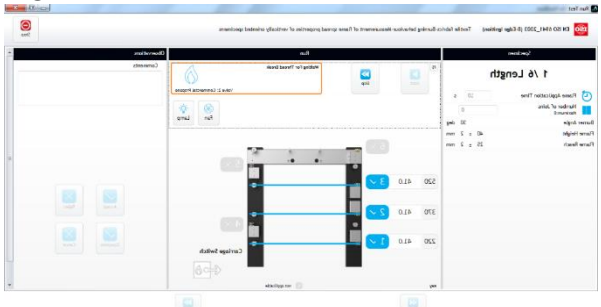


Fig 71

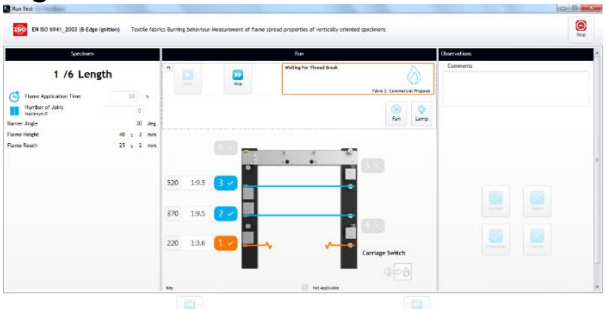


Fig 72

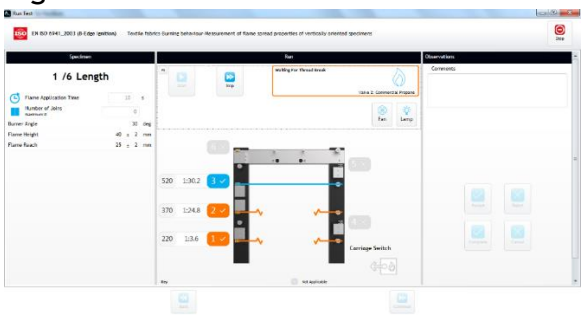


Fig 73

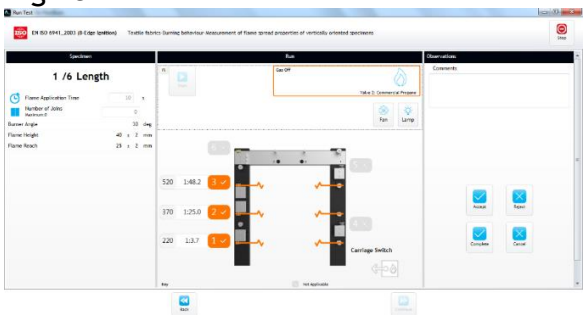
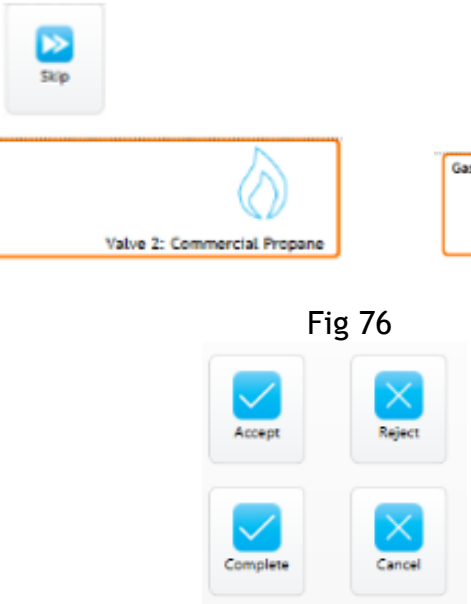


Fig 74

Fig 75

Fig 76



Once all threads have burnt through, the Burner Status box will change from stating ‘Waiting for thread break’ to ‘Gas off’ resting mode (figs 74 & 75).

Four blue icons will now appear on the right of the test screen showing Accept, Reject, Complete and Cancel (fig 76).

Accept – Accepts the current test specimen results and resets the test screen tor the next specimen (fig 77).

Reject – Rejects the test specimen and resets the test screen keeping the same specimen number (fig 78).

Complete – (Figs 79 – 84) Allows the operator to complete the test any time before the specified number of samples have been tested, returns to the main Test page and displays centrally the ‘Save’ box.

Prompting the operator to ‘Save results now?’ - ‘Yes’ will save the results which can then be found in the main Results page – the selector for which can be found at the top of screen. ‘No’ will simply not save the results data. Both options will result in the operator being returned to the main Test page.

Cancel – Cancels the test and returns to the main Test page (fig 85)

Fig 77 Accept

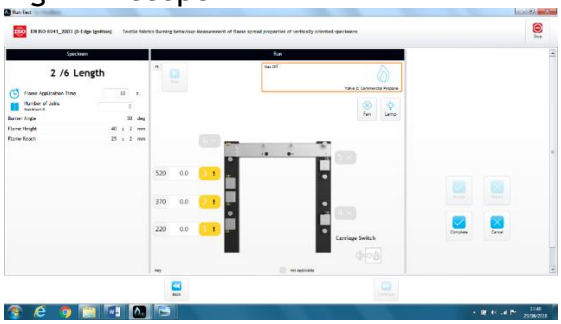


Fig 78 Reject

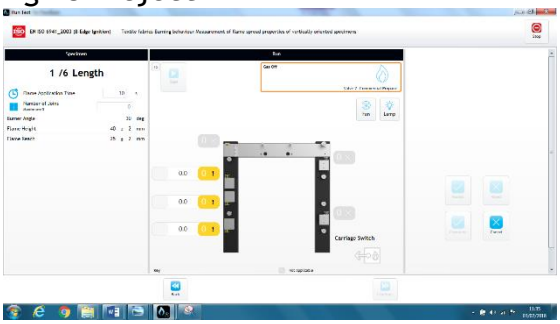


Fig 79 Complete & Save (1)

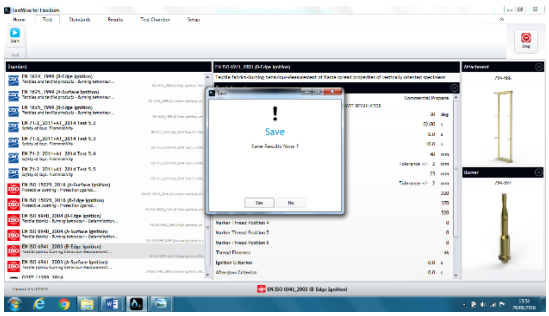


Fig 80 Complete & Save (2)

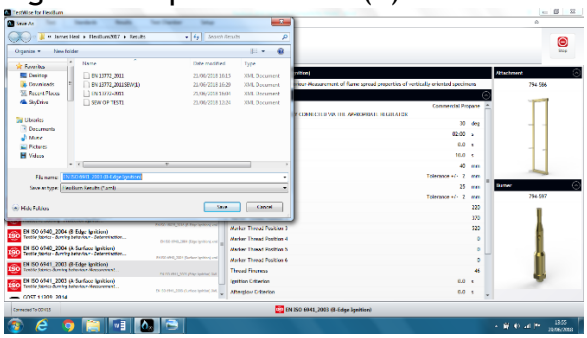


Fig 81 Complete & Save (3)

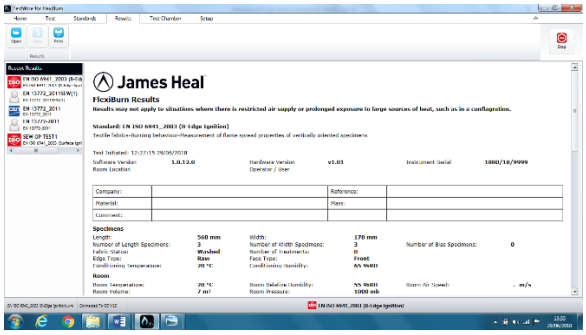


Fig 82 Complete & Save (4)

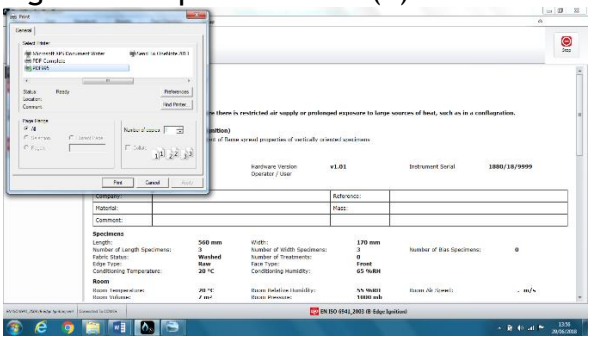


Fig 83 Complete & Save (5)

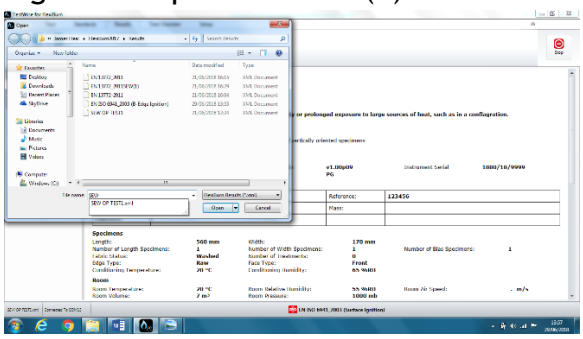


Fig 84 Complete & Save (6)

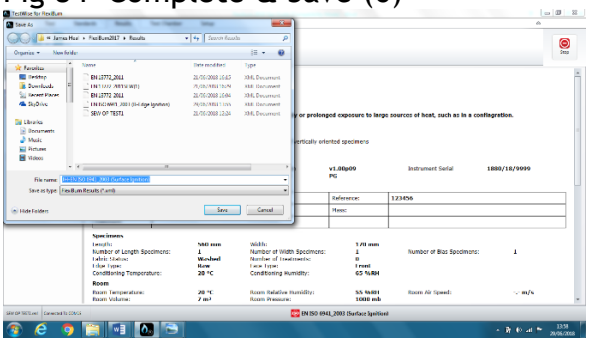
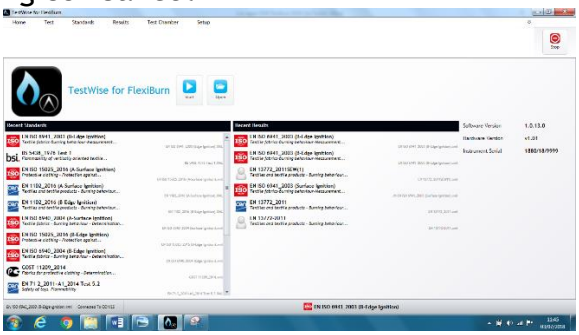


Fig 85 Cancel



SAVING COMPLETED TEST RESULTS

When all specimens have been tested the operator will be automatically returned to the main Test page where the ‘Save’ box will show centrally asking the operator to ‘Save now?’ giving the option ‘Yes’ or ‘No’.

Selecting ‘No’ will simply not save the results.

Selecting ‘Yes’ will allow the operator to save the results wherever they choose as an xml file.

Printing Results – To print results click on the Results tab at the top of the page and select the print icon.

Results can also be Opened & Saved using this Results Menu selection method should the operator wish.

TEST RESULTS PAGE

The Results page is found on the ribbon at the top of the page between the Standards & Set Up pages. To access this simply click on the tab and the results page will appear.

If TestWise has just been opened only the left Recent Results column will be populated and the right side blank (fig 86) - If software is newly installed all fields will be blank (fig 87). If a test(s) have been completed in the current session then the most recent test results will show on the remaining three-quarters of the page (fig 88).

Select the results required by highlighting the required test results found in Recent Results, click once and a box will appear in the centre of the test results page area asking if the selected results are required to be opened or double click on the highlighted results and the test result sheet will appear to the right of the Recent Results box (fig 88).

Results can be saved or printed by selecting the save or print icon adjacent to the blue 'Open' selector on the top left of the screen.

Fig 86

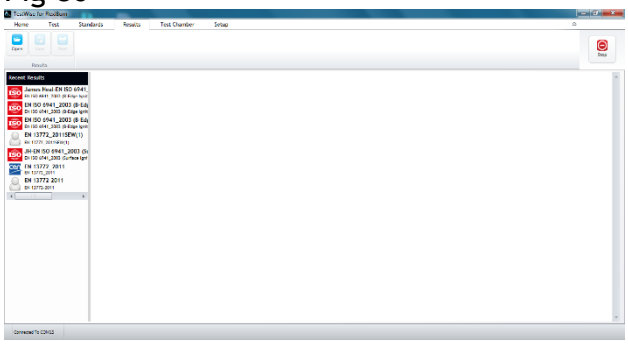


Fig 87

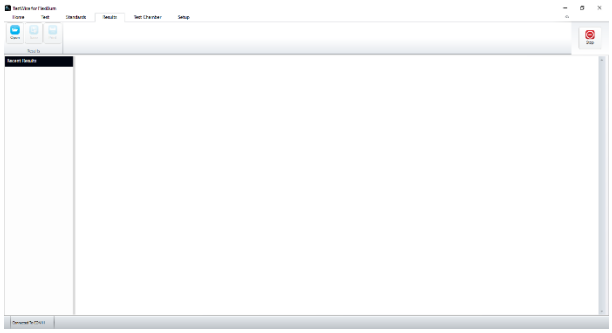
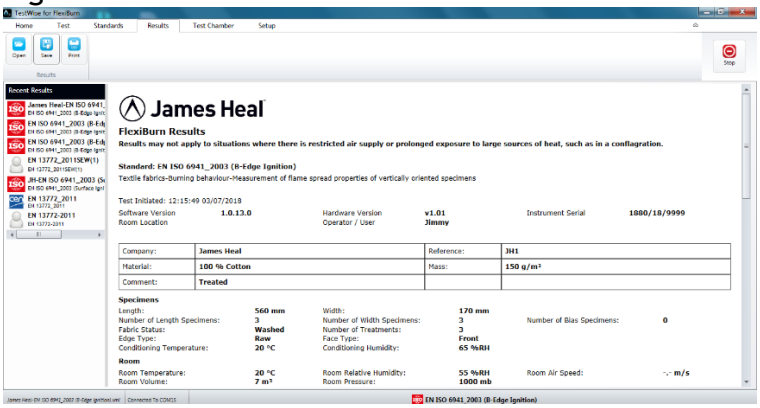


Fig 88



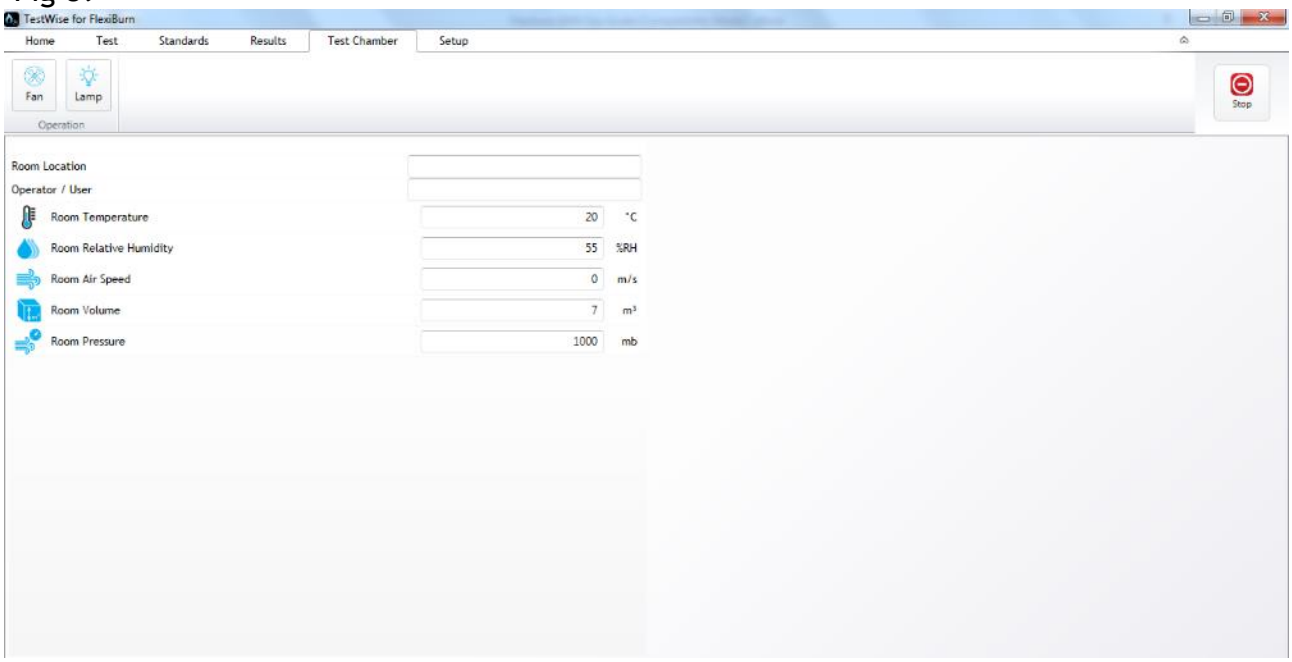
TEST CHAMBER PAGE

The test chamber paramaters are set to a default setting however they can be set to any parameters by simply clicking in the box and entering the required parameters.

Fans & lamps may be attached as ancillary devices in the corresponding sockets at the back of the frame.

They can be switced on and off here within the Test Chamber Menu (fig 89), and on the Settings Menu page under ‘Ancillary Equipment’ and also on the live Test Pages.

Fig 89



SETUP PAGE

The Setup Menu (fig 90) allows for the operator to move the burner manually, change some parameters, add test sheet information and attach ancillary equipment. Engineers also use this page to calibrate the burner angle settings.

Selecting 'Settings' at the top left of the page will show a box centrally on the page which opens in the 'Results' sub page (fig 91). This page allows the operator to state what details will be displayed on the test results page including the addition of a page header image.

Select the 'General' sub page and Communication Port can be selected, available text language chosen & a Statement section where comments can be placed which will appear on the final test results sheet.

The Burner Position is set here. This page is needed when setting the burner & flame position as each button when selected manually will take the burner to the selected position and thus allow the operator to set the carriage at the correct position.

The Home button will allow the apparatus to reset & take the burner to its resting/start position.

The Ignition & 0° buttons are used when setting the flame height

There are two jog buttons – one to move the burner up & one for down.

Also found here are the Gas Connection Information Selectors which relate to which gas type is attached to which connector at the back of the apparatus.

The Ancillary Equipment box is where the lamp, fan & radiator peripherals are enabled.

The right hand portion of the screen is blank and for used use by the engineer and is password protected.

Thread sensor check

To determine if the thread sensors are working. Depress the thread sensor wires on the frame if they are working correctly the thread line will show purple (Fig 90).

Fig 90

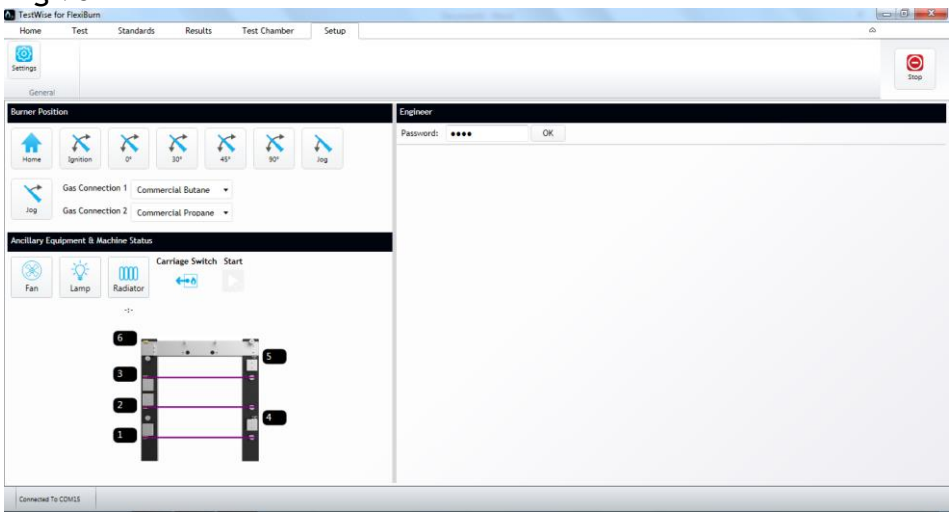
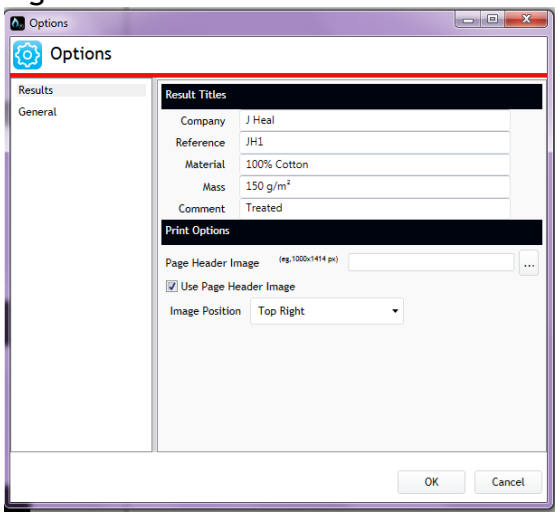

TestWise for FlexiBurn
Home
Test
Standards
Results
Test Chamber
Setup
Settings
General
Stop
Burner Position
Home
Ignition
0°
30°
45°
90°
Jog
Jog
Gas Connection 1
Commercial Butane
Gas Connection 2
Commercial Propane
Ancillary Equipment & Machine Status
Fan
Lamp
Radiator
Carriage Switch
Start
6
3
2
1
5
4
Engineer
Password:
OK
Connected To COM15

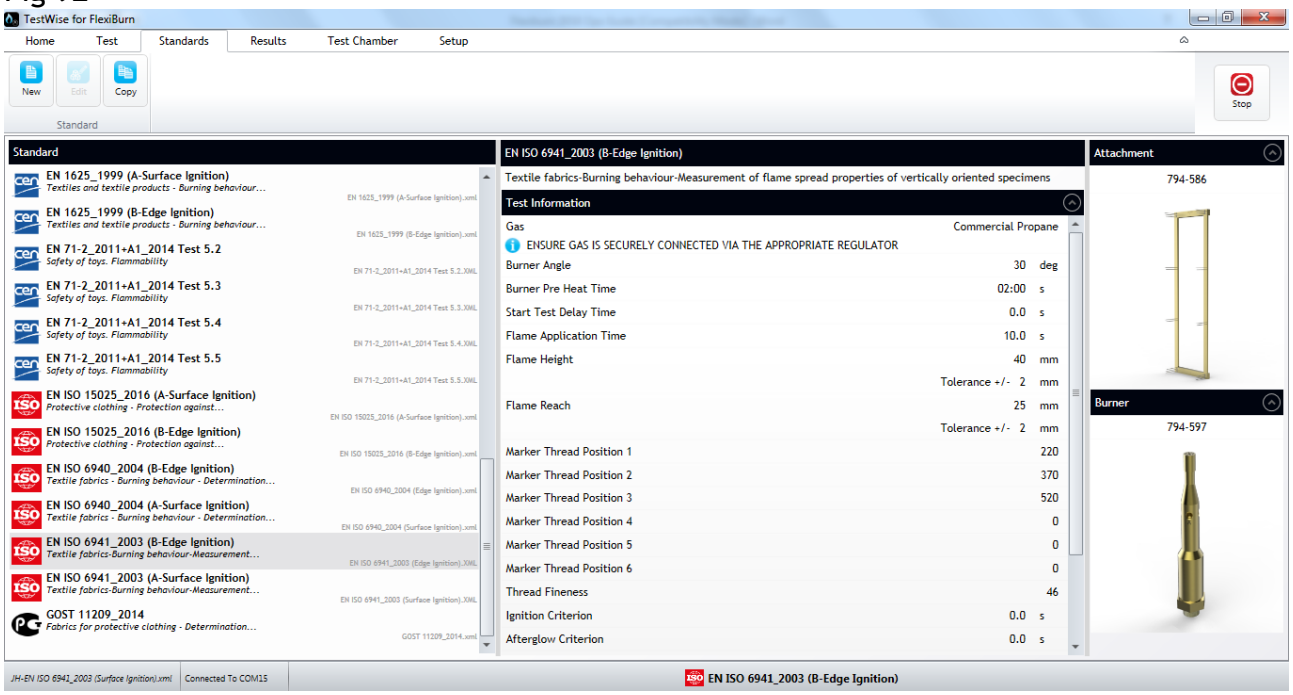
Fig 91


Options
Options
Results
General
Result Titles
Company
J Heal
Reference
JH1
Material
100% Cotton
Mass
150 g/m²
Comment
Treated
Print Options
Page Header Image
(eg.1000x1414 px)
Use Page Header Image
Image Position
Top Right
OK
Cancel

STANDARDS PAGE

The Standards Menu (fig 92) is used to create new and ammend existing tests to form new ones.

Fig 92



NEW STANDARD

To create a completely new test simply select ‘New’ icon at the top left of the screen and populate the test parameters page as required – where necessary typing over the default settings (fig 93) & click OK.

The ‘Save As’ box will then appear with the details placed in the ‘Name’ box on the Standard Description page in the ‘File Name’ box (fig 94).

This will then return the operator to the Standards Menu at the top of which can be found the newly created standard highlighted grey (fig 95).

Fig 93

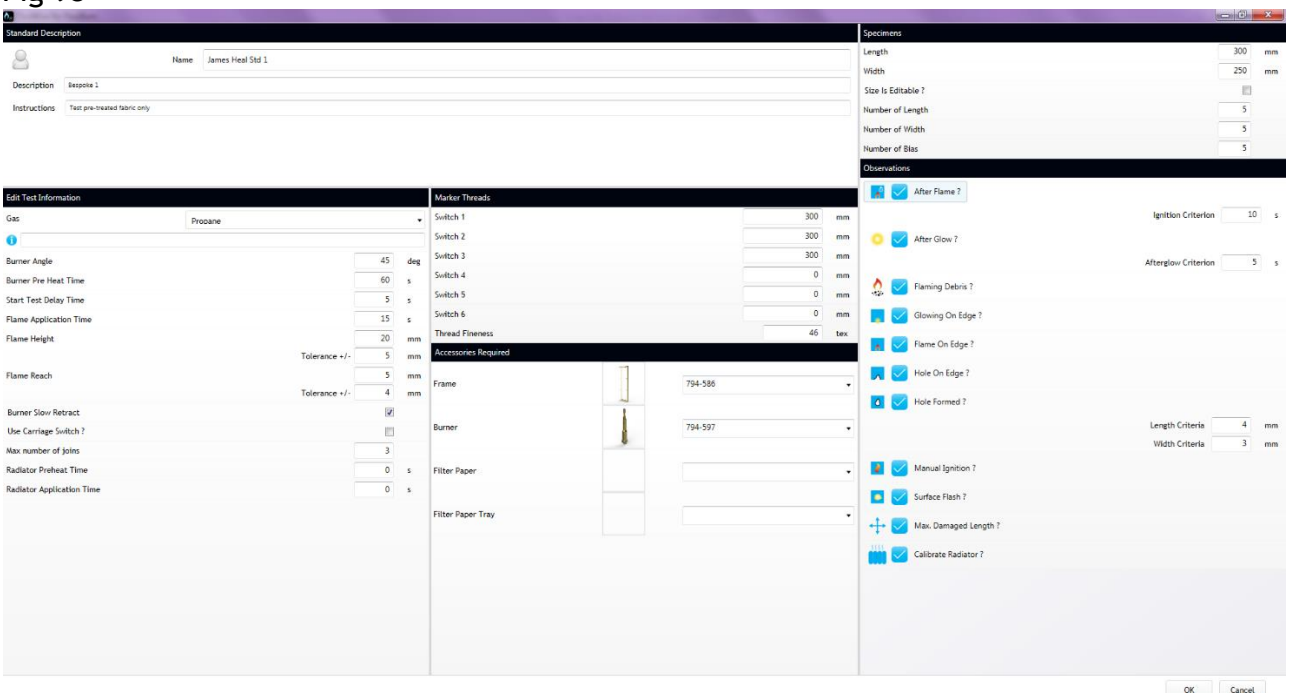

Standard Description
Name
James Heal Std 1
Description
Bespoke 1
Instructions
Test pre-treated fabric only
Specimens
Length
300
mm
Width
250
mm
Size Is Editable ?
Number of Length
5
Number of Width
5
Number of Bias
5
Observations
After Flame ?
Ignition Criterion
10
s
After Glow ?
Afterglow Criterion
5
s
Flaming Debris ?
Glowing On Edge ?
Flame On Edge ?
Hole On Edge ?
Hole Formed ?
Length Criteria
4
mm
Width Criteria
3
mm
Manual Ignition ?
Surface Flash ?
Max. Damaged Length ?
Calibrate Radiator ?
Edit Test Information
Gas
Propane
Burner Angle
45
deg
Burner Pre Heat Time
60
s
Start Test Delay Time
5
s
Flame Application Time
15
s
Flame Height
20
mm
Tolerance +/-
5
mm
Flame Reach
5
mm
Tolerance +/-
4
mm
Burner Slow Retract
Use Carriage Switch ?
Max number of joins
3
Radiator Preheat Time
0
s
Radiator Application Time
0
s
Marker Threads
Switch 1
300
mm
Switch 2
300
mm
Switch 3
300
mm
Switch 4
0
mm
Switch 5
0
mm
Switch 6
0
mm
Thread Fineness
46
tex
Accessories Required
Frame
794-586
Burner
794-597
Filter Paper
Filter Paper Tray
OK
Cancel

Fig 94

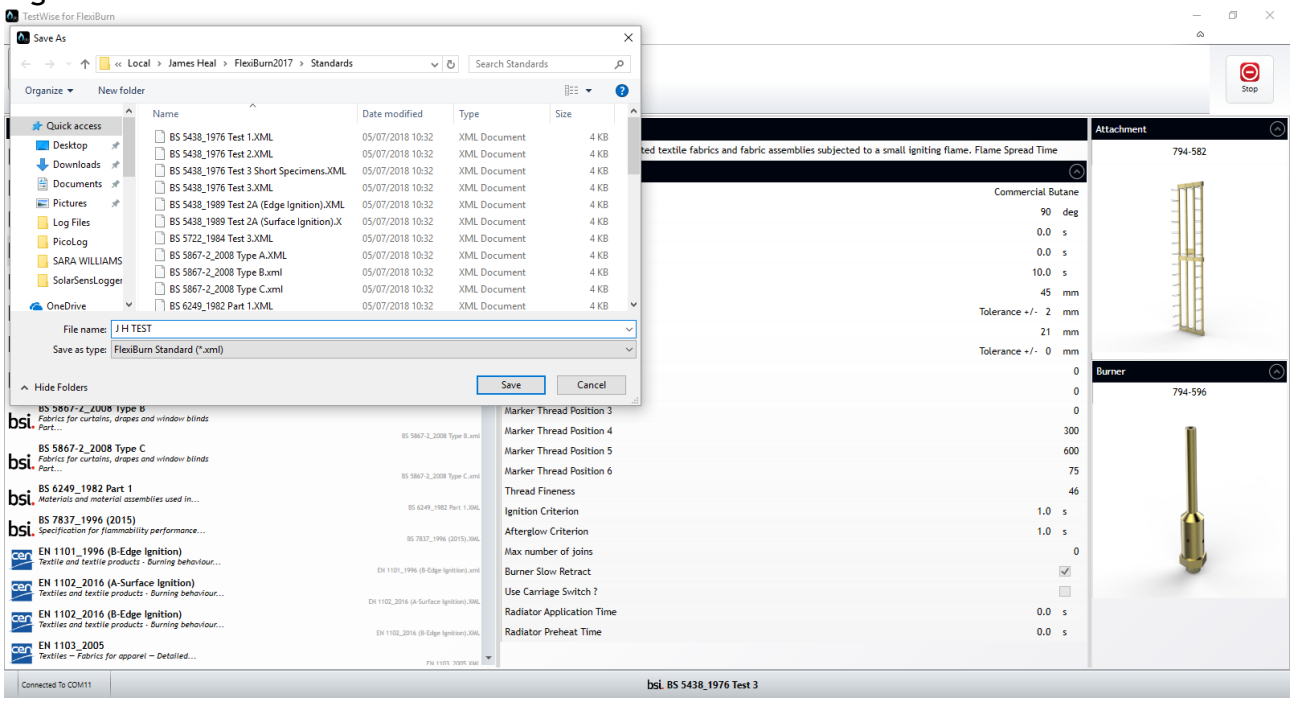
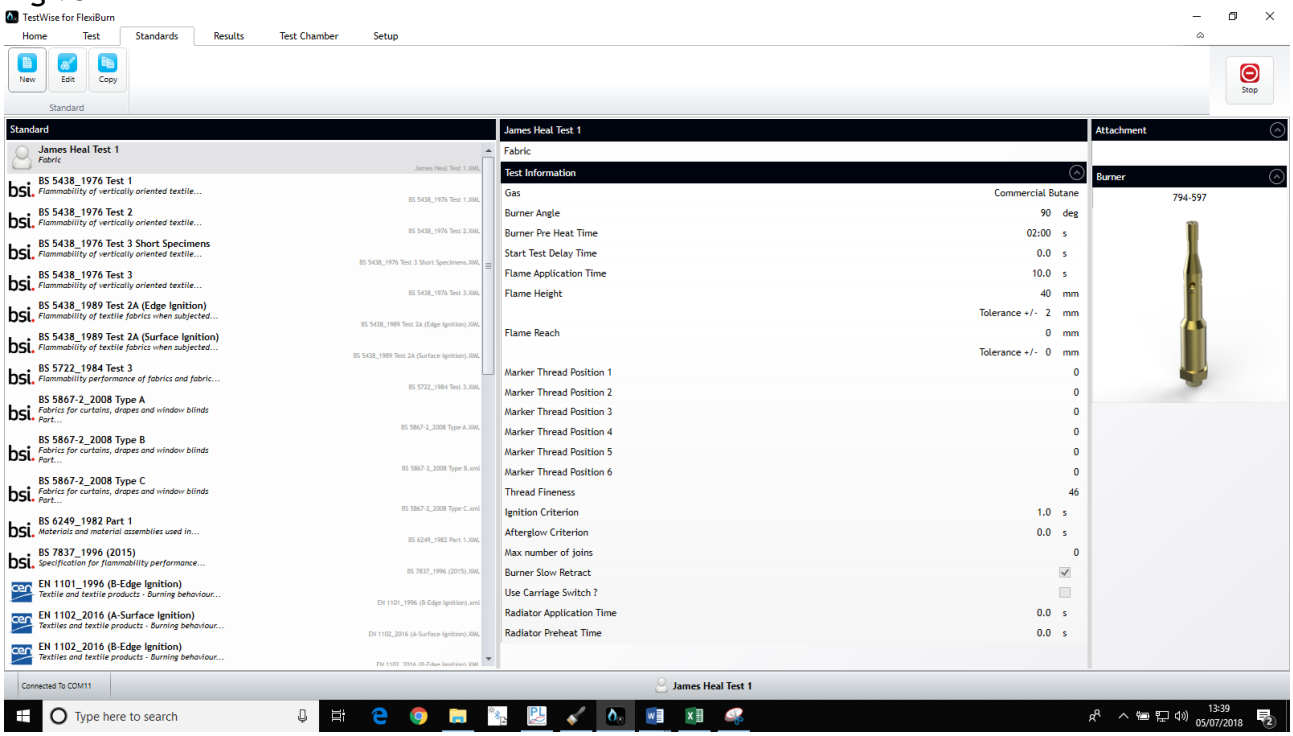

TestWise for FlexiBurn
Save As
Local
James Heal
FlexiBurn2017
Standards
Search Standards
Organize
New folder
Quick access
Desktop
Downloads
Documents
Pictures
Log Files
PicoLog
SARA WILLIAMS
SolarSensLogger
OneDrive
Name
Date modified
Type
Size
BS 5438_1976 Test 1.XML
BS 5438_1976 Test 2.XML
BS 5438_1976 Test 3 Short Specimens.XML
BS 5438_1976 Test 3.XML
BS 5438_1989 Test 2A (Edge Ignition).XML
BS 5438_1989 Test 2A (Surface Ignition).X
BS 5722_1984 Test 3.XML
BS 5867-2_2008 Type A.XML
BS 5867-2_2008 Type B.xml
BS 5867-2_2008 Type C.xml
BS 6249_1982 Part 1.XML
XML Document
4 KB
05/07/2018 10:32
File name:
J H TEST
Save as type:
FlexiBurn Standard (*.xml)
Hide Folders
Save
Cancel
Stop
Attachment
794-582
Burner
794-596
Commercial Butane
90 deg
0.0 s
0.0 s
10.0 s
45 mm
Tolerance +/- 2 mm
21 mm
Tolerance +/- 0 mm
Marker Thread Position 3
Marker Thread Position 4
300
Marker Thread Position 5
600
Marker Thread Position 6
75
Thread Fineness
46
Ignition Criterion
1.0 s
Afterglow Criterion
1.0 s
Max number of joins
0
Burner Slow Retract
Use Carriage Switch ?
Radiator Application Time
0.0 s
Radiator Preheat Time
0.0 s
BS 5867-2_2008 Type C
BS 6249_1982 Part 1
BS 7837_1996 (2015)
EN 1101_1996 (B-Edge Ignition)
EN 1102_2016 (A-Surface Ignition)
EN 1102_2016 (B-Edge Ignition)
EN 1103_2005
Connected To COM11
BS 5438_1976 Test 3

Fig 95



Results can be saved or printed by selecting the save or print icon adjacent to the blue ‘Open’ selector on the top left of the screen.

EDIT STANDARD

To edit any user created standard - highlight the required test (fig 96), select the 'Edit' button – the Standard Test Parameters page (fig 97) will appear on screen & change the parameters as required.

Fig 96

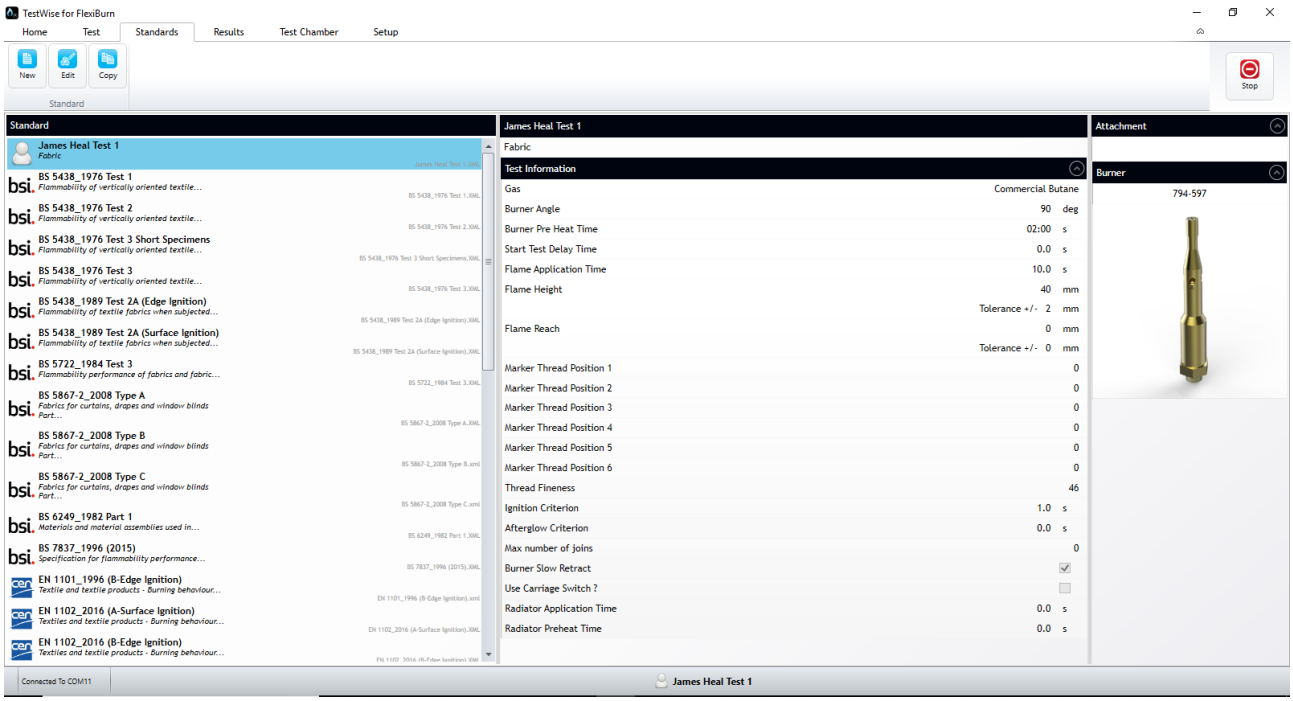
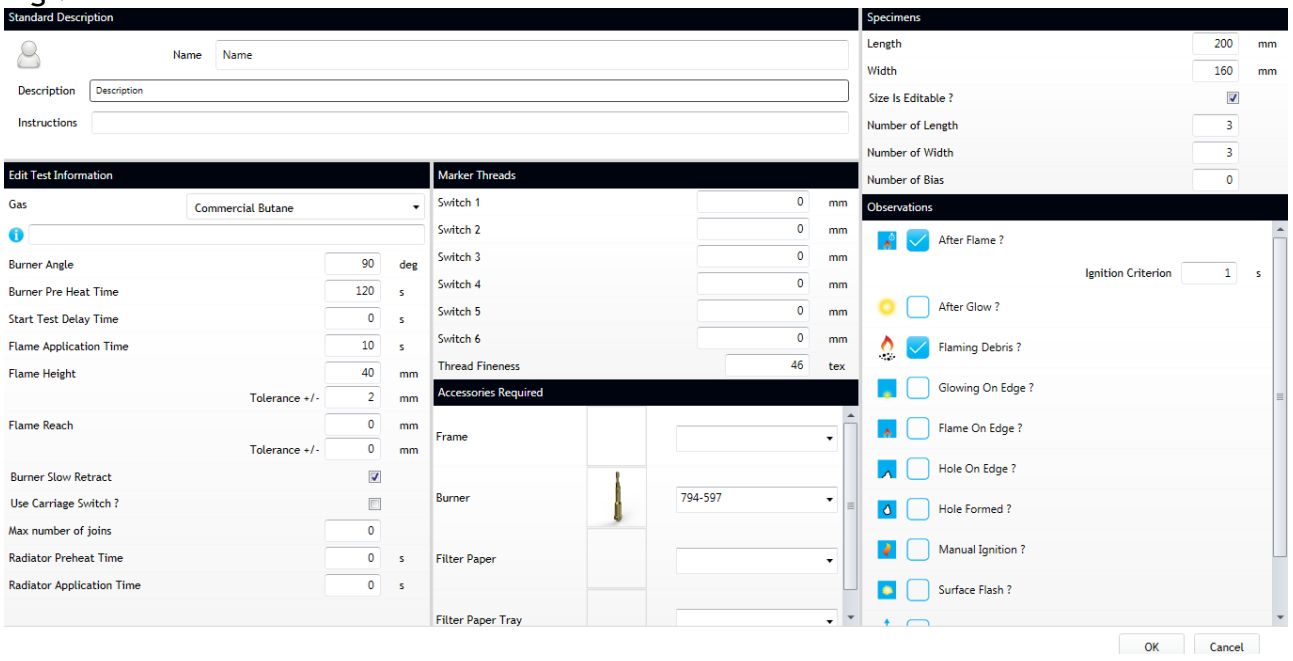


Fig 97



COPY STANDARD

If a standard is to be produced similar to an existing one - highlight the existing standard required & select the ‘Copy’ button. The ‘Enter Standard Description’ box will appear centrally where the Name & Description can be edited (fig 98). Select OK and the copy will be saved and appear at the top of the Standard with the corresponding test details on the left (fig 99). The copied standard can now be selected & edited.

Fig 98

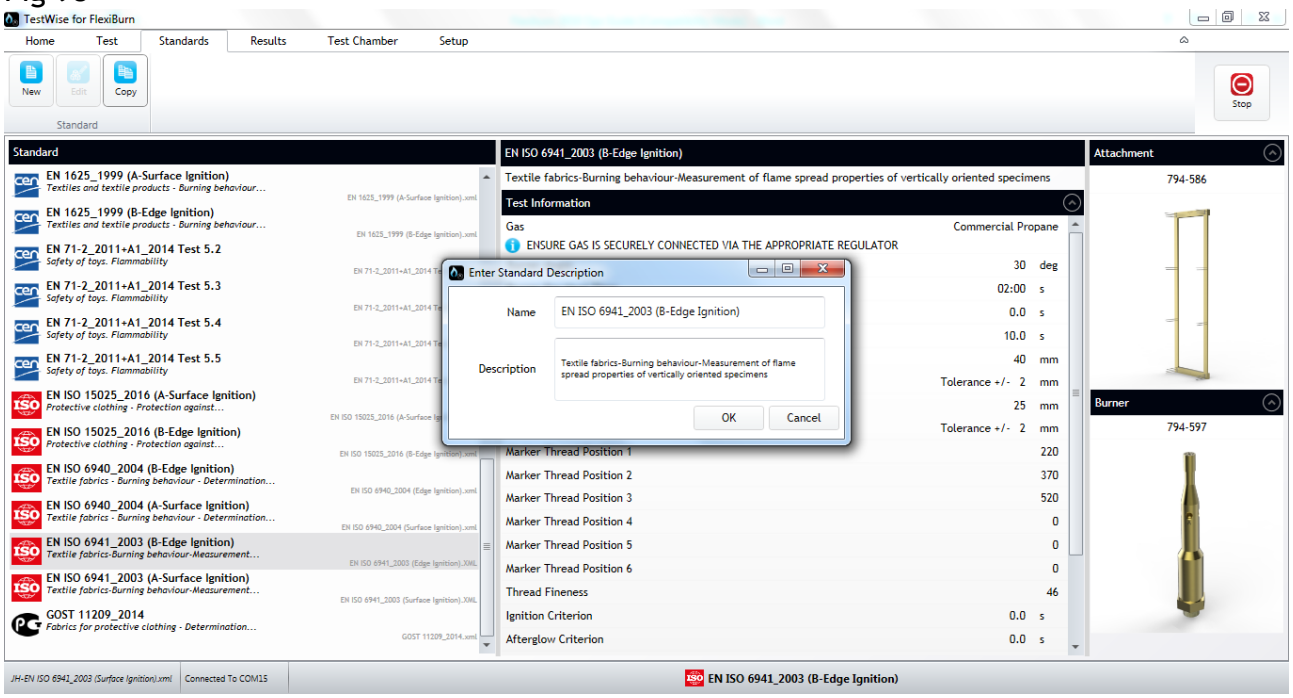
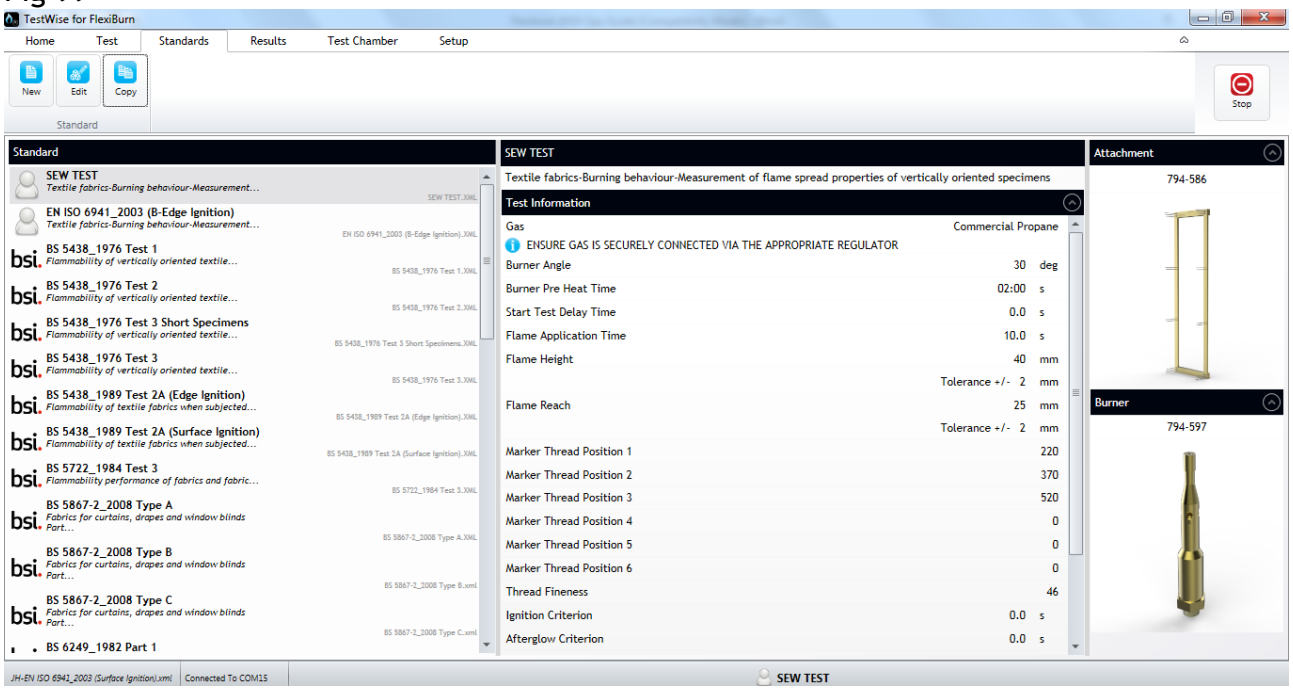


Fig 99



CHANGING THE BURNER

To change the burner take out the burner tool from its housing on the front left of the frame place fully over the burner and unscrew to loosen (figs 100 to 103). Once loosened, remove tool and unscrew the remainder of the way by hand and lift being careful not to loose rubber ‘o’ ring from round the bottom of the burner.

Replace the new burner by hand ensuring the rubber ‘o’ ring is placed loosely around the bottom of the burner, screw in by hand & tighten using the burner tool ensuring not to use too much force & over tighten.

Fig 100

Fig 101

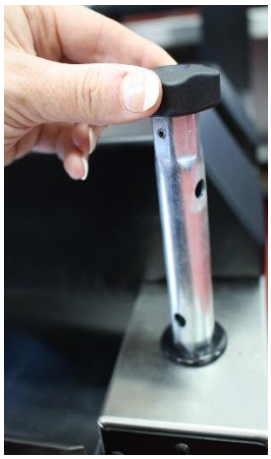
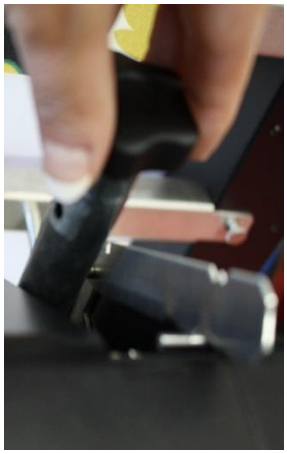


Fig 102

Fig 103



CAUTION!

ALWAYS CHANGE THE BURNER WHEN COLD

THE FLEXIBURN PRODUCES A NAKED FLAME: EXCERSISE CAUTION WHEN OPERATING THE APPARATUS TAKING ALL REASONABLE MEASURES TO AVOID INJURY - ENSURE NO LOOSE CLOTHING IS WORN WHEN OPERATING & LONG HAIR IS TIED BACK.

DO NOT TOUCH THE BURNER AT ANY TIME WHILST THE FLAME IS LIT OR IMMEDIATELY AFTER USE.

WHEN CHANGING THE BURNER ALWAYS ALLOW ENOUGH TIME FOR IT TO BECOME COMPLETELY COLD BEFORE CHANGING IF IT HAS RECENTLY BEEN LIT.

TOY TESTING WITH FLEXIBURN

The Toy Cage and 45 degree Test Frame have been specially developed for testing toys according to EN 71-2 Safety of toys – Flammability. These are available as optional accessories and are supplied complete with CD containing the appropriate software. Instructions for installing software is supplied with the CD.

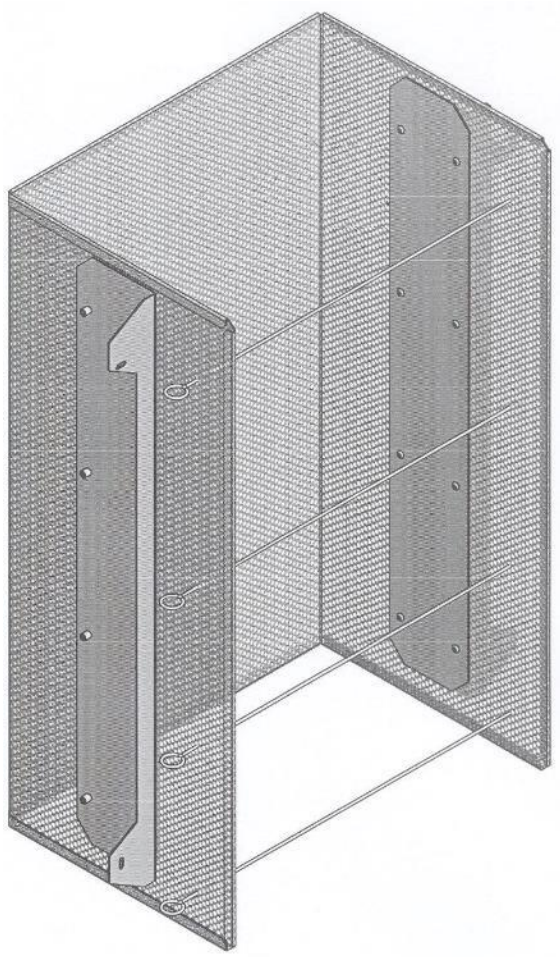


Fig 104. Toy Cage with skewers

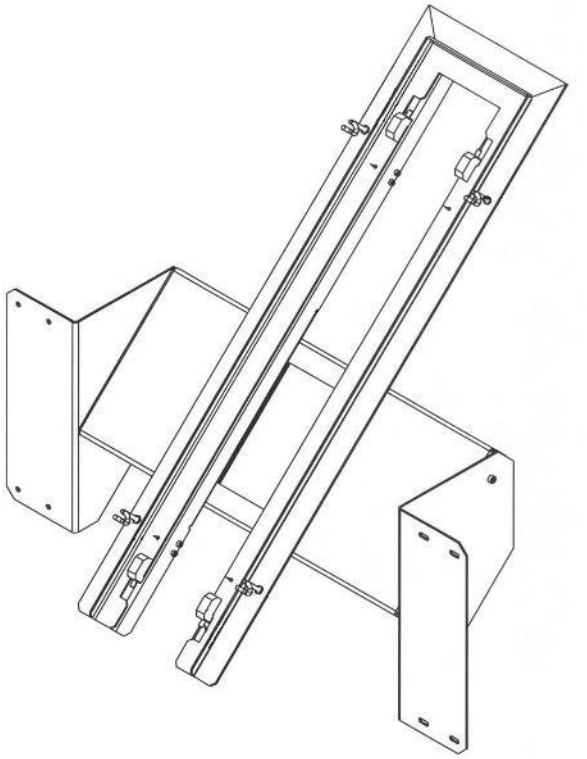


Fig 105. 45 degree Test Frame

EN71-2 describes five (5) test methods: Tests 5.2, 5.3 and 5.5 use the Toy Cage, while Test 5.4 employs the 45 degree Test Frame. Test 5.6, toys with a maximum dimension greater than 520mm, cannot be carried out using FlexiBurn.

Tests carried out in the Toy Cage are ignitability tests. Test 5.4, using the 45 degree Test Frame, is used to measure the rate of flame spread and utilises two (2) marker trip threads linked to timing devices to accomplish this.

The 45 degree Test Frame is fixed with eight (8) screws and the Toy Cage is fixed with just four (4) screws.

Before fitting either the Toy Cage or 45 degree Test Frame, all the support struts must be removed to provide space for the toy accessories.

Health & Safety Warning
Due to the bulk and weight of the Toy Cage and 45 degree Test Frame, they must be installed and uninstalled by two (2) people. The toy testing accessories are too heavy for one (1) person. Attempting to fit them alone is likely to result in damage to person and/or instrument.

Figure 106: Fitting the Toy Cage (above)

To fit the Toy Cage into the FlexiBurn:

- Remove all of the support struts.
- Pull the burner back as far as it will go and move to the “down” position.
- Fold the flame height indicator scale down so that it is not damaged.
- Using two (2) people, one on either side of the FlexiBurn, lift the Toy Cage over the burner arm and fit the four (4) holding screws, as shown in Figure 106.
- Secure the toy using one (1) or more skewers.
- Move the burner into the test position and reposition the toy if required.
- The burner arm can be in the “up” or “down” position, whichever is the more convenient.

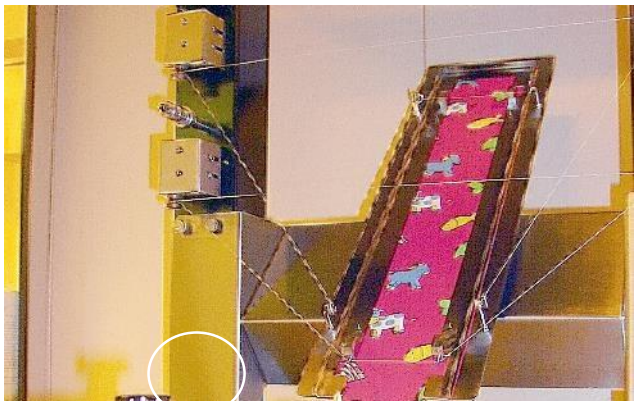


Figure 107: Fitting the 45 degree Test Frame (above)

To fit the 45 degree Test Frame into the FlexiBurn:

- Remove all of the support struts.
- Pull the burner back as far as it will go and move to the “down” position.
- Fold the flame height indicator scale down so that it is not damaged.
- Using two (2) people, one on either side of the FlexiBurn, lift the 45 degree Test Frame over the burner arm and fit the eight (8) holding screws, as shown in 107.

MARKER THREADS FOR TEST 5.4

Before setting up the marker threads, ensure the specimen is secured on the four (4) pins and under the U-shaped plate. Apply only slight tension to the specimen to ensure it is straight.

Two (2) marker threads are used to measure the rate of flame spread. One at 50mm from the lower edge of the specimen and the other 550mm from the lower edge of the specimen. These are linked to MT1 and MT2 timers.

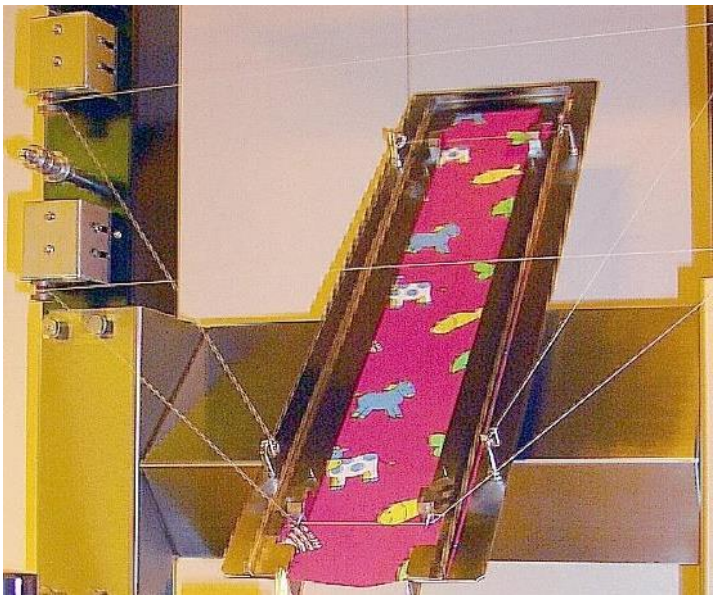


Figure 108: Marker thread arrangements for Test 5.4

CARRYING OUT THE TOY TESTS

EN71-2 describes five (5) test methods: Tests 5.2, 5.3 and 5.5 use the Toy Cage, while Test 5.4 employs the 45 degree Test Frame. Test 5.6, toys with a maximum dimension greater than 520mm, cannot be carried out using FlexiBurn.

Test	*Toy Cage or 45 degree Test Frame*	*Flame height (mm)*	*Flame application time (s)*	*Burner orientation (degrees)*	*Distance from burner tip to specimen (mm)*
5.2	Cage	20 ± 2	2 ± 0.5	0 (vertical)	10 approx.
5.3	Cage	20 ± 2	5 ± 0.5	45	5 approx.
5.5	Cage	20 ± 2	3 ± 0.5	45	5 approx.
5.4	Frame	40 ± 3	10 ± 1	0 (vertical)	30 ± 2

Table 1: Some Toy Testing parameters

When the burner is to be applied at 45 degrees (Tests 5.3 and 5.5), push the burner **forward** and set the correct distance between the burner tip and the specimen. Ignite the gas and press START to begin the test. The burner preheat time starts, after which the burner moves to 45 degrees and applies the flame to the specimen for the specified duration. Make the required observations.

When the burner is to be applied in the vertical position (zero degrees) (Tests 5.2 and 5.4), the test procedure is slightly different to above. Set the correct distance between the burner tip and the specimen. Retract the burner **backward**, ignite the gas and press START to begin the test. The burner preheat time starts. You must now re-enter the Test Chamber and push the burner forward to the application position. At the same time the flame application timer will start. Remove yourself immediately from the room and make the required observations. If you are performing Test 5.4, the marker thread timers will operate.

LIST OF STANDARDS

The following is a list of standards stored in TestWise as part of the FlexiBurn package. Other standards can be added on a bespoke basis by **James Heal** or the user create new or amend stored standards to suit their own needs. Any amendments to standards which affect the test procedure and with reference to the FlexiBurn apparatus can be sent via e-mail and uploaded to the TestWise software.

When a standard refers to a test as ~A, it means a surface test.
When a standard refers to a test as ~B, it means an edge test.

Some tests may also refer to different size specimens, please ensure the correct specimen size is selected.

Some standards may have more than one (1) issue current. Please ensure you select the correct year of issue. TestWise can store an infinite amount of standards.

	FLEXIBURN STANDARDS	
STANDARD	STANDARD TITLE	GAS (NOT SUPPLIED)
BS 5438_1976 Test 1	Flammability of vertically oriented textile fabrics and fabric assemblies subjected to a small igniting flame. Minimum Ignition Time	Commercial Butane
BS 5438_1976 Test 2	Flammability of vertically oriented textile fabrics and fabric assemblies subjected to a small igniting flame. Limited Flame Spread	Commercial Butane
BS 5438_1976 Test 3 Short Specimens	Flammability of vertically oriented textile fabrics and fabric assemblies subjected to a small igniting flame. Flame Spread Time	Commercial Butane
BS 5438_1976 Test 3	Flammability of vertically oriented textile fabrics and fabric assemblies subjected to a small igniting flame. Flame Spread Time	Commercial Butane
BS 5438_1989 Test 2A (Edge Ignition)	Flammability of textile fabrics when subjected to a small igniting flame applied to the edge or surface of vertically oriented specimens. Limited flame spread	Commercial Butane

STANDARD	STANDARD TITLE	GAS (NOT SUPPLIED)
BS 5438_1989 Test 2A (Surface Ignition)	Flammability of textile fabrics when subjected to a small igniting flame applied to the edge or surface of vertically oriented specimens. Limited flame spread	Commercial Butane
BS 5722_1984 Test 3	Flammability performance of fabrics and fabric assemblies used in sleepwear and dressing gowns	Commercial Butane
BS 5867-2_2008 Type A	Fabrics for curtains, drapes and window blinds Part 2: Flammability requirements - Specification	Commercial Propane
BS 5867-2_2008 Type B	Fabrics for curtains, drapes and window blindsPart 2: Flammability requirements - Specification	Commercial Propane
BS 5867-2_2008 Type C	Fabrics for curtains, drapes and window blinds Part 2: Flammability requirements - Specification	Commercial Propane
BS 6249_1982 Part 1	Materials and material assemblies used in clothing for protection against heat and flame. Specification for flammability testing and performance.	Commercial Butane
BS 7837_1996 (2015)	Specification for flammability performance for textiles used in the construction of marquees and similar textile structures	Commercial Butane
EN 71-2_2011+A1_2014 Test 5.2	Safety of toys. Flammability	Commercial Propane
EN 71-2_2011+A1_2014 Test 5.3	Safety of toys. Flammability	Commercial Propane
EN 71-2_2011+A1_2014 Test 5.4	Safety of toys. Flammability	Commercial Propane
EN 71-2_2011+A1_2014 Test 5.5	Safety of toys. Flammability	Commercial Propane

STANDARD	STANDARD TITLE	GAS (NOT SUPPLIED)
EN 1101_1996 (A-Surface Ignition)	Textile and textile products - Burning behaviour - Curtains and drapes - Detailed procedure to determine the ignitability of vertically oriented specimens (small flame)	Commercial Propane
EN 1101_1996 (B-Edge Ignition)	Textile and textile products - Burning behaviour - Curtains and drapes - Detailed procedure to determine the ignitability of vertically oriented specimens (small flame)	Commercial Propane
EN 1102_2016 (A-Surface Ignition)	Textiles and textile products - Burning behaviour -Curtains and drapes - Detailed procedure to determine theflame spread of vertically oriented specimens	Commercial Propane
EN 1102_2016 (B-Edge Ignition)	Textiles and textile products - Burning behaviour - Curtains and drapes - Detailed procedure to determine the flame spread of vertically oriented specimens	Commercial Propane
EN 1103_2005	Textiles — Fabrics for apparel — Detailed procedure to determine the burning behaviour	Commercial Propane
EN 1624_1999 (A-Surface Ignition)	Textiles and textile products - Burning behaviour of industrial and technical textiles - Procedure to determine the flame spread of vertically oriented specimens	Commercial Propane
EN 1624_1999 (B-Edge Ignition)	Textiles and textile products - Burning behaviour of industrial and technical textiles - Procedure to determine the flame spread of vertically oriented specimens	Commercial Propane
EN 1625_1999 (A-Surface Ignition)	Textiles and textile products - Burning behaviour of industrial and technical textiles - Procedure to determine the ignitability of vertically oriented specimens	Commercial Propane
EN 1625_1999 (B-Edge Ignition)	Textiles and textile products - Burning behaviour of industrial and technical textiles - Procedure to determine the ignitability of vertically oriented specimens	Commercial Propane

STANDARD	STANDARD TITLE	GAS (NOT SUPPLIED)
EN 13772_2011	Textiles and textile products - Burning behaviour - Curtains and drapes - Measurement of flame spread of vertically oriented specimens with large ignition source	Commercial Propane
EN 14878_2007	Textiles - Burning behaviour of children's nightwear - Specification	Commercial Propane
EN ISO 6940_2004 (B-Edge Ignition)	Textile fabrics - Burning behaviour - Determination of ease of ignition of vertically oriented specimens	Commercial Propane
EN ISO 6940_2004 (A-Surface Ignition)	Textile fabrics - Burning behaviour - Determination of ease of ignition of vertically oriented specimens	Commercial Propane
EN ISO 6941_2003 (B-Edge Ignition)	Textile fabrics-Burning behaviour-Measurement of flame spread properties of vertically oriented specimens	Commercial Propane
EN ISO 6941_2003 (A-Surface Ignition)	Textile fabrics-Burning behaviour-Measurement of flame spread properties of vertically oriented specimens	Commercial Propane
EN ISO 15025_2016 (A-Surface Ignition)	Protective clothing - Protection against flame - Method of test for limited flame spread	Commercial Propane
EN ISO 15025_2016 (B-Edge Ignition)	Protective clothing - Protection against flame - Method of test for limited flame spread	Commercial Propane
GOST 11209_2014	Fabrics for protective clothing - Determination of fire resistance	Commercial Propane

GLOSSARY OF TERMS USED IN THE FLAMMABILITY TESTING OF TEXTILES

For a more comprehensive list of terms and definitions used in the description of the burning behaviour of textiles and textile products see ISO 4880.

AFTERFLAME
Persistence of flaming of a material, under specified test conditions, after the ignition source has been removed.

AFTERFLAME TIME
DURATION OF FLAME
Length of time for which a material continues to flame, under specified test conditions, after the ignition source has been removed. Expressed in seconds.

AFTERGLOW
Persistence of glowing of a material after cessation of flaming, under specified test conditions, or, if no flaming occurs, after the ignition source has been removed.

AFTERGLOW TIME
DURATION OF AFTERGLOW
Self-extinguishability (deprecated).
Self-extinguishing (deprecated).
Length of time for which a material continues to glow, under specified test conditions, after cessation of flaming or after the ignition source has been removed. Expressed in seconds.

BURN, intransitive verb
Undergo combustion.

BURNED AREA
That part of the damaged area of a material that has been destroyed by combustion or pyrolysis, under
specified test conditions. Expressed in square metres. (cf. damaged area).

COMBUSTION
Exothermic reaction of a combustible substance with an oxidiser, accompanied by flames and/or glowing and/or emission of smoke.

CHAR, noun
Carbonaceous residue resulting from pyrolysis or incomplete combustion.

CHAR, verb
Form carbonaceous residue during pyrolysis or incomplete combustion.

COMBUSTIBLE, adjective
Capable of burning.

COMBUSTION
Exothermic reaction of a combustible substance with an oxidiser, accompanied by flames and/or glowing and/or emission of smoke.

DAMAGED AREA
Total of the areas of a material permanently affected by thermal phenomena under specified test conditions:
loss of material, shrinking, softening, melting, charring, combustion, pyrolysis, etc.
Expressed in square centimetres. (cf. burned area).

DAMAGED LENGTH
Char length (deprecated).
Maximum extent, in a specified direction, of the damaged area of a material under specified test conditions. Expressed in centimetres. In some standards, char length is defined by a specific test method.

EASE OF IGNITION
Ease with which a material can be ignited under specified test conditions. (cf. minimum ignition time).

FLAME, noun
Zone of combustion in the gaseous phase from which light is emitted.

FLAME, verb
Undergo combustion in the gaseous phase with emission of light.

FLAME SPREAD
Propagation of a flame front.

FLEXIBURN
Multi-purpose vertical flammability tester for textiles and textile products.
Successor to the Rhoburn vertical flammability tester.
Manufactured by James H. Heal & Co. Ltd., Halifax, England.

RATE OF FLAME SPREAD
Burning rate (deprecated).
Rate of burning (deprecated).
Distance travelled per unit time, under specified test conditions, by a flame front during its propagation. Expressed in metres per second.

FLAME SPREAD TIME
time taken by a flame on a burning material to travel over a specified distance or surface area under specified test conditions. Expressed in seconds.

HEAT FLUX
DENSITY OF HEAT FLOW RATE
Thermal intensity, indicated by the rate at which heat crosses a given surface per unit area of that surface. Expressed in watts per square centimetre or kilowatts per square metre.

IGNITION
Initiation of combustion.

MELT DRIP, noun
Flaming debris (deprecated).
Falling droplets of molten material, either burning or not.

MINIMUM IGNITION TIME
Minimum time of exposure of a material to an ignition source to obtain sustained combustion under specified test conditions. Expressed in seconds.

SMOKE
Visible suspension of solid and/or liquid particles in gases resulting from combustion or pyrolysis.

SMOULDERING
Slow combustion of a material without light being visible and generally evidenced by an increase in temperature and/or by smoke.

SURFACE FLASH
Rapid spread of flame over the surface of a material without ignition of its basic structure. However, if the latter occurs simultaneously or sequentially with surface flash, it is not considered as a part of surface flash.