



OPERATOR'S GUIDE

FlexiFrame

Stretch & Recovery
Instrument

Model 1511

Serial Numbers
1511/15/1001 and
upwards

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

Setting the Standard



Publication 290-1511-1\$B
©2016

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 Properties

- 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

FLEXIFRAME STRETCH & RECOVERY TESTER

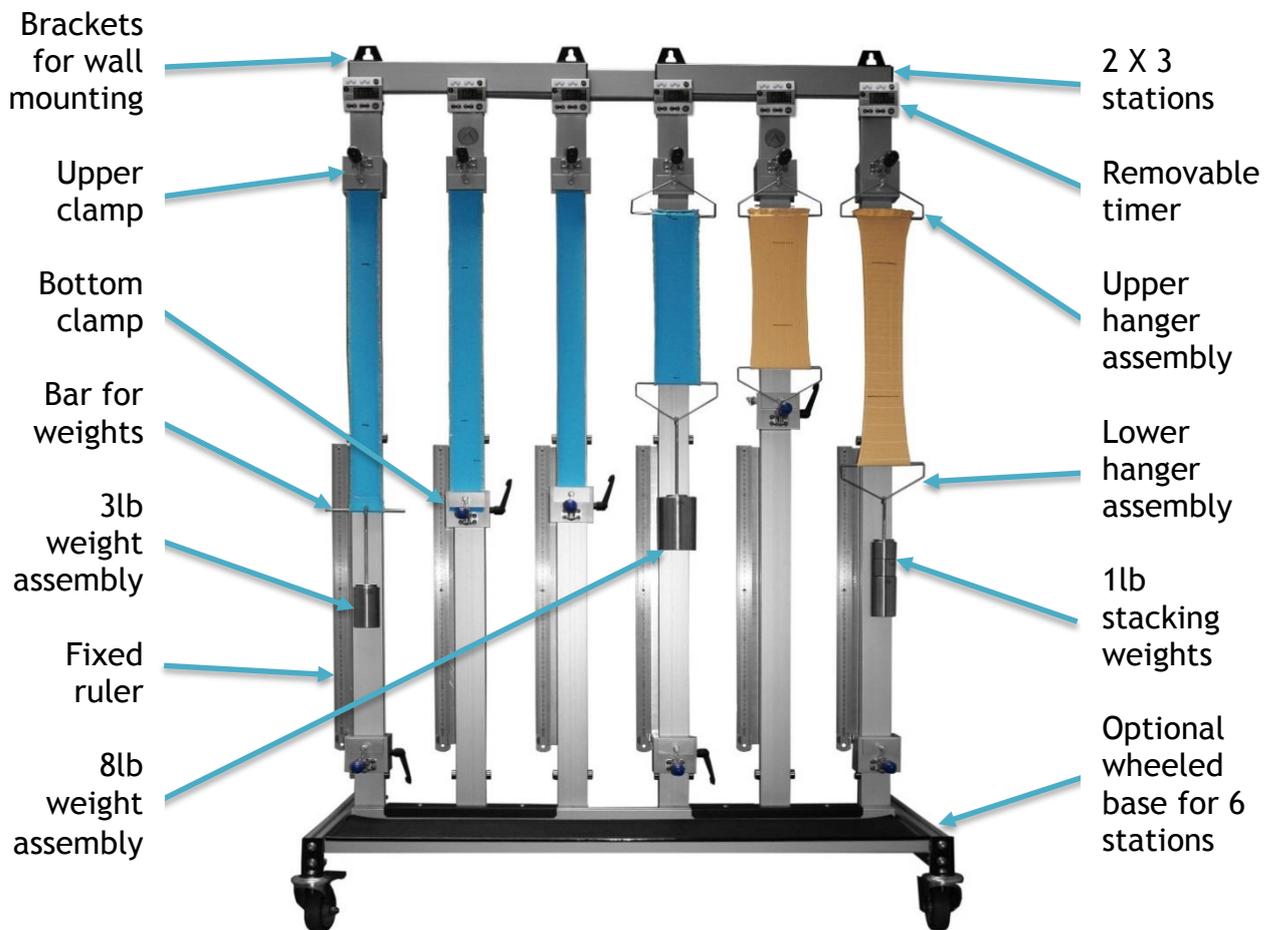
FlexiFrame is the first stretch and recovery instrument from James Heal. This quality instrument has been designed and produced completely with the user in mind.

We have combined James Heal's technical and performance expertise with intuitive design and operation to produce an ergonomic and user friendly stretch and recovery instrument.

Features & Benefits

- Available as a 3 station wall mounted instrument, or a 6 station with a wheeled base
- Complete flexibility as multiple test methods can be carried out on each of the stations using the available clamps, rods and hangers
- Instrumental repeatability is guaranteed as FlexiFrame is fully calibratable
- Mobile yet sturdy construction
- The wheeled base also provides a handy storage area
- Bespoke measuring devices available
- 18 months warranty
- Applications support
- Engineering support
- Operator training is available through James Heal

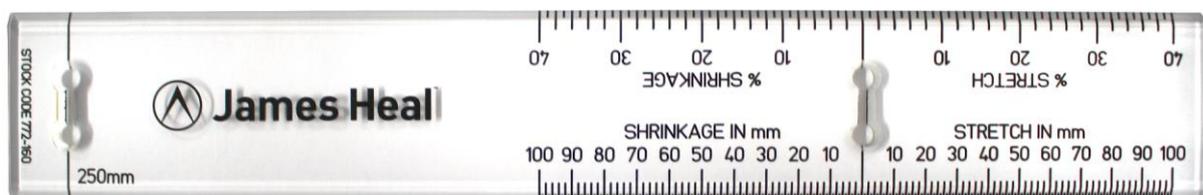
Features of FlexiFrame



Dimensional Stability Ruler

The 250mm dimensional stability ruler developed at James Heal can be used for creating gauge marks and for measuring dimensional change in millimetres or percentage. It may be used for the following test methods:

- ASTM D3107
- Ralph Lauren



Scope of Application

Stretch, growth and recovery can be determined for both woven and knitted materials on [FlexiFrame](#).

[FlexiFrame](#) complies fully with the requirements of **ASTM D3107** - Stretch Properties of Fabrics Woven from Stretch Yarns, and **ASTM D2594** - Stretch Properties of Knitted Fabrics Having Low Power.

Part ii of **Arcadia AG31** - Residual Extension of Woven Fabrics Containing Elastanes, can be performed on [FlexiFrame](#). James Heal also offer Titan - a universal Strength Tester - to fulfil the requirements of Part i. Please contact us for further details.

The **Ralph Lauren** Test Method for Stretch Properties of Fabrics Woven from Stretch Yarns, may also be performed on [FlexiFrame](#).

Standards Summary

[FlexiFrame](#) complies with the following standards:

- ASTM D3107
- ASTM D2594
- Arcadia AG 31 part ii)
- Ralph Lauren

Useful Definitions

Stretch Yarn - A synthetic filament or spun yarn which will stretch under tension and recover quickly upon release.

Stretch Woven Fabric - A woven fabric that is capable of $\geq 20\%$ stretch and recovers almost fully after stretching.

Fabric Stretch - Usually expressed as a percentage, it is the increase in length of a specimen after tension is applied.

Fabric Growth - Usually expressed as a percentage, it is the difference in length of a specimen before and after tension is applied and subsequently removed.

Fabric Recovery - Usually expressed as a percentage, it is fabric growth recovered after tension or extension has been applied, measured at specified intervals.

INSTALLATION

Safety

This instrument (without accessories) has a mass of approximately 16kg, therefore assistance from a colleague or suitable lifting apparatus is recommended.

Position **FlexiFrame** away from high traffic areas to avoid interference with testing.

It is recommended that **FlexiFrame** is serviced and calibrated annually by a James Heal Service and Calibration Engineer.

Never use **FlexiFrame** for anything other than what it is designed for.

The user may choose to wear safety shoes and to mark the footprint of the wall mounted **FlexiFrame** onto the floor in the event of the weights being dropped.

Unpacking

Remove the tape from the packing case lid and open. Carefully remove the packaging and contents from the packing case.

Note that any accessories ordered with the instrument are packed with the instrument. 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.

The 3 station frame comes ready assembled with wall brackets attached. Carefully lift the instrument and place it upright against a firm surface, or lay on the floor.

See assembly instructions for the 6 station instrument with the wheeled base.

Checklist

Wall Mounted FlexiFrame & Standard Accessories

Check the serial number plate to confirm that the instrument is in accordance with your order. Check the items listed in the tables below are present:

Item number	Item name	Quantity
904-551	<i>3-Station FlexiFrame</i>	1
297-034	FlexiFrame Operator's Guide disc	1
309-188	4 channel timer	3
316-896	Sticker sheet	2
381-413	4mm A/F hex key	1
381-524	10mm spanner	2
543-374	Solid bar hanger	3
543-372	Wire hanger	6
543-373	Roller for wire hanger	6

Wheeled Base FlexiFrame Additional Items

Item number	Item name	Quantity
904-555	<i>Wheeled based FlexiFrame</i>	
904-551	<i>3-Station FlexiFrame</i>	2
543-390	Assembled wheeled base with rubber mat	1
319-542	M8 x 10 SS hex SKT BUTT HD screw	22
319-543	M8 x 40 SS hex SKT BUTT HD screw (fit to spacers)	2
543-366	Spacer (fit to wheel base)	2
543-391	Clamp	2
543-392	Bridge	1
381-109	5mm A/F hex key	1
543-368	Web - RH	1
543-369	Web - LH	1

Accessories

Item number	Item name
201-996	ISO Calibration Certificate
543-380	1lb stacking weight
543-383	3lb weight assembly
543-384	8lb weight assembly
772-160	FlexiFrame dimensional stability ruler - 250mm gauge length
772-133	Steel ruler 300mm / 12 in
772-132	Steel ruler 600mm / 24 in

Spares

Item number	Item name
309-188	4 channel timer with an ISO 17025 A2LA traceable NIST cert
102-134	Battery for timer
543-372	Wire hanger
543-373	Roller for wire hanger
543-374	Bar for weight

Accessories per test - 3 Station Frame

	Weights			Hangers		
	543-383 3lb Weight Assembly	543-380 1lb Stacking Weight	543-384 8lb Weight Assembly	543-374 Bar for Weight	543-372 Wire Hanger	543-373 Roller for Wire Hanger
*ASTM D3107 (option 1) - default, with 4lb weight and solid bar hanger	3	3		3		
*ASTM D3107 (option 2) - if requested, with 3lb weight and solid bar hanger	3			3		
*ARCADIA AG31						
*Ralph Lauren			3		6	6
^ASTM D2594 with 5lb weight For loose fitting (comfort stretch) apparel fabrics	2	4			6	6
^ASTM D2594 with 10lb weight For form-fitting (semi support) apparel fabrics		4	2		6	6
^ASTM D2594 with both 5lb & 10lb weights	2	4	2		6	6
ALL 4 STANDARDS	3	4	3	3	6	6

*Woven
^Knitted

	Rulers		
	772-160 Dimensional stability ruler	772-133 Steel rule - 300mm	772-132 Steel rule - 600mm
ASTM D3107	1		
ARCADIA AG31 Part ii)			1
Ralph Lauren	1		
ASTM D2594		1	1

ASSEMBLY

FlexiFrame does not require any electrical, water or air supplies.

The edges of the jaws faces are set 500mm apart using the distance stoppers. The pointers should align with the top of the scale. If these have been moved, ensure they are re-aligned with zero before use (where required).

Wall Mounted FlexiFrame



FlexiFrame is available as a 3 station ready assembled unit. This may be mounted on the wall using the 2 brackets attached to the top of the instrument.

The type of fixings required will depend upon the type of wall. Please choose the most appropriate wall fixings for holding at least 30Kg.

Fasten the FlexiFrame at an ergonomic height appropriate for the intended user. The uppermost bracket should be around or above eye level.

Position the timers on their corresponding stations.

In the event of the weights being accidentally dropped, the user may choose to wear safety shoes and to mark the footprint of FlexiFrame onto the floor.

FlexiFrame is now ready to be set up for the chosen test method.

Wheeled Base FlexiFrame

FlexiFrame is available as a 6 station unit with a wheeled base. This comprises:

- 2X 3 station units
- wheeled base
- tools and accessories (see unpacking checklist)

It has a total weight of approximately 42Kg without additional weights.



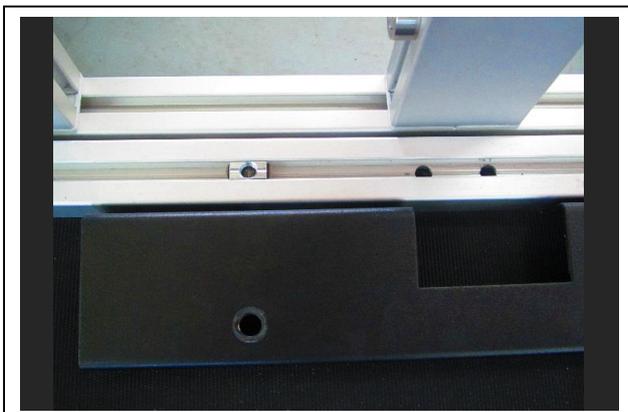
The wheeled base is already assembled - place this on the floor.

Prepare for the simple assembly of the 6 station unit by spreading all accessories onto the base.

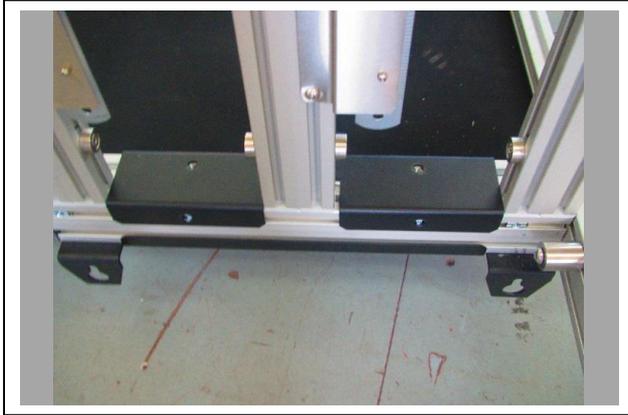


With the frames and base facing you, choose the frame which has the bottom left end cap removed. Locate this into the left hand side in the wheeled base. Push down firmly until the unit sits flush inside the bottom black clamp.

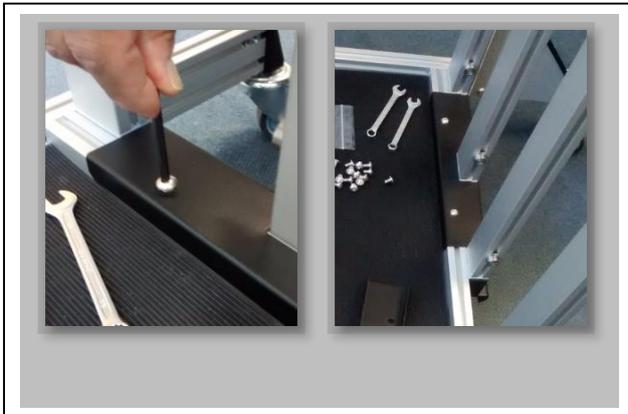
Using a rubber hammer gently tap the frame until it is completely positioned on the left hand side and the holes for the nuts are aligned.



Lay the top black clamp next to the frame and ensure that the sliding T nuts are in alignment with the holes in the clamp.



Place top black clamp over the bottom of the wheel base and gently tap with a rubber hammer to ensure that the holes on the top and sides are lined up for the nuts.



Fit the clamp over the join and screw down using short screws with the 5mm hex key.

There are 3 screws underneath the bottom black clamp that can be secured once the top clamp is in place

Repeat the above steps for the right hand side with the frame with the right hand cap removed.



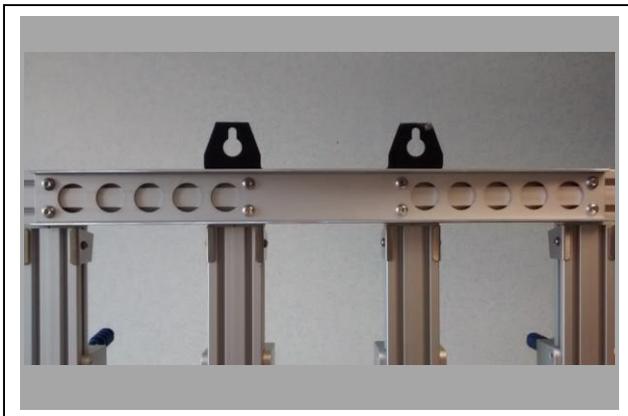
Space the left hand web away from the base using the spacers. Use the long screws and 5mm hex key to fasten onto the base.

Using the short screws, fasten to the frame with the 5mm hex key provided.



The right hand web fits flush with the edge of the frame and the edge of the base.

Position, then fasten using the short screws with the 5mm hex key provided.



Fasten the bridge onto the back of the 2 frames using 8 short screws with the 5mm hex key provided.



Position the timers on each of the corresponding stations.

Once [FlexiFrame](#) is placed in a safe working environment, it is ready for use.

OPERATION

Operator Safety

Read this manual thoroughly before operating the instrument.

FlexiFrame must be placed in a safe working environment away from heavy foot traffic.

In the event of the weights being accidentally dropped, the user may choose to wear safety shoes and to mark the footprint of FlexiFrame onto the floor.

Avoid placing fingers in the clamps.

Adjusting and Moving the Clamps

The top clamps are fixed to the column and do not move.

The bottom clamps can slide up and down the column between the 2 sets of stoppers. If required this lower clamp can also slide further upwards. Unlock the 2 upper stoppers with the 4mm hex key, slide up to the top of the column and relock. The clamp is now free to move up and down the whole length of the column.



The black levers lock the lower clamp in place.

To release, rotate the lever forwards and down.

The clamps can now move down to the lower stoppers.

Push the black levers upright to lock.



The top clamps are opened by lifting up the blue handle.

The bottom clamps are opened by pushing down on the blue handle.

Different sample thicknesses can be accommodated by adjusting the 2 nuts, using the spanners provided.

Summary of Test Procedures

Stretch Properties of Fabrics Woven from Stretch Yarns



ASTM D3107 - Stretch Properties of Fabrics Woven from Stretch Yarns consists of 2 parts - both of which are carried out on [FlexiFrame](#).

For part i) a seam is created to accommodate a bar from which either 3lb or 4lb weights are hung. The top of the specimen is held in the upper clamp. After cycling, the sample is hung at full extension and measured at intervals. The weight is then removed and the sample is again measured at intervals.

For part ii) the specimen is held in both the upper and lower clamps and then stretched to 85%, which is calculated from part i). A measurement is taken after a period of time, and then the specimen is released from the clamp and re-measured at intervals.

Fabric stretch, growth and recovery are then calculated from the various measurements.

The dimensional stability ruler from James Heal can be used for both applying the bench marks and for measuring the specimens.



Arcadia AG31 - Residual Extension of Woven Fabrics Containing Elastanes is a 2 part test with similarities to ASTM D3107.

The main difference between the 2 methods is that part i) is performed on a Constant Rate of Extension machine, for example Titan from James Heal.

The available stretch is found and 80% of available stretch calculated. This is also given in millimetres.

The specimen in part ii) is held in both the upper and lower **FlexiFrame** clamps. This is extended to 80% of available stretch using the scale attached to the instrument.

The specimen is then released from the clamp and after time is measured once, using a 600mm ruler.

The residual extension (%) is then calculated.



For the *Ralph Lauren Test Method for Stretch Properties of Fabrics Woven from Stretch Yarns*, specimens are sewn securely into loops of fabric.

These are then attached to FlexiFrame with a hanger through the upper clamp. Open the clamp and feed the hanger through to rest on the front bolt.

A second hanger is attached through the bottom of the specimen, from which an 8lb weight is hung.

Measurements are taken at intervals with and without the weights.

Fabric stretch and growth can then be calculated.

The dimensional stability ruler from James Heal can be used for both applying the bench marks and for measuring the specimens.

Stretch Properties of Knitted Fabrics



ASTM D2594 - Stretch Properties of Knitted Fabrics Having Low Power consists of 2 stages - both of which are carried out on FlexiFrame.

Each specimens for both stages of the method is sewn securely into a loop of fabric. They are then attached to FlexiFrame with a hanger through the upper clamp. To do this, open the clamp and feed the hanger through, and rest on the front bolt.

A second hanger is attached through the bottom of the specimens.

For stage 1, unlock the 2 lower clamp stoppers with the 4mm hex key, slide to the top of the grooves and relock. Slide the clamp up and feed the hanger through under the front bolt. Stretch to a pre-determined percentage for a given period of time. Remove the hanger and measure at intervals.

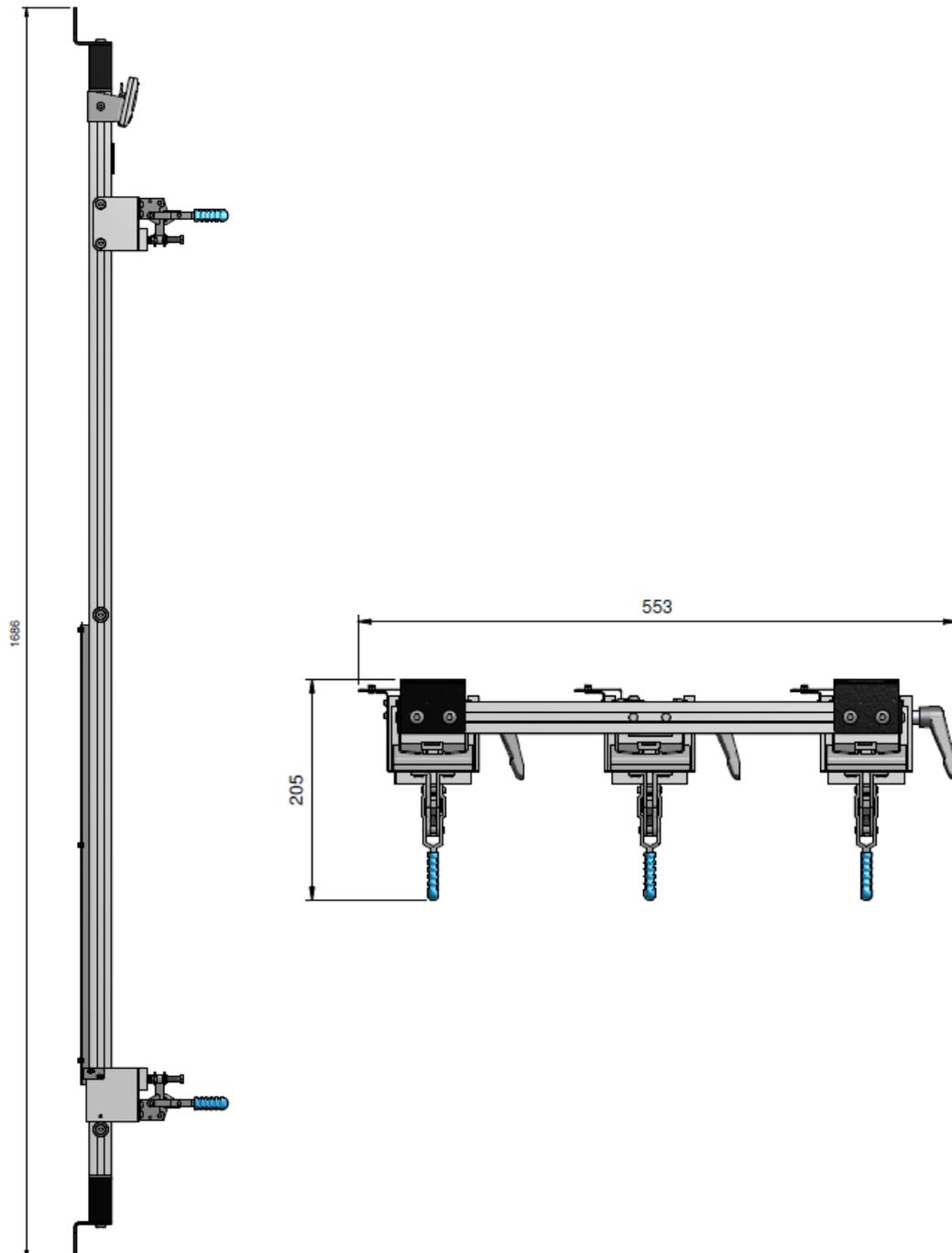
For stage 2, a 5lb or 10lb weight is hung from the lower clamp. The specimen is cycled and then hung at full extension and measured.

Fabric growth and stretch properties are calculated.

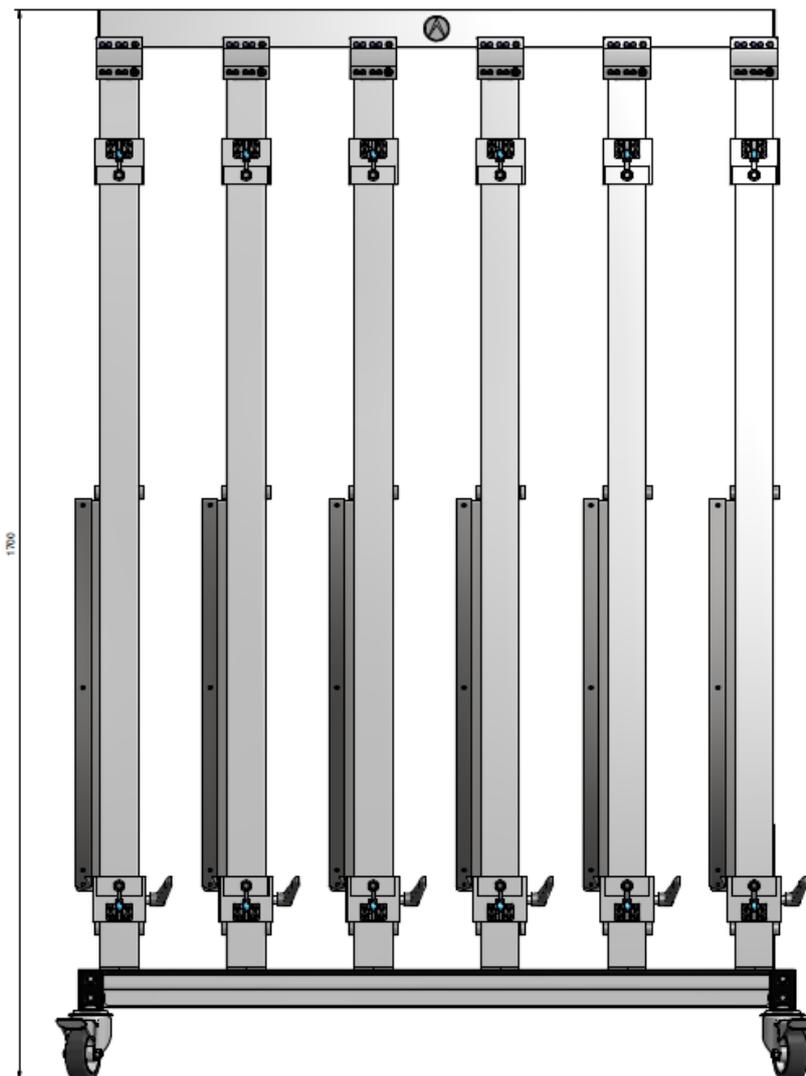
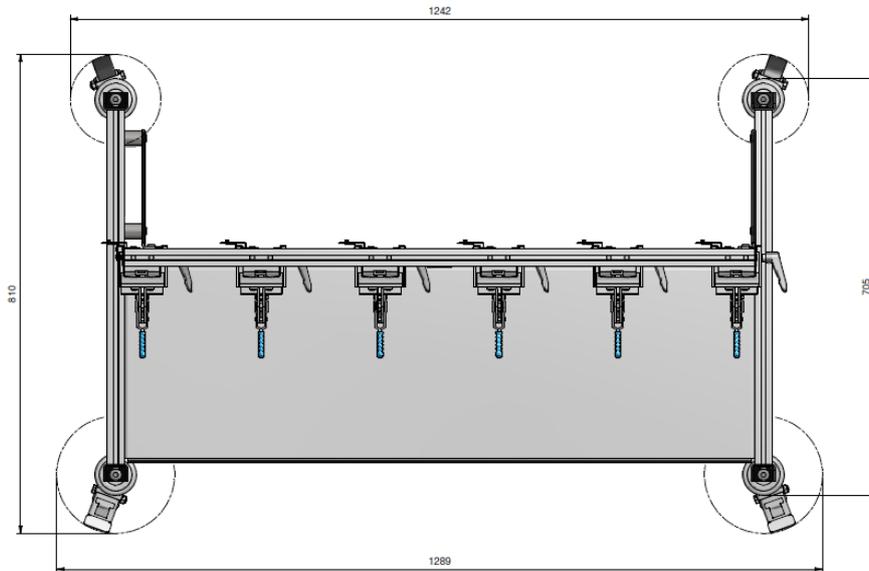
TECHNICAL DATA

Dimensions

Wall Mounted FlexiFrame



Wheeled Base FlexiFrame



CE Conformity

FlexiFrame is CE marked and therefore conforms to EC Regulations.

For more information regarding the CE marking and accreditation please contact James Heal.

JAMES HEAL SERVICE & CALIBRATION

James Heal Service & Calibration is an ISO 17025 based comprehensive, worldwide support programme.

Our instruments come with an 18 months warranty period.

Our aim is 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: 1555/15/1001 and V1.00.

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REVISION HISTORY

See front cover for Publication number, e.g., 290-1511-1\$A

Revision	Date	Originator	Details of revision
1	21/01/16	CB	Version 1
2	24/02/16	LE CB	Additions to wheeled base assembly Accessories