



# ElmaTear

## DIGITAL TEAR TESTER

For markets as diverse as paper, plastic, non-woven and textiles, ElmaTear is the only software driven Electronic Elmendorf tester that offers 1/4 A to E pendulums. This allows laboratories to increase their range of testing and attract additional business revenue.

**MODEL NUMBER: 1555**  
**STOCK CODE: 903-304**



### KEY BENEFITS

#### RANGE OF WEIGHTS

A, B, C, D and two additional lighter weights, 1/2A and 1/4A, are included as standard. An optional E Pendulum kit is available for testing up to 128 N.

#### STANDARDS DRIVEN

A comprehensive list of existing standards organised by sample type are available for selection. The details of each standard are predefined within the instrument.

#### TESTWISE FOR ELMATEAR

TestWise for ElmaTear packages results and sends them to a computer, where the user can add more detail, create graphs or save to PDF.

#### 7 INCH, FULL COLOUR TOUCH SCREEN

A capacitive touch screen increases functionality and makes the instrument easier to use.

#### INTELLIGENT TESTING

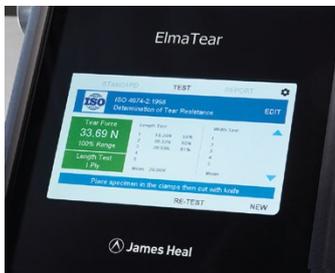
The ElmaTear identifies the acceptable range of results for each standard and warns the user when their testing falls outside of this.

#### PENDULUM SELF VERIFICATION

This routine verification ensures the pendulum is performing correctly in between annual calibrations. It means the user can be certain of accurate and reliable testing every time, with minimal input required from them.

#### IMPORTANT SAFETY FEATURES

A two hand release mechanism ensures the user is clear of the pendulum swing.



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## DEVELOPING THE ELMATEAR

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When developing the new ElmaTear we took into account that many busy laboratories receive a vast array of samples to test, and would currently need to buy two separate machine to meet these testing requirements. In some cases it may not be possible to justify this capital expenditure for a second machine and samples may have to be sent out for external testing adding an unwanted time delay.

By extending the range of weights available, and therefore increasing the range of samples the ElmaTear can test, laboratories only need to purchase the ElmaTear to meet their customers requirements.

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## THE SCIENCE BEHIND THE ELMATEAR

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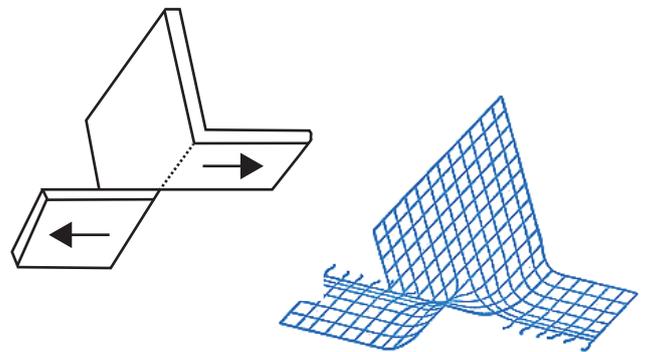
### SCOPE OF APPLICATION

The test procedure is applicable to woven fabrics, coated fabrics, foils, paper, board, plastic films, nonwoven fabrics, laminates and other sheet materials. It is not applicable to knitted textile fabrics or anisotropic materials.

### SUMMARY OF THE TEST PROCEDURE

ElmaTear employs the energy conversion principle, i.e., potential energy converted to kinetic energy, to determine the work done. The potential energy is stored in the pendulum by raising its centre of gravity to a known distance above its neutral point. The work done on the test specimen is the difference between the original potential energy and the sum of remaining kinetic and potential energies at the completion of the tear. This sum determines the amplitude of the pendulum arm swing. All air resistance and friction losses are compensated for through calibration and thus this amplitude is used to calculate the work done. The tearing force is calculated by dividing the work done by twice the tear length (2 x 43mm).

The mode of tearing is more or less as shown in the figures below, but the relative angle of pull changes continuously during the test. This means that the mode of failure is a continuously changing combination of in and out of plane tensile and shear.



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## THE TEST

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- STEP 1** Use the specimen templates supplied with the ElmaTear to cut your specimen to the size for the relevant standard under test.
- STEP 2** Place the test specimen centrally in the jaw so that it is aligned to the bottom of the jaws. Lift the handles into a vertical position to clamp the specimen.
- STEP 3** Pull the lever on the left side of the instrument forward to 'notch' the specimen with the blade, you will be prompted to do this by the screen.
- STEP 4** Press both illuminated buttons at the same time to release the pendulum, the specimen will tear as the moving jaw moves away from the fixed jaw. The pendulum will swing toward you and the result of the test will be displayed on the screen.

# APPLICATIONS

## WOVENTEXTILES

Woven fabrics including

- Shirts
- Trousers
- Domestic fabrics



## NONWOVEN TEXTILES

Nonwoven materials including

- Surgical gowns
- Shopping bags
- Disposable clothing



## PAPER

Paper products including

- Envelopes
- Brochure pages
- Bank notes



## PLASTIC

Plastic products including

- Document wallets
- Food packaging
- Films



# STANDARDS

## Pre-Loaded Standards

Textile	ASTM D 1424 GB/T 3917.1 EN ISO 13937-1 ISO 4674-2 M&S P29	NEXT 17 AS 2001.2.8 BIS IS 6489-1 CAN/CGSB 4.2 No.12.3 JIS L 1096 Method D
Non-Woven	WSP 100.1	
Paper	GB/T 455 ISO 1974 PAPTAC D9	TAPPI T414 AS/NZS 1301.400S
Plastic	ASTM D 1922 ISO 6383-2 JIS K 7128-2	BIS IS 13360-5-23 GB/T 16578.2

# ELMATEAR AT A GLANCE



Easy to grip pendulum handle

Range of pendulum weights from 2N to 128N

Innovative rotary cam lock jaws with increased clamping strength

Long-life, increased efficiency, enclosed blade

Rubber drop mat

Spirit level for easy and accurate levelling

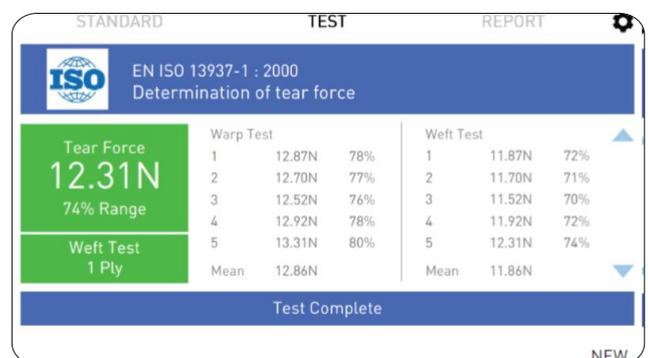
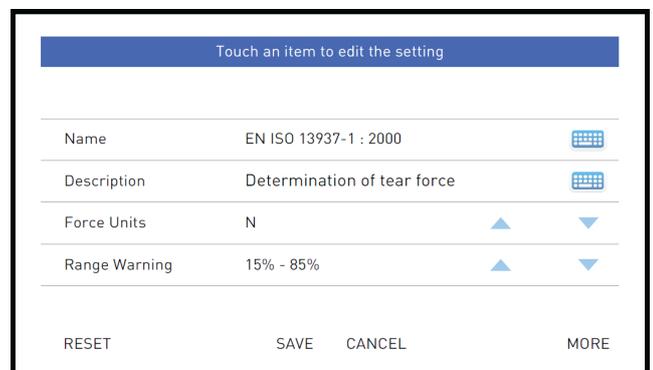
Specimen notch detection

7" capacitive touch screen with new software

Safety buttons placed at more than hands width apart

# COLOUR TOUCH SCREEN

- The introduction of a 7 inch capacitive touch screen makes the ElmaTear fast and responsive, in line with smartphones and tablets. The screen angle has been ergonomically designed to give the optimum fit between the users and the instrument.
- The clear and uncluttered display maximises user efficiency, and contributes to an intuitive experience for first time users. It is easy to navigate - the software has been designed to minimise the number of key strokes required to set up and activate the test.
- Twenty pre-programmed standards, organised by material test type, can be easily selected from the main menu screen. Each standard is accompanied by the relevant logo for easy identification.
- There is also an option for the user to create, name and save their own standard from the main menu.
- Standards can be easily edited by touching the 'EDIT' button, which provides the option to edit test parameters and how the results are displayed. Pendulum weight, number of plies, number of specimens (length and width) and the specimen weight can all be amended.
- There is an option to send test reports to TestWise for ElmaTear on a PC for archiving and printing, but the comprehensive onboard software means it can also be operated independently.



## A RANGE OF WEIGHTS

Two additional weights, suitable for testing lighter specimens such as paper, film, nonwovens and plastic, have been added to the ElmaTear. It is supplied with A, B, C, D and the new ½ A and ¼ A as standard. An optional weight E, for testing to 128N, can also be ordered.

Weights ½A to E are pictured, ¼ A is fitted to the instrument as standard.

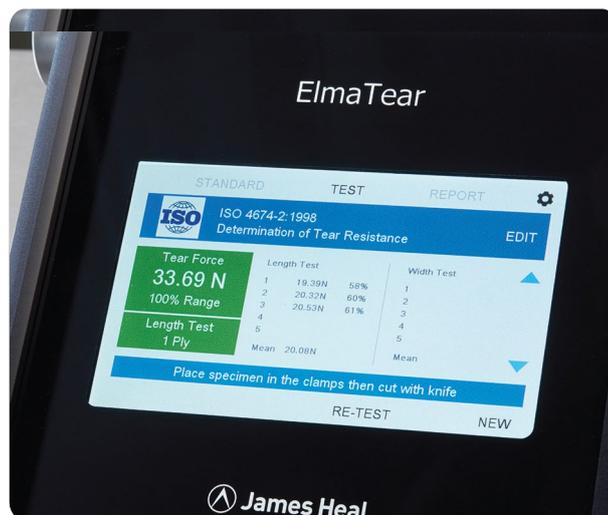
This range of weights enables the ElmaTear conforms to a broader range of standards, which enables the user to test a wider variety of materials. Laboratories can increase the range of testing that they do and attract new business as a result of this.



## PRE-LOADED STANDARDS

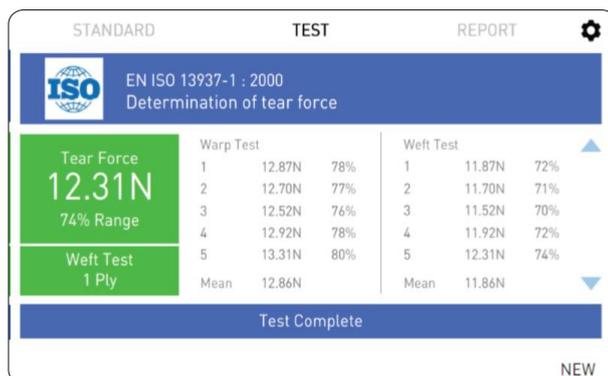
ElmaTear includes an extensive list of pre-loaded standards, organised by material type for easy selection. The parameters of each standard are pre-defined within the machine - the user will not have to set units, weight, ply, range, each standard is available at the touch of a button,

There is the option to amend the parameters of existing standards, ideal for retailers who have adapted standards to meet their own testing requirements. This allows businesses to quickly adapt to changes to standards in the future, with no additional software required.



## DETAILED REPORTING

The comprehensive reporting function means that the length and width results from the same sample can be seen at the same time. This clarity in reporting makes results quick and easy to analyse.



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## COMPREHENSIVE SAFETY FEATURES

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A two hand release mechanism ensures the user is clear of the pendulum swing. The blade is covered with a safety guard for extra protection.

These features make operating the instrument very safe, which is important for the wellbeing of employees and responsibility of employers.



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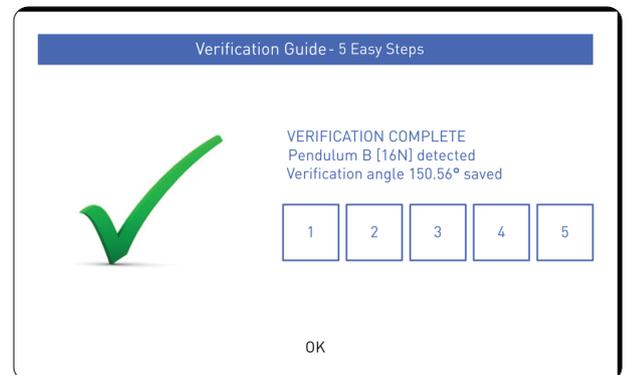
## SELF VERIFICATION IN ONE SWING

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The ElmaTear performs pendulum self-verification in one swing, a significant reduction in time on the previous model and other similar products in the market.

This procedure is demonstrated and explained clearly in the software in 5 easy steps, allowing the user to complete this in just a few touches of the screen.

This means the end user can be certain of accurate and reliable testing every time, with little to no input required from them - this quick step ensures the pendulum is performing correctly between annual calibrations.



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## PROTECTIVE MAT

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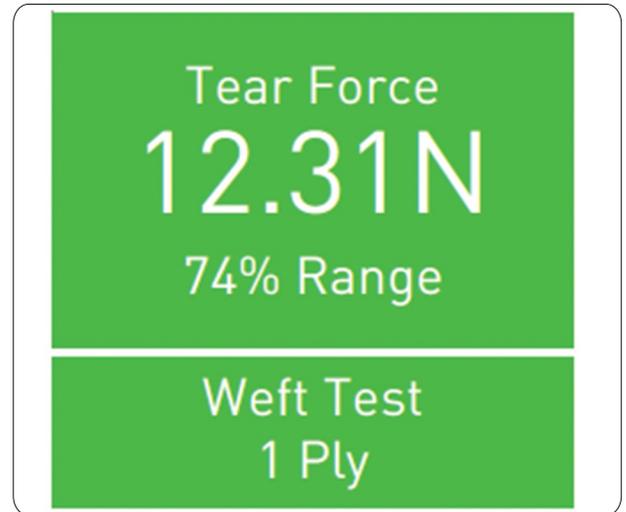
A protective mat around the base of the instrument protects it from laboratory wear and tear. This keeps the instrument in good condition, increasing its lifespan.



## INTELLIGENT TEAR TESTING

User error is kept to a minimum as the intelligent ElmaTear provides guidance and warnings.

For example, the ElmaTear gives a range warning if results fall within the upper or lower end of the scale, and recommends a different pendulum to be used. The user then has the option to accept or reject the result.



## INVESTMENT IN BLADE TECHNOLOGY

An investment in blade technology has increased the efficiency of the ElmaTear blade. It provides more accurate cutting, increased wear resistance and a longer life span.



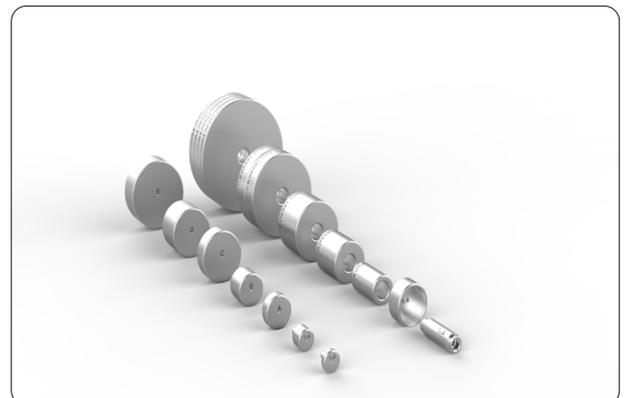
## OPTION TO RE-TEST

The onboard software allows the user to review individual specimen results, delete them and add in additional specimens. This solves the problem of outlying results in a quick and efficient manner, saving the user time.

STANDARD		TEST		REPORT	
ISO		EN ISO 13937-1 : 2000		Determination of tear force	
Tear Force		Warp Test		Weft Test	
12.31N		1	12.87N 78%	1	11.87N 72%
74% Range		2	12.70N 77%	2	11.70N 71%
Weft Test		3	12.52N 76%	3	11.52N 70%
1 Ply		4	12.92N 78%	4	11.92N 72%
		5	13.31N 80%	5	12.31N 74%
		Mean	12.86N	Mean	11.86N
Test Complete					
NEW					

## CHECK WEIGHTS

ElmaTear is supplied with a set of check weights, one for each corresponding pendulum. They enable the operator to confirm that the unit is functioning correctly.



# TESTWISE ANALYSIS SOFTWARE



The ElmaTear is further enhanced and supported by the easy to use and intuitive TestWise analysis software.

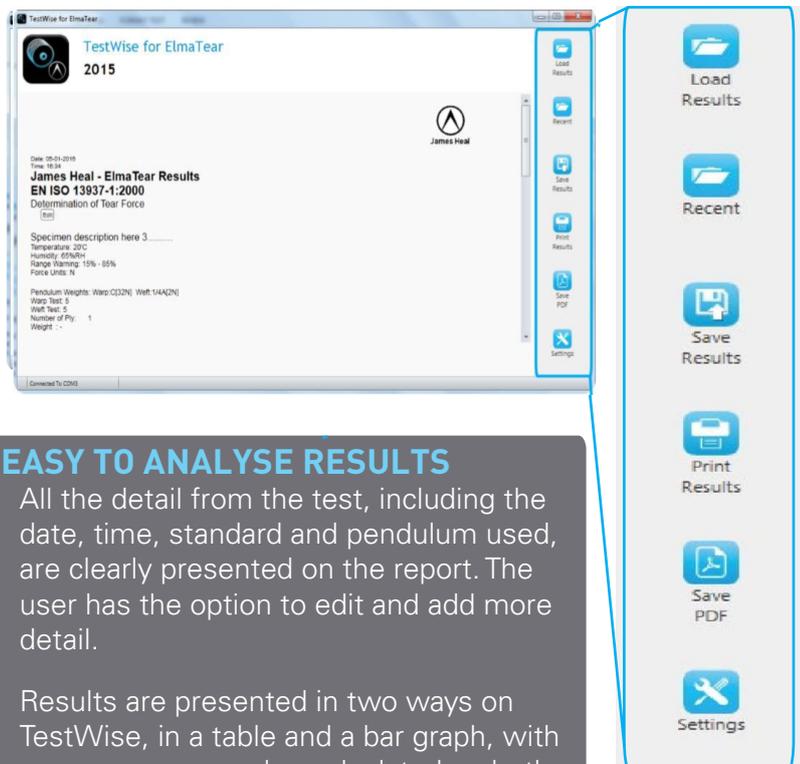
## AUTOMATIC TRANSFER OF DATA

TestWise for ElmaTear packages results and these can be transferred to a PC automatically by touching the 'SEND' button on screen. There is no opportunity for human error as there is no need to manually transfer results.



## SIMPLE NAVIGATION

The menu bar gives the option to load new results or look back through recent testing. It is clearly laid out making easy to use.

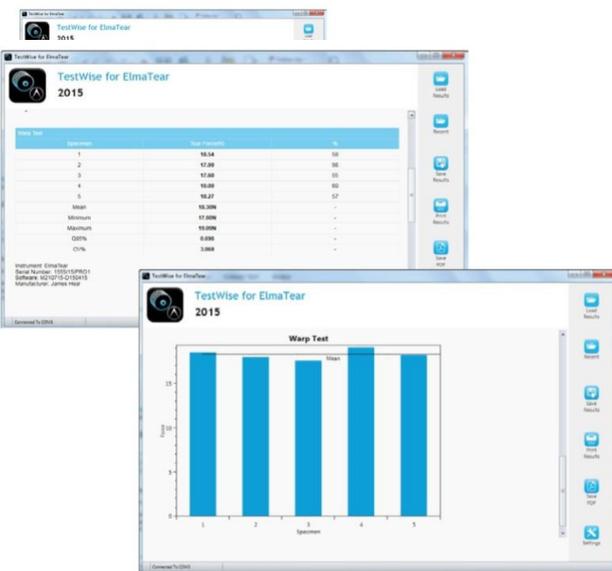


## EASY TO ANALYSE RESULTS

All the detail from the test, including the date, time, standard and pendulum used, are clearly presented on the report. The user has the option to edit and add more detail.

Results are presented in two ways on TestWise, in a table and a bar graph, with a mean average value calculated on both.

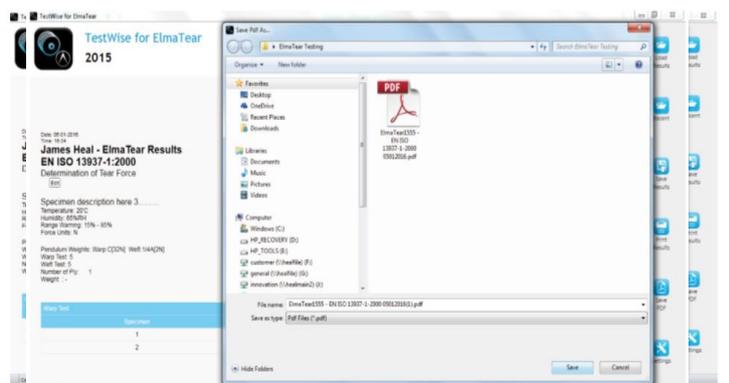
This quick and easy process makes analysing results simple, less time needs to be spent on therefore increasing user productivity.



## ARCHIVING TOOL

TestWise allows the user to save and print their results, and save to PDF. A company logo can be added for to personalise the presentation of results.

The function to save all results means that looking back through testing can be done with the click of a mouse.



# ELMATEAR INSTRUMENT & ACCESSORIES

## Instrument & Standard Accessories

Stock No.	Name
903-305	ElmaTear 1555 Intelligent Digital Tear Tester 85-264V 50/60Hz Max. Capacity: 6400gf (14.1 lbf)
	4 Rubber-Covered Jaw Inserts
	5 Pendulum Weights (0.5A-D)
	6 Check Weights (0.25A-D)
	4 Specimen Preparation Templates (772-108, 772-109, 772-117 & 772-118)
	1 Cutting Board
	1 Spare Blade
	1 Blade Setting Tool
201-1555	ISO Certificate of Calibration for Elmatear1555

## PC Software Package (Data Logger)

Stock No.	Comprising:
794-995	Windows-compatible Software on CD-ROM Permits logging of tear force values, statistical calculations, saving, printing, exporting results and report generation
	Including USB cable (2m)

## E-Pendulum Kit - Extends capacity to 12800gf (28.2 lbf)

Stock No.	Comprising:
794-777	1 x Set Pendulum Weights (E)
	1 x Check Weight (E)
	1 x Set (4) Pyramidal Profile (interlocking) Jaw Inserts

# TEST MATERIALS & SPARES

## 2-year Spares Kit

Stock No.	Comprising:
1555-spares	Blade (761-818)
	Wheel Block Set (794-738)
	Torsion Spring (375-514)
	Set (4) Plain Jaw Inserts (794-737)
	Fuse 1A 20mm Antisurge (130-825)
	Electromagnetic Brake Assembly (160-462)
	Shot-Bolt Assembly (390-237)

## Spares Parts for ElmaTear

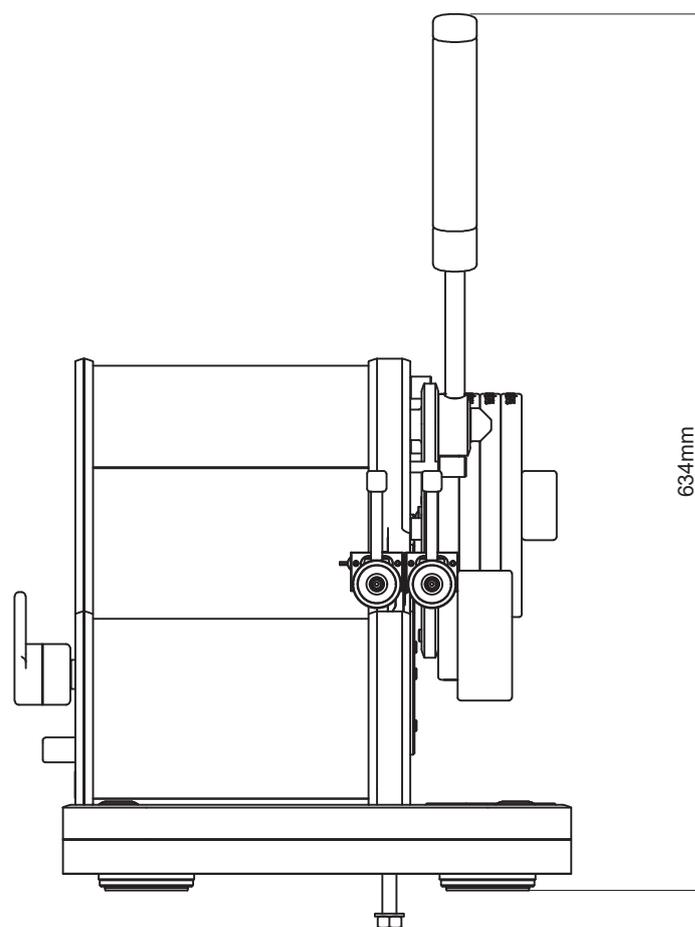
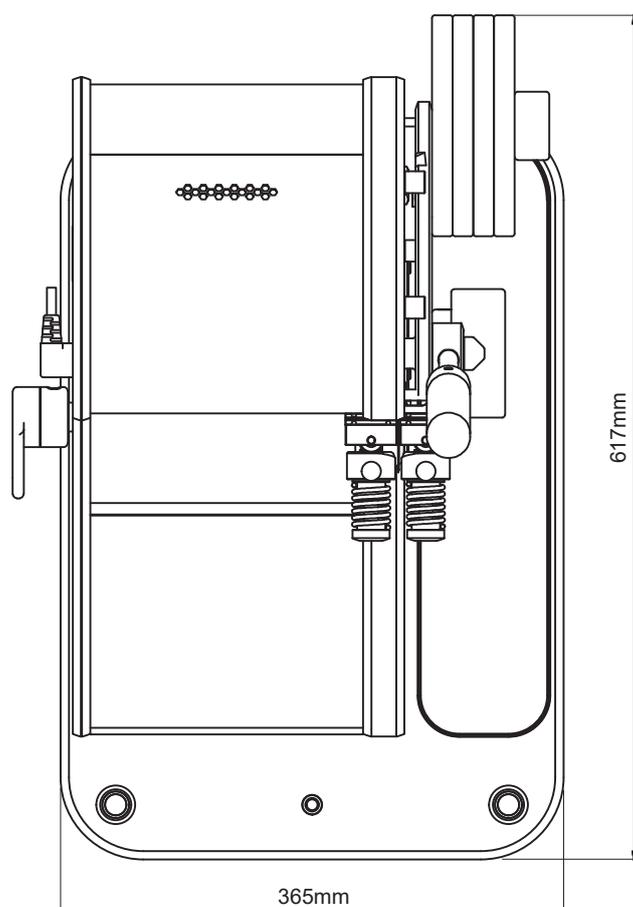
Stock No.	Name
761-818	Blade
794-738	Wheel Block Set
375-514	Torsion Spring
794-737	Set (4) Plain Jaw Inserts
130-825	Fuse 1A 20mm Antisurge
160-462	Electromagnetic Brake Assembly
390-237	Shot-Bolt Assembly
794-739	Set (4) Serrated Jaw Inserts

## Spare Specimen Preparation Templates

Stock No.	Name
772-108	Template 100 x 63 mm - ISO 9290 Method B
772-109	Template 100 x 63 mm (Shaped) ASTM D1424-96 and ISO 9290 Method A
772-117	Template 102 x 63 mm (Notched) ASTM D1424-96
772-118	Template 100 x 63mm (Notched) ISO 13937-1
772-124	Template 78 x 63mm (Paper method) ISO 1974
772-284	Template ISO 6383-2
772-287	Template ASTM D1922-08

## DIMENSIONS & WEIGHT

Dimensions (mm)	Height	Width	Depth	Approx Weight (kg)
	634	365	617	60



## INSTALLATION GUIDE

Item	Comment
Electricity	85 to 264V AC 50/60Hz      Single Phase 0.5 / 1 A 60 W
Air	Not required
Bench or Floor Standing	ElmaTear is designed to be placed upon a bench
Water Supply	Not required
Drainage	Not required
Air Extraction	Not required
Conditioning	It is recommended the instrument is located within a conditioned atmosphere.

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

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