🔿 James Heal



OPERATOR'S GUIDE

Titan⁵ Universal Strength Tester Model 1410

TestWise™ Test Analysis Software

Covering Serial Numbers 1410/14/1001 and upwards

Extraordinary Testing Solutions

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



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Setting the Standard

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TABLE OF CONTENTS

OPERATOR'S GUIDE	1
Table of Contents	3
JAMES HEAL	5
Setting the Standard	5
Areas of Expertise	5
TITAN - UNIVERSAL STRENGTH TESTER	6
Installing TestWise	7
Recommended Specification for PC and Printer	7
Installing TestWise Test Analysis Software	8
Licensing Dongle	9
Licensing Dongle Installation	. 11
Software Installation	. 12
Starting TestWise for the First Time	. 14
User Management	. 16
TestWise Start Screen	. 18
TestWise Options and Customisation	. 20
Using Search Filters to Find a Standard	. 23
Your Favourite Standards in One-Click	. 25
Creating Favourite Groups for Standards	
Quick Start	. 29
The Essential Elements of TestWise	. 29
Making Changes During the Test	. 42
Changing the Number of Specimens	
Adding a Specimen	. 44
Delete a Specimen	. 45
Useful Features	. 46
Selecting Jaw Schemes	. 46
Show Data Points	. 48
Find Force or Find Extension	. 49
Auto Hide Panes	. 50
Copy Graphs, Copy Results and Export Data	. 51
Reset	. 52
Manual Control	. 53
Collapse and Expand	. 55
Using the Standards Editor	. 56
Creating Custom Standards	. 56
Setting Up a New Jaw Scheme	. 63

T19 CALIBRATION CHECK WEIGHT SET	
Instructions for Use	
Applications	74
Tensile Strength and Elongation	75
Fabric – strip test	75
Fabric – grab test	79
Yarn – Skein / Hank / Lea strength	
Fabric Tear – trouser tear test	
Fabric Tear – wing-rip tear test	
Fabric Tear – other tests	
Seam Slippage – fixed seam opening method	94
Seam Slippage – fixed load method	97
Stretch & Recovery – line contact	100
Stretch & Recovery – loop bars	103
Button Strength	108
Security of Attachments	111
Ball Burst	113
Safety	115
General	115
Emergency Stop Button	115
Impact Protection	115
Soft Closing Jaws	115
Unpacking	116
Installation	118
Installation Requirements	118
Electrical supply	118
Compressed Air supply	118
Environment	118
Technical Specification	119

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

Textile: Physical

- Abrasion
- Bursting Strength
- Compression and Puncture
- Crease and Wrinkle Recovery
- Crimp
- Drape
- Durability
- Flammability
- Mass per unit area
- Pilling and Fuzzing

- Perspiration
- Phenolic Yellowing
- Print Durability
- Rubbing
- Washing
- Water
- 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

TITAN - UNIVERSAL STRENGTH TESTER

Titan⁵ is an outstanding, fourth generation Universal Strength Tester, designed specifically for testing textiles, nonwovens and leather in various forms : yarns, fabrics, garments and security of attachments.

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 Analysis Software, an extensive range of specimen grips and a comprehensive library of international standards and retailers' own test methods.

Features and Benefits

- Compact, desk top, standards-compliant Universal Strength Tester
- Operates as standard in both tension and compression
- Extensive range of tool-free, interchangeable specimen grips
- Choice of three load cells up to 5000N (approx. 500kg): load cells supplied in cartridge form to improve protection and to facilitate safe handling and storage
- Microsoft Windows look and feel and familiar industry specific terminology
- Single Software Package for yarn, leather, fabric and nonwovens: tensile strength, seam slippage, security of attachments, button strength, pile loop extraction, tear strength, peel bond (delamination), stretch and recovery (cyclic), ball burst, puncture and crushing
- Extensive library of pre-loaded, national and international standards and of retailers' test methods
- 'Standards Editor' making it easy to modify existing standards or create new methods
- Automatic setting of test parameters including gauge length after selection of required standard or method
- 'Three Clicks' to start testing !

Service and Calibration

- Worldwide Service
- UKAS (ISO 17025 based) Accredited Calibration Service (tension and/or compression)
- 18 Months' Warranty



Technical Assistance

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

INSTALLING TESTWISE

Recommended Specification for PC and Printer

Computer	Personal Computer (PC). The use of Apple MACs running Windows in a Virtual Machine (VM) is not supported.
Processor	As specified or required by the operating system. (Use the "recommended" specification).
RAM (memory)	As specified or required by the operating system. (Use the "recommended" specification).
Operating System	Windows [®] 8, Windows [®] 7, Windows [®] Vista (SP2). Compatible with 32-bit or 64-bit OS where applicable. The Microsoft dotNET Framework must be installed.
Graphics Card	None required.
Monitor	Minimum resolution of 1024x768 pixels.
Hard Drive	250 GB (2 GB equates to about 1 year's testing for a typical Laboratory, without archiving).
Optical Drive	CD-ROM or DVD-ROM drive compatible with CD-R media.
Ports	At least 2 free USB 2.0, one for communications cable, one for licensing dongle
Printer	Any Windows compatible printer can be used. Colour printer recommended but not required.
Internet	Broadband – Optional, but required to take advantage of the James Heal Online Support Package.

specification. The company cannot, however, accept responsibility for any additional or resident software which may compromise the operation of the PC or TestWise software.

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Installing TestWise Test Analysis Software

TestWise is the name of the software used to control and view results from the **Titan** instrument. It is installed from one CD. The **Titan** instrument cannot be used without **TestWise**.

The PC must be running Windows Vista, Windows 7 or Windows 8. Other operating systems or Windows running in a virtual machine (VM) are not supported. **TestWise** is optimised for Windows 7 and 8.

Before installing **TestWise** ensure your dotNET Framework is up to date using the Windows Update service or visiting <u>http://www.microsoft.com/net/downloads</u>

Ensure the PC to be used to run **TestWise** and control **Titan** meets the requirements described on the previous page.

IMPORTANT LICENSING NOTE:

TestWise uses a licensing dongle. Whenever possible keep this permanently inserted into a USB port. **TestWise** will not operate unless the licensing dongle is present. Charges will apply for replacement licensing dongles.

Licensing Dongle

TestWise 2013 and later is licensed using a USB dongle.

If a valid licensing dongle is not detected TestWise will disable all its functionality.

The licensing dongle must be plugged into the PC before running TestWise. It must then remain in place in the PC for TestWise to function correctly.

The licensing dongle is not a memory stick or flash drive.



TestWise checks for the presence of a valid licensing dongle at launch and will only allow login if a valid licensing dongle is present. If is not detected you will see:

Username:		
Password:		Login
🗙 TestWise	cannot detect a valid lice	<u>Exit</u> nse dongle

Whilst TestWise is running it also checks for the licensing dongle at random intervals. If the licensing dongle has been removed then the entire application is disabled.

∥ - File Test	Results				TestWise 2015 - T	est Analysis Software	
	Dopy Export Export Data Excel	Add Specimen	Reset Select Show Data Offset AL Points	Extension mm Force kgf Units Max Force Max Force		Ø Mean Range Ø Conf Limits Min Median Ø Coeff Of Var Max Std Dev Statistics	
				Те	stWise cannot	detect a valid license dongl	e
pecimens	•	Graph Result	ts				
1	10.61 kgf	Results					
2	10.04 kgf						
		C	H F (0	((10)	E.t	
3	10.68 kgf	Specimen	Max Force (kgf)	6mm Seam Opening Fe	orce (kgf)	Extension at 6mm Seam Open	ing (mm
■ 3 Mean		Specimen 1	Max Force (kgf) 20.08	6mm Seam Opening Fo 10.61	orce (kgf)	Extension at 6mm Seam Open	ing (mm
	10.68 kgf	Specimen 1 2			orce (kgf)		ing (mm
	10.68 kgf	1	20.08	10.61	orce (kgf)	12.66	ing (mm
-	10.68 kgf	1	20.08 22.51	10.61 10.04	orce (kgf)	12.66 12.32	ing (mm
	10.68 kgf	1 2 3	20.08 22.51 24.72	10.61 10.04 10.68	orce (kgf)	12.66 12.32 11.80	ing (mm

If the dongle is subsequently re-inserted it will take up to 5 seconds to be detected by TestWise and enable the interface.

l∥∓ File Test	Results					TestWise 2015 - Tes	st Analysis So	ftware		
Print Copy Graph Rest Gene	ults Data Excel	Add Specimen	Reset Select Show Data Offset Points	Extension mm Force kgf Units	Max Force Gmm Seam Opening Force Extension at 6mm Seam Opening Columns	Observations	Min		☑ Conf Limits ☑ Coeff Of Var	
Specimens	▼ ₽ 10.61 kgf	Graph Resul	ts							
2	10.04 kgf 10.68 kgf	Specimen	Max Force (kgf)		6mm Seam Opening Force	(kgf)	Exten	sion at 6m	nm Seam Open	ing (mm)
Mean	10.44 kgf	1	20.08		10.61		12.66			
		2	22.51		10.04		12.32			
		3	24.72		10.68		11.80			
		Mean	22.44		10.44		12.26			
		Conf Limits	±5.77		±0.8678		±1.08			
		Coeff Of Var	10.34%		3.34%		3.53%			

Charges will apply for replacement licensing dongles therefore please take good care of it.

Licensing Dongle Installation

Installing the licensing dongle is simple.

Before starting TestWise, insert the licensing dongle into a free USB 2.0 port. After a few seconds the green LED will illuminate.

The driver for the licensing dongle will be installed.



The licensing dongle is now installed.

Leave the licensing dongle permanently inserted into the USB port.

Software Installation









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Insert the **TestWise** CD into the CD or DVD drive on your PC.

The setup will auto-run and you will first be prompted with this dialogue box.

Click **<u>N</u>ext** to continue.

We recommend installing **TestWise** to the default location.

This is the default folder in Windows 7 and 8. Windows Vista may show different default locations.

Click **<u>N</u>ext** to continue.

The setup procedure is now ready to install TestWise on you PC.

Click **<u>N</u>ext** to continue.



Back Ensh Cancel



TestWise is being installed, please wait.

TestWise has been successfully installed.

Click Close.

Before attempting to run **TestWise**, please use the Windows Update service or by visiting <u>http://www.microsoft.com/net/downloads</u> to check for any updates to the Microsoft dotNET Framework.

You will now see the TestWise icon on your Windows Desktop.

Starting TestWise for the First Time

Before using **Titan** and **TestWise** together you must configure **TestWise** with Load Cell and Jaws Schemes data. This is a simple process which takes only a few minutes and is required only once.





Double-click the **TestWise** icon on your Windows Desktop to start **TestWise**.

While the **TestWise** application loads, the following splash screen displayed.





This is the first run screen.

Once this procedure is completed you will not see this again.

	IMPORTANT - Please Wait for TestWise to establish a connection with Titan.
	Allow TestWise a few moments to find the correct USB port connection for communications.
Work Offline Connecting using COM99	When the red text clears connection has been established.
Welcome to TestWise. Click the button below to upload your configuration data from Titan. Start Upload Use Factory Defaults Exit	Click the Start Upload button to begin the upload of configuration data from Titan .
Welcome to TestWise. Click the button below to upload your configuration data from Titan.	The upload of your loadcell calibration data and jaw scheme data commences. This usually takes less than 10 seconds.
The configuration has been uploaded from Titan and TestWise is ready to use. A user account has been created for you: admin/password. User accounts can be edited through the Options dialog.	Setting up new users is detailed on the next page.
Exit	Click the Continue button to begin using TestWise .
We come to TestWise We come to TestW	You will then be taken to the TestWise main screen.
2015 inter time inter tinter time inter time inter time inter time inter time inter time	The various elements of this screen will be explained later.

User Management

TestWise creates a new user called "Admin" using a password of "password".

We recommend you add at least one user with Administrator level and one user with Operator level.

Administrator level users can make changes to the TestWise system and make tests. Operator level users can make tests, including saving, printing and retrieval.



Manual

)		TestWise Options	
General Graph	Edit the people allo	owed to use TestWise	
Jaws	New	Delete	
Jaw Schemes	Administrator	Name:	A N Other
Load Cells	Operator	Username:	ano
TestWise Settings Titan Settings	A N Other	Password:	
Titles		Account Type:	Administrator
Users		Account type.	-
Manual			
Firmware			
General	Edit the people allo	owed to use TestWise	
Graph	Edit the people allo	owed to use TestWise	
Jaws	New	Delete	
Jaw Schemes	Administrator	Name:	Tech
Load Cells	Operator	Username:	Tech
TestWise Settings	A N Other	Password:	
Titan Settings	Tech	Account Type:	
Users		Account type:	Operator •
Manual			
Firmware			
1.1			

In this example we will create a user with Administrator privileges.

Enter the user details and then click Apply.

In this example we have created a user with Operator privileges.

When users have been added, click Apply followed by OK.

The **TestWise** Options will close when you click OK.

From the main screen, choose Logout.

Then Login again using the users details you entered.



Username:	
Password:	Login
	Exit

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TestWise Start Screen

The TestWise start screen has been designed like a dash board so that the most popular tasks are easily and quickly available.

0 I =	TestWise 2015 - Test Analysis Software	- 7 💌
File Test	Add Dots East Deate Parameter Composition Parameter Composition Composition	
Welcome to TestWise 2015 9 Nock Recent Standards	New Image: Cpue Image: Cpue Image: Cpue 9 Mont Recent Tests	Titan SN: 1410/14/1001 Licensee: James Heal Version: 50.01.0 Connected: Yes Load Cell: 5000 N Emergency Stop: Off Firmware: V2.7





The **New** shortcut takes you to the Standard Library ready to select a standard and start a new test.

The **Open** shortcut takes you to the Open Test File dialogue. This is used to look at tests you have previously made and stored.

The **Favourites** shortcut takes you to your selected favourite standards in the Standard Library ready to select a standard and start a new test. This is a great time saver.

Favourites will be explained in more detail later. The **Manual** shortcut brings up a screen to allow manual control of Titan outside of the test environment.

5 Most Recent Standards Arcadia AG39 (07.12) SEAM SLIPPAGE - GARMENT SEAM METHOD	The 5 most recently used standards are displayed. If you click the standard it will be selected ready to start a new test.
5 Most Recent Tests Example Manual Seam Opening Test Standard: Arcadia AG39 (07.12) File: C:\Users\pg.JHEAL\Desktop\Example Manual Seam Opening Test.xml	The 5 most recent tests are displayed. The Title of the test, the standard used and the folder location is shown.
	If you click the test title, the test file will be opened.
5 Most Recent Tests	l
Image: Standard: EN ISO 13937-2:2000 Image: File: C:\Test Results\Trouser Tear Example #5.xml	If the mouse if hovered over the test it is highlighted.
5 Most Recent Tests	
Trouser Tear Example #5 Standard: EN ISO 13937-2:2000 Create a new test based on this one Tear Example #5.xml	If C is clicked then a new test based on this standard and any customisations will be setup ready to start a new test.
5 Most Recent Tests	
Trouser Tear Example #5 Standard: EN ISO 13937-2:2000 File: C:\Test Results\Trouser Tear Example #5.xml Remove this item from the list	If 🙆 is clicked then this test is removed from the Most Recent list. Please note it is not deleted.
Remove this item from the usit	
Titan SN: 1410/14/1001 Licensee: James Heal	The top right of the TestWise start screen shows some useful information about TestWise and your Titan.
Version: 5.0.11.0	Licensee will normal display your company
	name.
Connected: Yes	This is live data and subject to change. For example, if the change the loadcell, the force
Load Cell: 5000 N	capacity will be updated.
Emergency Stop: Off	
Firmware: V2.7	

TestWise Options and Customisation

Before you begin testing there are some Options which you should change to suit you preferences. Below are some of the options which you may like to change before you start any testing.

If you are unsure about what effect changing an option maybe then we recommend not making the change, keeping the default settings.

Go to File > Options.

•	TestWise Options
General Graph	General options for working with TestWise
Javs Jav Schemes Load Cells TestWise Settings Titen Settings Users Jarnal Firmware	Communications Version: Serial Port: COUMB Sample Freq (Test): Source Sample Freq (Other): 200.00 ⊕ ms Test Files Default Pate
	Languages Use operating system Language English 中国的/Chinese (Simplified) Useroning 中國的/Chinese (Institutional) English TestWise Version: 5.0.11.0 Francal/French France/French
	Titas Ske 14/01/4/1001 Railano/Italian Licensee: James Heal Trik/Turkish
	Download Configuration to Titan
	Apply OK Cancel

> General > Language

If you change the Language settings then you must Apply the changes and then close and re-start TestWise.

> General > Test Files

Set the preferred path to save test files.

For example, you may wish to save your test files to a network location.

Browse using the witton.

Click Apply when finished.

0	TestWise Options
General Graph	General options for working with TestWise
Graph Jaws Jaw Schemes Load Celis TestWise Settings Titas Settings Titas Users Manual Firmware	Communications Version: 5.0.11.0 Serial Port: C0099 • ○ Offline Sample Freq (Test): 50.00 @ ms Sample Freq (Other): 200.00 @ ms Test File
	Apply OK Cancel

•	Test	Wise Options	×				
General Graph	Titan settings						
Jaws	Changes to settings shall only apply to newly created tests						
Jaw Schemes	Pretension Speed:	20.00	mm/min 👻				
Load Cells	Speed:	100.00	mm/min 🔻				
TestWise Settings Titan Settings	Home Speed:	2000.00	mm/min 🔻				
Titles	Click Threshold:	500	ms				
Users	Hold Threshold:	2000	ms				
Manual	Air Pressure (Soft):	2.00	bar				
Firmware	Air Pressure (Test):	7.00	bar				
	Air Pressure Stabilisation:	2500	ms				
	Air Pressure Stabilisation (Off):	500	ms				
	Ignore Low Air Pressure:						
	Gravity (Local):	9.80665	m/s ²				
	Hold Force Threshold:	90	s				
	Air Pressure Offset (ITV):	0.1000	bar				
	FlexoLed Brightness:	100					
	L	Ap	ply OK Cancel				
		Ab)	and Cancer				

3	TestWise Options	×
General	Specify names for the test attributes	
Graph		
Jaws	1: Test Name	
Jaw Schemes	2: Customer	
Load Cells		
TestWise Settings	3: Reference	
Titan Settings	4: Material	
Titles	5: Comments	
Users		Add
Manual		Add
Firmware		



Specify names for the test attributes





> Titan Settings

We recommend you only change these values when requested by James Heal.

If you know your Local Gravity value, enter it here, followed by Apply.

If you don't know your Local Gravity Value, do not change this value.

> Titles

These are perhaps the most practical settings as they are used in the Test Report.

The Titles are used to describe the sample/specimens.

For example, you may want to change Test Name to Batch Number or Job Number.

Try to decide these Titles before you begin testing.

When finished click Apply followed by OK.

Title fields can be added or removed.

Click 📕 to remove



Click diamond to add another title field

Add

– Optional Information					
Test Name					
Customer					
Reference					
Material					
Comments					
Remove					

+ Standard Customisation



Title fields can also be changed at the time of testing after the Standard has been selected.

Any changes to the Titles are also saved in the test data file.

> TestWise Settings

Check these options if you would prefer them applied globally throughout TestWise.

Always display observation result column: 🗐

Display test report when all samples are complete:

If you always want Observations to be shown in the test report.

If you always want to skip the results/graph display and go straight to the test report print preview.

Using Search Filters to Find a Standard

TestWise uses a variety of search filters which enable you to quickly find the standard you need. You can simply search or use any of the special filters. Special filters reduce the standards list by Group (see Favourites later), by Test Type or by Material. The filters can be used in combination. The search is applied to both the standard reference (standard number) and the standard title. It is also possible to apply a filter on your Favourites group.

Here are some examples to illustrate searching:

			TestWise 2	015 - Test Analysis Soft
ile Test				
save Save	1. Select Standard			
🔄 Save As				Search
😚 Open	iup 🗶			Jen of
5 Close	ND X			
Recover Tests	Group	Test Type	Material	
fo				
cent	Favourites Built-in	Tensile Tear/Peel/Adhesion	Waven	
	Custom	Seam	Coated/Laminated	
w		Attachment	Leather	×
an dards		Compression Stretch/Recovery	Yarn/Thread Koitted	
int		succentrations	Roorcovering	
			Component	[
rification	EN ISO 23910:2007 (IUP 44)			
bug	Leather - Physical and mechanical tests - Measurer			
Options	EN ISO 3376:2011 (IUP 6) (large test piec Leather - Physical and mechanical tests - Determin		nsion	
Exit	EN ISO 3376:2011 (IUP 6) (standard test			
	Leather - Physical and mechanical tests - Determin		nsion	
	EN ISO 3377-1:2011 (IUP 40-1) (large test			
	Leather - Physical and mechanical tests - Determin	ation of tear load - Part 1: Single edge tear		
	EN ISO 3377-1:2011 (IUP 40-1) (standard Leather - Physical and mechanical tests - Determin			
	EN ISO 3377-2:2002 (IUP 8)			
	Leather - Physical and mechanical tests - Determin	ation of tear load - Part 2: Double edge tear		

Typing *IUP* and clicking Search and also clicking Leather will find all standards with *IUP* in the reference/title which are classified as being standards for testing Leather.

Test	TestWise 20	15 - Tiest Analysis Softv
Save Save As Open Close	1. Select Standard [[Search
ent v	Collepterson and roman Directs/Infectory Politika Graposest Factoria Graposite Composite Composite Polici Robor Robor Tays	*
Ification Nug Options	ASTM.D+533-11 Traperosi Tearing Torength of Geotenties ASTM.D+523-08 Geotenties	
Exit	ASTM.D4833-07 Index Puncture Besistance of Geomembranes and Related Products	
	ASTM D5884-04a (2010) Determining Tearing Strength of Internaty Reinforced Geomembranes	
	ASTM. D6241-04 (2009) Static Functure Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe	
	ASTM. D6636-01 (2011) Determination of Ply Adhesion Strength of Reinforced Geomembranes	
	ASTM D7005-03 (2008) Determining the Band Strength (Ply Adhesion) of Geocomposites	

Typing *astm* and clicking Search and also clicking Tensile and Geotextile will find all standards with *astm* in the reference/title which are classified as being standards for the tensile testing of Geotextiles.

est			TestWise 2	015 - Test Analysis Sof
1. Select Standard				
				Search
en 🗙 71 🗙				
Group		Test Type	Material	
Favourites	*	Tensile	Waven	
Built-in	Ø	Tear/Peel/Adhesion	Norwoven	
Custom		Sean Attachment	Coated/Laminated Leather	
		Compression	Yarn/Thread	
		Stretch/Recovery	Knitted	
			Flaorcovering	
			Component	
EN 13571:2001				[
	for uppers - Tear strength			
EN 71-1 (Compressi Safatu of Isura - But 11	on Test: 110N) echanical and physical prope	rtier		0
		1.045		
EN 71-1 (Seam Test Safety of toys - Part 1: /	echanical and physical prope	rties		[
EN 71-1 (Seam Test	(VS)			
	iechanical and physical prope	rties		L
EN 71-1 (Tension Te	st)			[
Safety of toys - Part 1: /	echanical and physical prope	rties		
EN 71-1 (Tension Te				[
Safety of toys - Part 1: A	iechanical and physical prope	rties		

Typing *en* and 71 followed by clicking Search will find all standards with *en* and 71 in the reference/title.





Clicking *Stretch/Recovery* and *Knitted* will find stretch & recovery standards for knitted fabrics.

Typing *NEXT* and also clicking Tensile will find all standards with *NEXT* in the reference/title which are tensile tests.

NEXT® TM27 (January 2008) DETERMINATION OF BREAKING STREM

NEXT® TM36 (January 2008) BRAWIRE PENETRATION

Debug

📝 Optio

TH AND ELONGATION OF W

IEN FABRICS (REVELLED STRIP

Your Favourite Standards in One-Click

The concept of Favourites is well known when we use web browsers. In TestWise we can add or remove any standard to our Favourites group and use the Favourites shortcut to display only our favourite standards.

A collection of standards can be grouped together in a Favourites Group.

If you make a lot of tests for a specific retailer you may want to add their standards/test methods to a named Favourites Group.

Favourites are saved individually for each user.



To add a standard to your Favourites group, simply check the box.

Favourites are always shown in bold and with a star.



File Test				TestWise 2015 -	Test Analysis Softwa
Save Save As Open	1. Select Standard Refine your results				Search
🖆 Close 🕂 Recover Tests	Group		Test Type	Material	*
Info	Favourites 3	(*	Tensile Tear/Peel/Adhesion	Waven Norwaven	
Recent	Custom		Seam Attachment	Coated/Laminated Leather	
Stan dards			Compression Stretch/Recovery	Yarn/Thread Knitted Floorcovering	
Print				Component	w
Verification	ASTM D2261-13 (IP units) Tearing Strength of Fabrics by the Tongue (Si	ingle Rip)	Procedure		★ 🗹
Debug	ASTM D5034-09 (2013) (20s) (IP uni Breaking Strength and Elongation of Textile F		Srab Test)		* 🗹
🕹 Exit	EN ISO 13934-1:2013 Textiles - Tensile properties of fabrics - Part 1	1: Deter	mination of maximum force and elongation	at maximum force using the strip method	★ 🗹
	EN ISO 13937-2:2000 (auto-stop) TextRes - Tear properties of fabrics - Part 2:1	Determi	nation of tear force of trouser-shaped te	st specimens (Single tear method)	* 🗹

To show only your Favourites, click the Favourites group filter.

You can add or remove Favourites at any time by unchecking the box.

For example, if you wanted to select a tensile test for NEXT then would click Favourites followed by the Tensile filter.



You then simply click the standard required and start testing.

Favourites

Creating Favourite Groups for Standards

∎ File Test		
₩ Save Save As C Open Cose	1. Select Standard Refine your results	To create a new Favourites Group then click on the star+.
+ Recover Tests	Group Test Type Favourites Built-in Add New Favourite Group Custom	Group
New	Attachment Compression Stretch/Recovery	Favourites 👷
Stan dards Prin t	Suectionecovery	Built-in Add New Favourite Group
Verification	16 CFR 1500.51-53 Tension Test Test Methods for Simulating Use and Abuse of Toys and Other Articles Intended for Use by Children	Custom
•	Add New Favourite Group p Name Enter name for this favourite group Right click the Standard to add to your favourite group OK Cancel Add New Favourite Group Add New Favourite Group Mame Next Right click the Standard to add to your favourite group OK Cancel OK	Type a name for the Favourites Group.
Group		
Favour	ites 🖕	
Built-ir	n 🌽	
Custor	n	
Next		The new Favourites Group name is now shown in Groups.
		Right click on any standards you want to add to the Favourites Group and then click in the box Add to Group.
	16 (January 2008) TH & SEAM SLIPPAGE OF WOVEN FABRICS	
STOL STRENOT	Add to	o Group: Next



To show only the standards in the Favourites Group, click on the Favourites Group name.

Only the standards in the Favourites Group are now listed.

To Edit a Favourites Group, either to change its name or remove (delete) the group, then click on the cicon and select the group name.

INTRODUCTION TO T27 PNEUMATIC GRIPS

T27 Pneumatic Grips can be used up to 5000N. Typical uses include tensile strength, tear strength and seam slippage tests.

T27 is supplied as a pair of grips, complete with 4 of 100 x 30 mm rubber jaw faces and 2 of 25 mm x 25 mm rubber jaw faces.

25 mm x 25 mm are typically used for grab tensile and seam tests.

The rear jaw face is pneumatically actuated while the front jaw face is static. The position of the front jaw can be adjusted using the knurled knob dependent upon the thickness of the specimen.



To change a jaw face, simple pull to the side and it will be released.

Slide the alternative jaw face over the dove-tail and ensure it locates correctly on the ball.

QUICK START

The Essential Elements of TestWise

The following section will guide you quickly through the simple steps of carrying out a tensile strength test on a woven fabric and illustrate the use of the essential features.

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Login to TestWise.

Click the New button.

Use the search filters to locate the Standard you require.

For this example we will select EN ISO 13934-1 with a 200mm Jaw Separation.

2. Enter Test Details



Required Information



Select a suitable Jaw Scheme, in this case T27.

It is important that the selected Jaw Scheme matches the Jaws actually fitted to Titan. If they do not match then the Jaw Separation will be incorrect or damage to the instrument could occur.

Change the Jaw Scheme by selecting from the drop down list.



Hovering the mouse over $\underline{T27}$ will show you an image of which grips or fixtures you have selected.

The image will stay on screen for 5 seconds.

Click the Confirm button to enable the Start button.

The Start button is enabled.

The Jaw Separation can be changed if required.

The default setting is 200mm.

100mm is used for stiff fabrics.

If required, select the required Pretension force, determined by the weight of the fabric (area mass).

2. Enter Test Details	1	Select the Speed required.
	: [72] Tora Jan: [72] Bottom Jan: [72] Edition Jan: [72] (200.00 Manual mm @ (24) ± 200g/m ⁴ @ 100.00 Manual mm/min 100.00 28.00 Manual mm/min Start	In this case, the common default speed is 100 mm/min. However, some tests require a slower speed of 20 mm/min.
. Enter Test Details Required Information Jaw Scheme: Jaw Separation: Pretension:	n 127 Precmats: Grips 58N Top Jane 122 Battem Jane 122 200.00 (2N) ≤ 200g/m ⁴ 306.8 Manual mm/min Start	If a non-standard speed is required, click Manual and type in the required speed. Click Manual again to revert to standard speed selection.
– Optional Informat Test Name Customer Reference Material		Enter details which describe the sample. This information will be stored with the test results and printed on the Test Report. These fields can be left blank and populated at any time via File > Info > Edit. See below.
Pile Test File Test File Save Save Save Sorre Sorre Standards Print Image: Sorre Standards Print Image: Sorre Image: Sorre Sorre	Test Wrise 2013 - Test Analysis 5 Results Test Details Test Name: Example Tensile Test Customer: ABC Fabrics Reference: P0123455789 Material: CP6020 Comments: Bleached Only Specimens: 5 Required Directions: Both Jaw Scheme: T17 Jaw Separation: 200.00 mm Load Cell: 600 N Load Ce	 This information can be edited at any time. After making any changes, click Apply. To exit without saving changes, click Cancel.

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- Standard Customisation			
Number of Specimens:	5		0
Directions:	Both -		0
Break Detection:	10	%	0

Standard Customisation can be used

to change some aspects of the test such as the number of specimens

tested (assumed to be the same number on both directions), which directions are tested, Break Detection.

Titan automatically detects a break when a percentage force drop greater than or equal to the Break Detection value occurs.

To commence the test, click Start.





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Place the specimen centrally in the top jaw and close.

Place the specimen centrally in the bottom jaw and without tensioning the specimen, close the bottom jaw

If while loading the specimen into the jaws you make a mistake (for example, the specimen is not central) you can open the jaw by clicking the appropriate button on screen, pressing F2 or F3 on the keyboard.

Alternatively, if you press and hold the Titan Start Button or the Foot Pedal for 2 seconds or more then the last jaw action will be undone.



Click Run or press F9 on the keyboard to start the test.

Note that the purpose of the Function Keys changes dependent upon the task being undertaken.

On the right hand side of the **TestWise** screen you will see a notifications of the Current Task.

Throughout the test this can change many times and these are some of the more common examples.

This is a specimen in progress.

If the plot goes off scale on either axis then the graph will rescale in real time.

You can also see an area called Titan Data. This is displaying elapsed time, extension and force. The units are dictated by the Standard by default but can be changed if required.







700

In this example of a tensile strength test we are using the Break Detection feature.

This means the specimen break is detected automatically. When this occurs the test will end and if pneumatic jaws are being used, they will open.

The Current Task now shows the Force and Extension (green text).

The user now Accepts the test, with or without Observations.

Accepting saves the data and then moves on ready for the next specimen.

At this stage the test can also be rejected.

Specimens can also be deleted later.

As you proceed through the test specimens you will see the test results accumulating on the left hand side of the **TestWise** screen. For convenience the mean (average) result is also shown.

Mean

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Test Completed View Results
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bort Export ata Excel Add Specimen + Content of the specimen - Content
▼ [#] Graph Results
Unit Ord Desc Desc Desc Control
Standard, Dr. 50. 1764 (2013) (200vv) Teel News Lawyin Teels Teel II.
Add Delete Reset Select Show Data Offset Specimen + Test

When all specimens have been completed, the green banner advises you "Test Completed".

To see the Results, click the View Results button in the green banner.

Clicking View Results is a time saving shortcut. All the specimens will be selected for statistical calculations.

You can also click the Results tab but this does not automatically select specimens.

Each specimen is assigned a colour as shown here. For example, the red graph corresponds to the red results.

Up to ten (10) colours can be defined. If you have more than ten (10) specimens, the colours start again from the beginning.

To switch between displaying Results or Graphs, click the Results or Graph tab.

Click Offset on the Ribbon and this dialog is shown. Type in a suitable value. To cancel the Offset, click Offset again.


Enter an extension value to offset the curves.

Curves can also be sorted in ascending or descending order.

Here are the results with the graphs offset. This is useful when comparing the shape of the curves.

To add Observations check the box on the Ribbon.

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👿 Elongation at Max. Force	🔲 Time To Break	☑ Observations
Force at Rupture	Force at 0.00 %	\sim
	Columns	

To display any additional Statistics, check the boxes in the Ribbon. As soon as the box is check (or unchecked) the statistics will update.

🖌 Mean	🔲 Range	Conf Limits
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To change the force units ...

To change the extension units ...

To select only one direction ...



You can select a range of specimens by clicking on the first and shift-clicking on the last.



To select a discontinuous range use control-click, that is, click on each specimen while also holding down the control (CTRL) key.

To view the Test Report, click Print. This will take you to the Print Preview.

You can change:

- the default font and size
- add a logo
- choose the details in the Test Report
- change the view
- print a hard copy or PDF

Another view.

Note the page and zoom controls here.



Another view.

Clicking Print will now bring up the Windows Print dialog.

To Save the test data, select Save, Save As or Close from the File menu.

If you choose Save or Save As, the save dialogue will be displayed.

+ Recover Tests

Info



Congratulations !

You have now completed your first test using **Titan** and **TestWise**.

MAKING CHANGES DURING THE TEST

During a test it is sometimes necessary to change some of the details. This could be changing the number of specimens to be tested, deleting a specimen, adding a specimen, changing the break detection setting or changing the sample description or references (titles). This section shows how these changes can be made.

Changing the Number of Specimens

Test Name	Example Tensile Test	
Customer	ABC Fabrics Ltd	
Reference	P0123456789	
Material	100% Cotton twill	
Comments	Dyed and Finished	

The Optional Information (or titles) can be added either at the start of the test or any time after.



0

By default, the selected Standard requires 5 specimens to be tested in each direction.

To change the number of specimens, press F12 or click Stop.



The test details will be displayed.

Edit the number of Specimens (and any other details) then click Apply.



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S 🔚 📨 🔻	Results
Start Stop Observe	Top Sottom Run L Jaw Lu Machi
Specimens	~ ‡
Warp	r i
1	45.60 kgf
2	45.47 kgf
3	45.84 kgf
Mean	45.63 kgf
Weft	
→ 1	
2	
3	
Mean	-

Any test results associated with specimens 4 and 5 would be lost.

Click Start to continue testing.



Adding a Specimen



To add a specimen, click the Add Specimen button. You can add specimens to just one direction or both directions.

In this case, we are showing specimens being added to the weft direction.



An additional specimen has been added to the weft direction.

Click Start to continue testing.





USEFUL FEATURES

Selecting Jaw Schemes

Selecting the correct Jaw Scheme is an import part of the test procedure.

The user must advise TestWise which jaws or other tooling is connected to Titan in order ensure the correct jaw separation (gauge length) is obtained.

If there is a mismatch then the consequences could range from incorrect jaw separation to damage to the attached tooling and load cell !





If the mouse is hovered over Top Jaw: $\underline{T17}$ then an image of the jaw is displayed for 5 seconds.

2. Enter Test Details



If the mouse is hovered over Bottom Jaw: T17 then an image of the jaw is displayed for 5 seconds.

Show Data Points

Sometimes it is desirable to know the force and extension values of an exact point on the graph. Look at the screenshot below, we want to know the exact force and extension values at the point indicated by the red arrow.



Click Show Data Points on the TestWise ribbon.

Using the mouse, point the precise location on the graph and a popup will be displayed with the required information.



To switch back to a normal graph, click **Hide Data Points**.

Find Force or Find Extension

Find Force at a specified extension and/or Find Extension at a specified force are often requested in buyer's specifications. For this reason we include this feature in many tensile standards.



Select the specimen or specimens.

If it is not already selected, click Results Settings.



 Results Settings

 Find Force At:
 5.00
 %

 Find Extension At:
 20.00
 kgf

 Image: Max Force
 Time To Break
 Observations

 Image: Extension
 Image: Force at 5.00 %
 Energy At Break
 Extension at 20.00 kgf

 Image: Columns
 Columns
 Columns
 Columns
 Columns



Extension at which to find force.

Force at which to find extension.

The values will be reflected in the Ribbon.

Check the required results.

If a single specimen is selected the graph will show the specific overlays.

This graph was copied using the Copy Graph feature which copies the graph as it is currently displayed.



Continued in next section.

Auto Hide Panes

The results for All Specimens would be displayed like this:

File Test F	Results			Tes	stWise 2013 - Test Analy	rsis Software					
Print Copy Graph Results General	Export Data	 AL + Test 	ow Data Offset Points	tension % ▼ Force kgf ▼ Units	Max Force Katension Energy At Break	 □ Time To Break ☑ Force at 5.00 % ☑ Extension at 20.00 kgf Columns 	Observations	Mean Min] Conf Limits] Coeff Of Var	
pecimens		Graph Resu	lts								-
Warp	44.98	Warp Results									
2	44.96		Max Force (kg)	Extension	(%)	Force at 5.	00 % (kgf)	Extension at 20.0	00 kgf (%)
3	43.79		44.98		6.25		34.75			3.15	
Mean	44.53	kgf 2	44.83		6.30		35.57			3.18	
Veft		3	43.79		6.17		34.85			3.17	
<mark> 1</mark>	30.04	(gf Mean	44.53		6.24		35.06			3.17	
2	30.09	Cont Limits	±1.61		±0.17		±1.11			±0.04	
3 Mean	31.29	Coeff Of Var	1.45%		1.12%		1.28%			0.53%	
mean	30.48	Weft Results									
		Specimen	Max Force (kg)	Extension	(%)	Force at 5.	00 % (kgf)	Extension at 20.0	00 kgf (%)
		1	30.04		6.26		23.90			4.32	
		2	30.09		5.84		25.05			4.16	
		3	31.29		6.29		24.71			4.19	
		Mean	30.48		6.13		24.55			4.22	
		Conf Limits	±1.76		±0.63		±1.46			±0.21	
		Coeff Of Var	2.32%		4.12%		2.39%			2.00%	
Standard: EN ISO 13	934-1-2013 (200mr	n) Test Name: Exa	mple Tensile Tes	#2						Jaw Scheme: T	17 Load Cell: 60



The Titan Data / Results Settings panes can be hidden (as shown above) by clicking the Auto Hide pin.

The Specimens pane can also be hidden in the same way.

This is useful if you are displaying a large number of results columns and the display becomes congested.

To restore the panes click the Auto Hide pin again.

	_	_			x
Mean Min Max	Median	Conf Limits Coeff Of Var			
	Results Sett Find Force Find Exte	e At:	5.00 20.00	v + % kgf	Titan Data
					Results Settings

Copy Graphs, Copy Results and Export Data



You can find these features in the General section of the Results ribbon.



Copy Graph and Copy Results will copy the Graph or Results as they are currently displayed.

They are copied to the Clipboard ready for pasting into other application.

Warp Results

Specimen	Max Force (kgf) Extension (%) Force at 5.00 % (kgf) Extension at 20.00 kgf (%)
1	44.98	6.25	34.75	3.15
2	44.83	6.30	35.57	3.18
3	43.79	6.17	34.85	3.17
Mean	44.53	6.24	35.06	3.17
Conf Limits	±1.61	±0.17	±1.11	±0.04
Coeff Of Va	r 1.45%	1.12%	1.28%	0.53%

	А	В	С	D
1	0.008725	0.250206	0.009038	0.236624
2	0.057333	0.261625	0.057035	0.287539
3	0.095659	0.269786	0.09537	0.29637
4	0.13305	0.310865	0.133394	0.329989
5	0.183529	0.427099	0.18326	0.404291
6	0.220608	0.545236	0.22066	0.561924
7	0.257999	0.589574	0.258372	0.632191
8	0.308478	0.653217	0.308551	0.688846
9	0.345557	0.872515	0.345639	0.841865
10	0.382948	0.921892	0.383351	0.956911
11	0.433115	0.975867	0.433217	1.032157
12	0.470506	1.145894	0.470618	1.358401

Export Data exports the raw extension and force values for each specimen to a comma separated value (CSV) file which can be opened in Microsoft Excel.

There are no column headings.



Reset



Reset is a time saving feature which can be accessed from the Test and Results tabs.

Reset the selected specimens or the entire test. This will delete all data, results and recorded observations.

There are two Reset options, both of which should be used with caution.

Before using Reset ensure you save any important results.

This option is like deleting specimens.

After saving your test results, to carry out another test with the same standard and settings then select Reset Current Test.

Answer "Yes", the default response is "No".

Ensure you save changes to your previous test.

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Manual Control

This option is used to manipulate Titan outside of a normal testing routine. It is not designed for performing tests.

	TestWise Options
General Graph	Commands for manual control of Titan
Jaws Jaw Schemes Load Cells TestWise Settings Titan Settings Users Manual Firmware	Load Cell: x 600.00 mm Pore: Querte Control Nome Image: Control Image: Control Image: Control Image: Contro Image: Control <tr< td=""></tr<>
	Apply OK Cancel

Load Cell: Position: Force:	5000 N 400.00 mm 0.0000 N	Live Data showing the currently connected loadcell, current position and current force are displayed.
Home		Sends the carriage to the top of the column, the Home Position.
Tare Loadcell		Tares the loadcell reading, resets the force to zero.
Stop		Stops the carriage if it is moving.
Top Jaw	Bottom Jaw	Used to open or close the jaws.
		Used to move the carriage up or down and various speeds set by the slider.
		The 4 arrow keys on the keyboard can also be used.
Jog Down 100.00 mm/min		

Collapse and Expand

Some sections of the display can be expand or collapsed to create more space on screen. This example shows the Enter Test Details sections when preparing for a new test.

- Optional Information		
Batch Nbr:		
Customer:		
Quality:		
Shade:		
Comments:		
+ Optional Information		
+ Standard Customisation		
- Standard Customisation		
Number of Specimer	is: 5	0
Direction	s: Both 🔹	0
Break Detectio	n: 5	% 🕕

This section can be collapsed by clicking anywhere on the bar.

Standard Customisation can be expanded by clicking anywhere on the bar.

To reverse the expand or collapse, click the bar again.

USING THE STANDARDS EDITOR

Creating Custom Standards

You can create a Custom standard (or "user-defined standard) by copying a Built In standard. Built In Standards are those which are supplied by James Heal and installed with **TestWise**. You can Copy Built In Standards but you cannot edit them. Once a Custom Standard is created, you can edit or copy it.

Creating a Custom Standard is useful for creating both simple and complex standards. The system relies on editing a pre-existing Standard, therefore, Standards cannot be created from a blank template. This means you must choose a Standard which most resembles what you want to do and then use this as your template. In cases where this is not possible, please contact James Heal for help and advice.

In the following example we are going to create a new tensile test.



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Sectional description of the section of the sect	The parameter settings for the selected Standard are displayed.
Edit Standard — General Settings	1
Name: ISO 13934-1 (MOD)	Type in a Name and Description for the new Standard. We have also reduced
Description: Tensile Strength and Extension	the number of specimens from 5 to 3,
Number of Specimens: 3	
Directions: Weft •	9
Jaw Separation: 200.00 mm	
Units: Select	
Directions: Both 🔹	We only want to test specimens in the
Warp	weft direction.
Jaw Separation: Weft mm Both Units: Select	
General Settings	
Name:	
Description:	
Number of Specimens: 3	
Directions: Weft 🔹 💿	To change the units used in the standard
Jaw Separation: 200.00 mm	click Units: Select.
Units: Select	
Select Units	
Position: mm 🔻	
Extension: mm •	
Force: N	
Speed: mm/min 👻	
Linear Density: tex	
OK Cancel	

Select Units	×
Position:	mm 👻
Extension:	m mm cm
Force:	in
Speed:	mm/min 🔻
Linear Density:	tex 🔹
ОК	Cancel
Select Units	×
Position:	mm 🔹
Extension:	mm 🔹
Force:	m mm cm
Speed:	in %
Linear Density:	tex 🔹
ОК	Cancel
Select Units	×
Position:	mm 🔹
Extension:	mm 🔹
Force:	N -
Speed:	cN mN
Linear Density:	kgf
	gf
ОК	

Position units.

Extension units. Note "%" is also available.

Force units.

Select Units				
Position:	mm 🔻			
Extension:	mm 🔻			
Force:	N •			
Speed:	mm/min 🔻			
Linear Density:	mm/min mm/s cm/min			
ОК	cm/s in/min	hl		
	in/s	Ľ,		
Select Units	<u> </u>			
Position:	none			
Extension:	tex dtex den			
Force:	NeC Nm			
Speed:	NeK NeW NeL			
Linear Density:	tex •			
		_		
ОК	Cancel			
– General Settings				
Name:				
Description:				
Number of Specimens:	3		0	
Directions: V	Veft	•	0	
Jaw Separation:	0.00	in		
Units:	select			
 Procedure Settings 				
-	5	%		•
Break Detection: Pretension:	(2N) ≤ 200g/m ²	%		0
Break Detection:	(2N) ≤ 200g/m ²	% • Edit m	m/min	••

Speed units.

Linear Density is only used in Yarn Tensile Strength tests. If a linear density is specified the results are expressed as tenacity. If no linear density is specified, the results are expressed directly as force.

Enter a Jaw Separation (also known as Gauge Length or Gage Length). In this example we are setting a value of 10 inches.

If required, change the: break detection setting default pretension setting speed

Pretension:	(2N) $\leq 200g/m^2$ •	
	No Pretension (pretension off)	
	(0.5N) Fabrics with stretch	
	$(2N) \le 200g/m^2$ (5N) > 200g/m ² to 500g/m ²	
	(10N) > 500g/m ²	
Speed: 100.0 20.00 100.0	00 Edit mm/min	If the fabric has an extension at break of less than 8% then change the speed to 20 mm/min.
💿 Edit Opt	tions	
		Alternatively, different speed values can be specified by clicking Edit which
Units: N		displays this dialogue box.
1:	20.00 Delete	
2:	100.00 Delete	
	New	
	OK Cancel	
Section 2015 Secti	tions	
Units: N		
1:	50.00 Delete	You can change the existing speed
2:	100.00 Delete	options or add a New option.
3:	300.00 Delete	
	New	
	OK Cancel	
Sedit Opt	tions	
Units: N		
1:	100.00 Delete	Pressing Delete will remove the specified option.
2:	300.00 Delete	option.
	New	
	OK Cancel	

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— Result Settings		
	Max Force Extension Forey At Break Time To Break Force at 0.00 mm Extension at 0.00 N Observations	
Statistics:	Mean Min Max Range Median Std Dev Conf Limits Coeff Of Var	
Find Force At:	0.00	mm
Find Extension At:	0.00	Ν
- Result Settings		
Columns:	Max Force Xtension Energy At Break Time To Break Force at 10.00 mm Xtension at 250.00 N Observations	
Statistics:	✓ Mean Min Max Range Median Std Dev ✓ Conf Limits ✓ Coef of Var	
Find Force At:	10.00	mm
Find Extension At:	250.00	Ν
Tie Test		
Select Standard	Edit Standard + General Sectings	
Com Refine year results		
	Raterial Apply + Result Settings	
Recent Persuites Tessile New Bullt-is Tessile	Wown Cancel	
Identifiantia Identifiantia Polot Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia Identifiantia	Costed (Laskeded Leather Yars/Thread	
Verification Debug	Tennessen Congusted Fastmear Executed Andread	
🥩 Options	Gentextile/Related Compatie	
Rev D 1986 - (2001) (ROhm)		

Change which Results and Statistical values are selected and displayed.

Selected Find Force and Find Extension.

Selected Confidence Limits and Coefficient of Variation.

Specified default Find Force and Find Extension values. These can be changed at test time.

Click Apply to save the new Standard.



<u>Cancel</u>

Your new standard is now available in the Standards Library ready to make a new test as normal.



Custom standards can be found quickly by clicking the Custom Group.

SETTING UP A NEW JAW SCHEME

Any Jaws which are purchased at the same as the **Titan**⁴ instrument will be configured ready for use. However, Jaws purchased subsequently need to be setup manually using the following instructions. In addition you may wish to set up unusual combinations of Jaws to provide the best gripping and holding options for the specimen under test.

In this example we will pair T18 and T17 Jaws.



First, provide enough space between the top and bottom Jaw connection to be able to fit the new Jaws.

From TestWise File > Options > Manual

If the instrument has not been "Homed" since switch on then click the Home button.



Then use the Jog Up and Jog Down buttons to move the top and bottom Jaw connections to a suitable position for fitting the new Jaws.

TestWise Options		1000	and a state of the		-
General Graph	(Configure	jaws schemes			
Jaws		New Delete			Jog Mode
Jaw Schemes	T5		Name:	T17	
TestWise Settings	T17 LC		Description:	Universal Pneumatic Jaws	
Titan Settings	T20A		Reference Position:	559.06	mm
Titles	T208		Custom Offset:	0.00	mm
Users	T18-8		Load Separation:	0.00	mm
Manual Firmware	T4 T17		Top Jaw:	T17	•
rimware	T17 W		Bottom Jaw:	T17	•
	T17		Mode of Operation:	Tension	
	Current Jaw Scher T17				
]				Apply OK	Cancel



Move to Jaw Schemes in TestWise Options.

The list shown here are the Jaw Schemes currently set up:

T5
T17 LC
T20A
T20B
T22
T18-8
T4 T17
T17 W
T17

To begin the process of creating a new Jaw Scheme, click the New button.

Enter the details required.

Enter a Name and Description for the Jaw Scheme.

Reference Position, Custom Offset and Load Separation will be covered later.

Select the Top Jaw and Bottom Jaw from the drop-down lists.

Select the Mode of Operation: Tension or Compression:

This selection dictates the direction of movement of the carriage.

Selecting Tension results in the Carriage moving up, selecting Compression results in the Carriage moving down.





General Graph	Configure jaws schemes
Jaws	Save Reference Position Go Back
Jaw Schemes	
Load Cells	
TestWise Settings	Jog Up
Titan Settings	534.38 mm
Titles	0.02 N
Users	
Manual	Jog Down
Firmware	Jog Dawn
	100.00 mo/min
	Apply OK Cancel

To set the Reference Position, select Jog Mode.

The Reference Position is the point at which the top and bottom Jaws just touch without producing any force on the Load Cell.

Using the Slider, set a suitable speed, e.g., 100 mm/min.

Custom Offset

Some Jaw Schemes require a Custom Offset because the "nip" points cannot be brought together.

In this case the Custom Offset is 17.5mm.



Use the Jog Up and Jog Down buttons to move the Top Jaw carefully downwards until it just touches the Bottom Jaw without producing any force on the Load Cell.

As the Top and Bottom Jaws come in close proximity you can reduce the speed.

Once the Jaws are touching, click the Save Reference Position button, then the Go Back button.

Jaws				
	New Delete		Jog	Node
Jaw Schemes	T5	Name:	T18-8 T17	
Load Cells TestWise Settings	T17 LC	Description:	T18-8 Top T17 Bottom	
Titan Settings	T20A	Reference Position:	534.38	mm
Titles	T208 T22	Custom Offset:	17.50	mm
Users	T18-8	Load Separation:	0.00	mm
Manual Firmware	T4 T17	Top Jaw: 1	T18-8 👻	
irniware	T17 W	Bottom Jaw: 1	T17 •	1
	T17 T18-8 T17	Mode of Operation:	Tension 👻	1
	Current Jaw Schemes TV			

Т5	Name:	T20A	
T17 LC	Description:	T20A Ball Burst (Compression)	
T20A T20B	Reference Position:	562.72	mm
T22	Custom Offset:	0.00	mm
T18-8	Load Separation:	250.00	mm
T4 T17	Top Jaw:	T20Aball	•
T17 W	Bottom Jaw:	T20Ash	•
T17		Commentation	
T18-8 T17	Mode of Operation:	Compression	•

You can see that the Reference Position has been saved (534.38 mm).

To finish, click Apply and OK.

The "T18 T17" Jaw Scheme has now been created and set up.

Load Separation is used mostly in compression tests when the tooling may be dangerous or prevents loading a new specimen.

When the test has completed, the carriage will move up, 250 mm in this case, providing good and safe access to the specimen holder.

USING THE NEW JAW SCHEME





Place the specimen on the bar.

Using the Jog Down button (or Jog Up button if required), move the Top Jaw until the specimen can be gripped by the Bottom Jaw.



Current Task		
Set Jaw Separation Use the buttons below to set the jaw separation		
Jog Up		
Jog Down		
100.00 mm/min		
Save Jaw Separation		
Titan Data Results Settings		

When the position is suitable, click the Save Jaw Separation button.

Save Jaw Separation

This Jaw Separation will now be used during the test.

Note: the Jaw Separation can only be set manually for the first specimen.

Continue testing as usual.

T19 CALIBRATION CHECK WEIGHT SET

The T19 Calibration Check Weight Set should be used periodically, between annual loadcell calibrations, to determine the load reading accuracy on the **Titan**⁴ Universal Strength Tester.

The T19 Calibration Check Weight Set *cannot* be used on Titan¹, Titan² or Titan³. If you require a Check Weight Set for these models then contact your James Heal Agent and ask for 794-817.

Instructions for Use

Power on the Titan instrument and start the TestWise software and Login as normal.

Allow the instrument 30 minutes to "warm up" so that the loadcell and its associated electronics stabilise at room temperature. This is good practise in general whenever you are using Titan and is always done prior to calibration.



Remove both the top and bottom jaws from the screw thread adaptor.

Fit the Check Weight Holder in place of the top jaw. This allows the five circular weights to be centrally positioned below the loadcell.



0

Apply OK Cancel

Wise (

3

General

Jaw Sche

Load Cells TestWise Settings Titan Settings

Titles

Users Manual Firmware

Graph Jaws the for manual control of TRan Load Cell: 600 N Position: 500.00 mm Force: 0.00 N Home Torce: 0.00 N Home Torce: 0.00 N Home Torce Toro Barry Return Jave

From the File menu, choose Options, then Manual.



Click Tare Loadcell to zero the loadcell reading.





One at a time, carefully place all 5 circular check weights on to the Check Weight Holder, ensuring they are mounted centrally.

Record the Force reading after the $\underline{\text{fifth}}$ (final / last) weight has been added.

First weight:

Load Cell:	600 N
Position:	572.55 mm
Force:	10.01 N

Second weight:

Load Cell:	600 N
Position:	572.55 mm
Force:	20.02 N





Third weight:

Load Cell:	600 N
Position:	572.55 mm
Force:	30.03 N

Fourth weight:

Load Cell:	600 N
Position:	572.55 mm
Force:	40.04 N

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The fifth and final weight:

Load Cell:	600 N
Position:	572.55 mm
Force:	50.05 N

The total force added is 50N. The load reading on the screen should confirm this. You can use this value to determine the accuracy of the calibrated loadcell fitted to **Titan**. For 0.5% this value should be between 49.75 N and 50.25 N.

In your log you should record:

- Date and time
- Loadcell capacity and serial number
- The final reading from all 5 weights
- Pass / fail according to the tolerances above
- Initials of the operators carrying out the check

If the reading is out of tolerance and the loadcell fails the check, please repeat the check to ensure no errors have been made in the procedure. If the loadcell still fails the check, please contact your James Heal Agent to arrange for recalibration.

APPLICATIONS

This section of the Operator's is to provide an insight into Testing on Titan. It is by no means an exhaustive compilation of examples but hopes to give users and operators an understanding of the use of Titan and TestWise along with the specific tooling used in the examples.

It is import when carrying out any tests to consult an up-to-date copy of the relevant standard. The actual standard contains a wealth of detail which it is not possible to cover in this Operator's Guide and furthermore standards are constantly being revised and updated.

The applications covered in this section are based on textiles and leather, and the majority of textile tests are designed for the testing of fabrics, either woven, knitted or nonwoven.



This camera indicates that the Operator's Guide CD contains a movie relevant to the discussion. The movie files are in wmv or avi formats and require the appropriate media player to view them, e.g., Windows Media Player. Most of the videos do not require sound speakers.

Tensile Strength and Elongation

A wide variety of techniques have been developed to measure tensile strength and elongation. Two very popular methods are described below. Strength tests for yarn are covered separately later in this section.

Fabric – strip test

This example is based on ISO 13934-1.

The specimen is approximately 300mm in length and threaded down to a width of 50mm. If the fabric cannot be threaded down then it can be carefully cut to 50mm. The gauge length, or initial jaw separation is typically 200mm.



6 6

9990 0 899

450 -400 -350 -300 -250 -250 -250 -250 -250 -

The Operator's Guide CD contains a simple movie of this test.

900

v v As	1. Select Standard			2. Enter Test Details	1	
en	Refine your results		See	ch Required Informatio	n	
059	13934 🗙			Jaw Scheme	Oniversal Presentatic Java	
	Group	Test Type	Material			
et	Farourites	Terraite Tear (Deal) Advanian	Woven	Pretension:	(2N) x 200g/m ³ *	
	Built-In Custom	Tear/Peel/Adhesion Seam	Nonwoven Control/Lawinsted	Speed	100.00 • Manual	mm/min
fards		Attachment	Leather			
		Compression Stretch/Becavery	Yarn/Thread Keitted			•
ptions			Recovering			Start
a.			Component			
			Geotextlie/Related	- Optional Informat	tion	
			Composite	Test Name:	Example Tensile Test	
	EN ISO 13934-1:2013 (100mm) s of febrics - Part 1: Determination of maxi			ABC Fabrics	
	using the strip method	L OF FADRICS - Part 1: LARGEMENADOR OF MAX	nun torce and ecorgation at nacimum t		P0123456789	
	EN ISO 13934-1:2013 (Textles - Textle properties using the strip-method	200mm) s of fabrics - Part 1: Determination of maxi	num force and elongation at maximum f	Ree Material:	CP6820	
	EN ISO 13934-2:1999 (Textiles - Tensile properties	100mm) s of fabrics - Part 2: Determination of maxi	num force using the grab method	Comments:	Beached Only	
	EN ISO 13934-2:1999 (Truties - Teode asserties	75mm) s of fabrics - Part 1: Determination of maxi	num force using the arab method	+ Standard Custom	isation	

Search for **13934** and select the correct option. Select the correct Jaw Scheme, in this case T17.

Set the Pretension value based on the fabric weight.

Speed defaults to 100 mm/min but there is an option of 20 mm/min which is used for fabrics which show very little elongation.

Speed:	100.00 -	
	20.00	1
	100.00	

Enter sample details. Change number of specimens and test directions if required.

Click Start.

Place the specimen centrally in the jaws.

When the specimen breaks the force and extension at break are shown in green.

Press Accept.

When the results are accepted, the breaking force is displayed on the left against the specimen number.

Continue with the remaining specimens.



Specimen in the jaws ready for testing



Specimen after testing

When all the specime	ns have been tested	. click View Results	in the green bar.
Willow an and op comine		, onone them into and	in allo groon ban

l 🗖 🖆 I ₹	sults	_	Te	stWise 2013 - Test Analysis Software	_		- 0' X
Print Copy Copy Ex	xport Data		Show Data Points Offset Units	Enterning Enterning] Conf Limits] Coeff Of Var	
pecimens	~ ↓	Graph Resu	ults			= Results Settings	→ (
Warp		Warp Results				Find Force At:	0.00
1	447.15 N 445.88 N	Specimen	Max Force (N)	Extension (mm)		- Find Extension At:	0.00
3	445.88 N 449.52 N	1	447.15	13.21		-	
4	448.15 N	2	445.88	12.80		—	
5	449.33 N	3	449.52	12.89		—	
Mean	448.01 N	4	448.15	13.14		—	
Weft						-	
1	311.06 N		449.33	13.29		_	
2	296.82 N	Mean	448.01	13.07			
3	320.45 N 309.90 N	Weft Results					
5	318.82 N	Specimen	Max Force (N)	Extension (mm)		-	
Mean	311.41 N	1	311.06	12.96		-	
		2	296.82	12.46		—	
		3	320.45	13.04		—	
		4	309.90	12.65		—	
		5	318.82	12.72		-	
		Mean	311.41	12.77		•	
						Titan Data Results Se	
Standard: EN ISO 1393	34-1:2013 (200mm)	Test Name: Ex	ample Tensile Test #1			Jaw Scheme: T17 Loa	id Cell: 600 N

Switch between Results and Graph views.



To see a Print Preview, click Print.

The Print Preview will show the results and graphs as they are set up in the Results tab.

To print the document, click **Print**.



Fabric – grab test

This example is based on ASTM D5034 using the time-to-break principle. The specimen is approximately 150mm in length and a width of 100mm. An alignment mark is made on the fabric 37-38mm parallel to one of the long sides. The gauge length, or initial jaw separation is typically 75mm.



The Operator's Guide CD contains a simple movie of this test.

Search for **5034** and select the "20s" option. This options changes the speed of the test so that the specimens breaks in 20 seconds.

Select the correct Jaw Scheme, in this case T17. Ensure the 25x25mm jaw faces are in place. Pretension is not normally used in this test. Enter sample details. You can do this later if required.

Change number of specimens and test directions if required.

At least 5 specimens in the warp direction and 8 specimens in the weft (filling) direction are required. Click **Start**.

Save	1. Select Standard				2. Enter Test Details				
Save As	Refine your results			Search	Required Information	1			
Close	5034 💥				Jaw Scheme:	T17		•	0
o -	Group	Test Type	Material			Universal Pneu Top Jaw Bottom Jaw	: <u>T17</u>		
cent	Favourites	Tensile	Woven				: T17 (click to select)		
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	ASTM D5034-09 (20s) Breaking Strength and Elo	ngation of Textile Fabrics (Grab Test)			Number of 9	pecimens: 8	3		
	ASTM D5034-09 (300n Breaking Strength and Elo	nm/min) ngation of Textile Fabrics (Grab Test)			I	Directions: B	oth	•	•
					Break	Detection: 5	j		%



Specimen in the jaws ready for testing

Ensure the 25mm x 25mm jaw faces are inserted.

One only in the top grip and one only in the bottom grip.



Specimen after testing

Additional specimens may be required to establish the correct speed to achieve a fabric break in 20±3s.

In this example the first warp specimen was broken in 6s at 300mm/min. These results will be disregarded. The speed is recalculated (6/20x300=90mm/min). Press Repeat and using a new specimen carry out the test again using the new speed.



The test is repeated at the new calculated speed.



In this case the specimen has broken in 22s. If the time-to-break is within tolerance (20±3s) then press **Accept**.

If it is out of tolerance then press Repeat again.

Test the remaining warp specimens. Repeat the process for the weft (filling) specimens.



ð 🔚 🐸 I∓ File 🛛 Test estWise 2013 - Test Analysis Tun I Top Jaw Reset • Jog Up Jog Down tension % • Force N • avourites Change Logout Exit Tare Loadcell Add \$ \$≫ Exte 9 3 6) 0 Offset Show Data Points Test Completed View Results ▼ [‡] Graph Results Specia Warp 1287.61 N 2000 1 484.06 mm 1230.69 N (0) -0.16N 3 1257.32 N Mean 1258.54 N Current Task + 1500 Force - N 🚯 Ē 1000 500 25 5 10 15 20 30 35 40 45 50 Extension - % 🤨 Titan Data Results Settings Standard: ASTM D5034-09 (20s) Test Name: Grab Tensile Example #3 Jaw Scheme: T17 Load Cell: 3000 N

When all specimens have been tested, click View Results in the green bar.

Switch between Results and Graph views.

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Standard: ASTM I	D5034-09 (20s)	Test Name: Gr	ab Tensile Example #3					Ji	aw Scheme: T17	Load Cell: 3000 N



Graphs for three warp specimens with offset curves.

Yarn – Skein / Hank / Lea strength

This example is based on ASTM D1578 Option 2.

Each specimen is a hank (or skein) of 1m circumference and with 100 wraps, i.e., 100m of yarn. This means we are always attempting to break the equivalent of 200 threads simultaneously. For this reason a high capacity load cell is usually required and we recommend starting with the 5000N load cell.





Cotton hank on Skein Spools

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Enter the yarn linear density if required. Enter sample details.

Search for skein and select the required

You can do this later if required.

Change number of specimens if required. Notice this test has no direction.

Click Start.

option.

Initally the jaw seperation is a nominal 400mm.







Adjust the jaw seperation distance so that the hank can be placed on the Skein Spools by using **Jog Up** or **Jog Down** buttons.

When the jaw separetion is correct, click **Save Jaw Seperation**.

When the next specimen is to be tested Titan will move to this saved position.



As the Skein Spools are not pneumatic, the Close options are not shown.

Click **Run** or press the F9 function key to start the test.

Notice that because we entered a value for linear density, the force axis now shows cN/tex (tenacity).

If linear density was not entered, then the force units would simply display cN (in this case).

Notice **CSP** in the results screen below, the "Skein Break Factor" or "Count Strength Product" is always the result of multiplying the linear density in English Cotton Count (NeC) by the breaking force in Pounds Force (lbf) regardless of which units of linear density or force were originally used.

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Standard: ASTM D1578	8-93 (2011) - Option 2	Test Name: Skei	n Yarn Te	nsile Example #4						Jaw Scheme: T22	Load Cell: 3000 M



You can change the Extension, Force and/or Linear Density units here if required.

The changes will be reflected immediately in the results.

Fabric Tear – trouser tear test

This example is based on ISO 13937-2.

The specimens are 200mm length and 50mm width.

A mark is placed 25mm from the end to indicate the end of the tear length.

A cut of 100mm is made in the specimens.

25 ± 1	100± 1	1

If the red dashed-line in the diagram above is representative of the direction of the warp yarns then this is a warp specimen, i.e., we are tearing across the warp yarns.

During the test we will tear the fabric along the black dashed-line.

Search for **13937-2** and select the required option. Select the correct Jaw Scheme (T17). Enter sample details. You can do this later if required. Change number of specimens and test directions if required. Click **Start**.







Test Completed



Then Accept the specimen data.

To begin the next specimen click Start again.

When all the tests have been completed click **View Results**.

When only one specimen is selected, the graph shows overlays as illustrated here.

The red vertical dashed line is the first peak. The peaks between the first peak and blue vertical dashed line on the left is ignored.

The peaks between the two blue vertical dashed lines is analysed.

When the **View Result** button is clicked, all results are selected and displayed. When viewing multiple tear graphs at the same time it is difficult to distinguish the lines for each specimen even when they have different colours.

View Results



If you do not require graphs in your test report, uncheck the **Graph** option in the Include section. Alternatively, check Individual Specimen Graphs, as shown below.

To print the test report, click Print.



Fabric Tear – wing-rip tear test

This example is based on ISO 13937-3.

The specimens are 200mm length and 100mm width but have a special shape. A mark is placed 25mm from the end to indicate the end of the tear length. A cut of 100mm is made in the specimens.



The lines a-b and c-d are lined up parallel to the edge of the jaw faces. The test proceeds as per ISO 13937-2.



Fabric Tear – other tests

Other common examples of tear tests are the tongue tear (double-rip) and trapezoidal tear.

Note, if the tongue tear according to ISO 13937-4 is to be carried out then special wide jaw faces are required as shown below.



Tongue tear (or double-rip) tear specimen ISO 13937-4



Trapezoidal tear specimen EN 1875-3

Seam Slippage – fixed seam opening method



This example is based on ISO 13936-1. The specimens are 400mm length and 100mm width. Other standards may vary in respect of specimen dimensions.

Five (5) specimens in each direction are prepared.

The dashed line is an alignment mark to aid positioning the specimens correctly in the jaws.

Just before testing, the specimen is cut into two (2) parts producing a "seamed specimen" and "unseamed specimen".

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2. Enter Test Details



Search for 13936 and select the correct option.

Select the correct Jaw Scheme (T17) and fit the 25 mm x 25 mm jaw faces.

Enter sample details. You can do this later if required.

Change number of specimens and test directions if required.

Click Start.

ISO 13936-1 specifies that specimens should be subjected to 200 N.

However, some retailers and buyers have other force requirements and these have been reflected in the drop down list.

If a different force is required then enter this via the Manual button.

Because we have two specimens which react differently to the applied force, two break detection options are provided, one for the unseamed part, the second for the seamed part.







First, clamp the unseamed part of the specimen in the jaws. When clamping ensure no tension is applied to the specimen.

Click Run.

When the specified force is reached or a break is detected, the unseamed results are automatically accepted.

Clamp the seamed part of the specimen in the jaws. When clamping ensure no tension is applied to the specimen.

Click Run.

Note that the seamed part is shown by a dashed line as opposed to a solid line for the unseamed part.



When the specified force is reached or a break is detected, press **Accept**, with or without Observations.

When all the specimens have been tested, click **View Results**. Note that in the **Results Settings** it is possible to change the **Seam Opening Distance**. The default selection is 6mm.

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The notation used above, i.e., weft/warp and warp/weft, spoken as "weft over warp" and "warp over weft" can often be confusing. Here are some tips

Weft over warp slippage is defined as movement in the warp direction of the fabric, such that weft yarns move over stationary warp yarns. This means the seam is in the same direction as the weft yarns and the length of the specimen is in the warp direction.

Warp over weft slippage is defined as movement in the weft direction of the fabric, such that warp yarns move over stationary weft yarns. This means the seam is in the same direction as the warp yarns and the length of the specimen is in the weft direction.

Seam Slippage – fixed load method

This example is based on ISO 13936-2.

The specimens are 200mm length and 100mm width. Other similar standards may vary in respect of specimen dimensions. The specimens comprise of one (1) part only, the seamed specimen. Five (5) specimens in each direction are prepared. The gauge length (initial jaw separation) is 100mm.

The user manually measures and inputs the seam opening measurement values.



Search for 13936 and select the correct option.

Select the correct **Jaw Scheme** (T17) and fit the 25 mm x 25 mm jaw faces.

Enter sample details. You can do this later if required.

Change number of specimens and test directions if required.

Note there are three (3) popular force values often quoted in specifications. The chosen force depends on the end-use of the article.

Apparel ≤200 gm ⁻²	60N
Apparel >200 gm ⁻²	120N
Furnishings	180N

Other, less frequently used forces are also listed.

Click Start.

Secure the specimen in the jaws with the seam mid-way between and parallel to the edges of the jaws.

For this printed cotton satin fabric for a furnishing end-use, a force of 180N will be applied.



Current Task

Measure Seam Opening

Please measure the seam opening and record the value below. You can also enter the seam measurement later in the results view







When the force returns to 5N, you have 30 seconds to manually measure the seam opening distance and enter and save the value.

If you do not enter within this time, note the measurement so that you can enter it later.

If you need to record any of the manual seam opening measurements, then click Measure-Seam Opening



This dialogue box will be presented to you.

Enter the seam opening values if required, followed by OK.

Click View Results

View Results

8 🖬 🗢				_	TestWise 2013 - Te	st. Analysis Software			
		lesults Coport Pressure Data	Att Specimen v		Force N .	Seam Opening 🔛 Min	Aange Conficinits Aedian Coeff Of Var Sko Dev Satistics		
Spectmen	5	* 0	Graph Rese	alts -					wits Settings 🛛 👻 🖗
warp/WE	FT		warp/WEFT Re						
= 1		5.00 mm	Specimen	Hax Force (N)		Seam Openi			
2		6.00 mm	specimen 1	Max Force (N) 80,19		Seam Open	ng (mm)		
Mea		5.00 mm	2	80.19		6.00			
			3 Mean	80.10		4.00			
			Mean	80.14		5.00			
								π	tan Data Results Settings
Standard	EN ISO 139	36-2:2004	Test Name: Se	am Slippage Example #7				Ja	w Scheme: T17 Load Cell: 600 N

arp/WEFT Results						
Specimen	Max Force (N)	Seam Opening (mm)				
1	80.19	5.00				
2	80.13	6.00				
3	80.10	4.00				
Mean	80.14	5.00				



The Operator's Guide CD contains a simple movie of this test.

Stretch & Recovery – line contact

This example is based on EN 14704-1.

The specimens are approximately 300mm length and 50mm width. Other similar standards may vary in respect of specimen dimensions. Five (5) specimens in each direction are prepared. The gauge length (initial jaw separation) is 200mm.

EN 14704-1 describes two (2) methods, Method A and Method B. Method A uses Line Contact jaw faces and Method B uses Loop Bars (or C-Clamps).



The Operator's Guide CD contains a simple movie of this test.

Type **14704** in the search box and select an appropriate option. This examples uses the method described in section 9.1 including a 60 second force decay period.

Select the correct Jaw Scheme (T17) and fit the Line Contact jaw faces. Enter sample details. You can do this later if required.

Change number of specimens and test directions if required.

Click Start.

⊗I⊒ ⊘I≂ File Test	-	1000	TestWise 2013 - Test	t Analysis Soft	ware		
save	1. Select Standard				2. Enter Test Details		
📓 Save As	Refine your results		s	earch	Required Information		
🖉 Close	14704 💥				Jaw Scheme: T	17 niversal Pneumatic Jaws	. 0
Info	Group	Test Type	Material			Top Jaw: T17	
Recent	Favourites	Tensile	Woven		Во	ottom Jaw: T17	
New	Built-in Custom	Tear/Peel/Adhesion Seam	Nonwoven Coated/Laminated				
Standards		Attachment	Leather Yarn/Thread				Start
Print		Compression Stretch/Recovery	Knitted		- Optional Information		
Verification			Floorcovering Component		Batch Nbr:		
Debug			Footwear Geotextile/Related		Customer:		
Options			Composite		Quality:		
🔀 Exit	EN 14704-1 9.1 - HB Wo	ven Fabrics ty of fabrics - Part 1: Strip tests			Shade:		
	EN 14704-1 9.1 Method	A			Comments:		
	Determination of the elasticit EN 14704-1 9.1 Method	ty of fabrics - Part 1: Strip tests					
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	EN 14704-1 9.1 Method Determination of the elasticit	B (Force Decay) ty of fabrics - Part 1: Strip tests					
	FN 14704.1 9 7 - HR Kni	ttod Fabrics		-			



Above: Line Contact jaw faces Right: Specimen with Gauge Marks





If Recovered Elongation is required, measure the gauge marks at the specified periods. In this example we used 60s (1 minute). Here are all the weft results and graphs as displayed on screen with an offset. Note that it is possible to change the analysis in the Results Settings section.



Depending on the elastic characteristics of the specimen and the speed of the test, these procedures can be take a lot time relative to other types of test procedure.

Stretch & Recovery – loop bars

This example is based on EN 14704-1.

The specimens are approximately 250mm length and 75mm width. Other similar standards may vary in respect of specimen dimensions. Five (5) specimens in each direction are prepared. The gauge length (initial jaw separation) is a nominal 100mm, equivalent to the circumference of the loop specimen.

EN 14704-1 describes two (2) methods, Method A and Method B. Method A uses Line Contact jaw faces and Method B uses Loop Bars (or C-Clamps).



The Operator's Guide CD contains a simple movie of this test.

Search for 14704 and select the appropriate option. This examples uses the method described in section 9.2.

Select the correct Jaw Scheme (T18) and fit bars with a diameter between 4mm and 8mm. This example used 8mm diameter bars.

Note we have selected a force of 60N.

Enter sample details. You can do this later if required. Change number of specimens and test directions if required. Click **Start**.

🔕 i 🔜 😂 i =			TestWise 2013 -	Test Analysis Soft	tware		- 0 ×
File Test	Results		_		_		
Save	1. Select Standard				2. Enter Test Details		
🚰 Open	Refine your results			Search	law Scheme:	T18 8.0mm Bars	•
🚰 Close	14704 💥				Juw Scheme.	Loop Bars	
Info	Group	Test Type	Material			Top Jaw: <u>T18 8.0mm bar</u> Bottom Jaw: <u>T18 8.0mm bar</u>	
Recent	Favourites	Tensile	Woven		Force:	60.00	
New	Built-in Custom	Tear/Peel/Adhesion Seam	Nonwoven Coated/Laminated			45.00	
Stan dards		Attachment Compression	Leather Yarn/Thread			75.00 105.00	
Print		Stretch/Recovery	Knitted				
Options			Floorcovering Component		— Optional Informat	ion	
🔀 Exit			Footwear			Stretch Example #9	
			Geotextile/Related Composite		Customer:	Stretch Example #7	-
				_	Customer:		
	EN 14704-1 9.2 Method Determination of the elastic	d A - Fixed Elongation ity of fabrics - Part 1: Strip tests			Reference:		
	EN 14704-1 9.2 Method Determination of the elastic	d A - Fixed Load ity of fabrics - Part 1: Strip tests			Material:		
		d A - Fixed Load (Force Decay) ity of fabrics - Part 1: Strip tests			Comments:		
	EN 14704-1 9.2 Method Determination of the elastic	d B - Fixed Elongation ity of fabrics - Part 1: Strip tests		=	— Standard Customi		
	EN 14704-1 9.2 Method Determination of the elastic	d B - Fixed Load ity of fabrics - Part 1: Strip tests				Specimens: 3	•
	EN 14704.1 9 2 Methor	R . Fived Load (Force Decay)		-		Directions: Width •	•

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When all specimens have been tested click **View Results**. Here are some typical results and graphs.

Sile Tes	st Re	esults			_			TestWise 2013	- Test Analysis Software	_	_	
Print Copy Graph	Copy Results General	xport Measure Data		Selete	Reset Te:	AL-	Show Data Points	Extension % • Force N • Units	Clongation at 45.00 N Modulus at 40.00 % Un-recovered Elongation at 1 mins	Un-recovered Elongation at 60 Recovered Elongation at 1 mins Recovered Elongation at 60 min Columns	Observations	Mean Conf Limits Coeff Of Var Statistics
Specimens			-	ą	Graph	Re	sults			Ŧ	Results Settings	~ ù
Weft			198.20		Weft I	Results					+ Find Extension At	
2			193.35	_	Spec	imen	Elongation	at 45.00 N (%)	Modulus at 40.0	0 % (N)	+ Find Force At	
3			194.56		1		198.20		2.35		+ Load Decay	
Mean			195.37	%	2		193.35		2.52			
					3		194.56		2.43			
					Mea	an	195.37		2.44			
											Titan Data Results Set	tings
Standard: EN	N 14704-1	9.2 Method B	3 - Fixed Loa	d	Test N	lame: S	tretch Example	#9			Jaw Scheme: T18 8.0mm B	ars Load Cell: 120 N

We can see the graph for each specimen more clearly if we "offset" the curves.



Changing the Results Setting:

You can see that the extension is being determined at 45N. However, we applied a tension of 60N to the specimen and want to find the extension at this higher force.



Expand "Find Extension At" Force. You can see the current setting is 45 N.



Type in the new value required, in this case, 60N.

Notice that as soon as you confirm the new value by pressing the enter key, the headings and results are updated.



The Modulus is derived from the "Find Force At" Extension and a typical value is 40%. Type a new value if required and press the enter key.

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File Test Results		_	_						
Print Copy Copy Export Measure Graph Results Data -	Add Specimen*	Reset Select Show Data Test	Extension % • Force N • Units	Elongation at 60.00 N Modulus at 40.00 % Un-recovered Elongation at 1 mins	Recovered Elo	ongation at 60 mins] Force Decay (Exercising)] Observations	Mean Conf Limits Coeff Of Var Statistics	
Specimens 🝷 🎚	Graph Resu	lts			-	Results Settings			- ₽
Weft 1 211.28 %	Weft Results					+ Find Extension	At		
2 206.24 %	Specimen	Elongation at 60.00 N (%)		Modulus at 40.00 % (N)		- Find Force At			
3 206.89 %	1	211.28		2.35		Extension:	40.00	%	
Mean 208.14 %	2	206.24		2.52		Cycle:	5 • Loi		
	3	206.89		2.43					
	Mean	208.14		2.44		+ Load Decay			
	Conf Limits	±6.82		±0.20					
	Coeff Of Var	1.32%		3.34%					
						Titan Data Res	sults Settings		
Standard: EN 14704-1 9.2 Method B	B - Fixed Load	Test Name: Stretch Example	#9				Jaw Scheme: T18-	-8 Load Cell:	120 N



Specimen before testing on Loop Bars



Specimen at maximum specified load

Button Strength

The example is based on BS 4162, but instead of using a welding rod to break the button it uses a strong braided cord. It is the force required to pull a loop of braided cord which has been threaded through two (2) adjacent holes and break the button.

The tooling used is a combination of T17 (to hold the braided cord) and the T4 Button Holder to hold the button.

When using the T4 Button Holder, the button is fully enclosed so that if the button should shatter when broken all of the fragments will be retained.



The Operator's Guide CD contains a simple movie of this test.



 Search for **button** and select the appropriate option.

This examples uses the method described by a popular UK Retailer.

Select the correct Jaw Scheme (T4).

Enter sample details. You can do this later if required.

Change number of specimens if required.

Click Start.

The test will begin with a nominal jaw separation of 100 mm but this can be adjusted to suit individual specimen needs.

Click Save Jaw Separation when a suitable gauge length is obtained.



Button before testing with braided cord attached



Button is broken and fragments remain inside T4



Button in T4 and braided cord secured by T17



Button fragments removed from T4

These are the results as seen on screen.

The four buttons used were all different, hence the variation in results.



Security of Attachments

The example is based on EN 71-1. It a tension test with three (3) force options: 50, 60 or 90N. This standard was originally designed for the testing of children's toys but has been adopted for other uses mainly due to lack of alternative standards (although this is slowly changing).



The Operator's Guide CD contains a simple movie of this test.

E tave AL	1. Select Standard				2. Enter Test Details			
Copen	Refine your results			Search	Required informatio	n (
5 One	EN 30 71-1 30				Jaw Scheme	T12 Attactorety ND		
f9 :	Group	Test Type	Material			Top Jaks T12ah Botton Jaks T12ah		
cent	Favourites	Terrille	Waveen.		Sheart	100.00	Menual	mm/min
*	Bullt-In Custom	Tear/Peel/Adhedian Seam	Nonwoven Coated/Laninated		Force		Manual	
andards		Attuchment	Leather Yam/Thread			56.00	 California Con	
15		Stretch/Recovery	Koltled			90.00		
nitcation:			Floarcovering Component					Start
ing .			Footwear Geotextile/Related		- Optional Informat	201		
Options			Compodite					
EXR	EN 71-1 (Compression	Test: 110N)		10	Batch Nbrt	Attachments		
	Safety of tays - Part 1; Pe	chanical and physical properties			Customer:			
	EN 71-1 (Seam Test) Safety of tass - Part Line	shanical and physical properties		0	Quality			
	EN 71-1 (Tension Tes	there are physical properties.		10	Shade:			
	and a site ration	Concernent in Local Solitorian			Comments:			

Type **71-1** in the search box. Select the correct Jaw Scheme (T12).

Choice the appropriate force. The choice of speed is dependent on the product under test. EN 71-1 states the force should be applied within 5s, so the speed may need adjusting accordingly.

Click Start.







The initial jaw separation is 100m.

Move the grip to the correct position to hold the attachment and then click **Save Jaw Separation**.

Note that the chosen tooling may vary from that illustrated (three pronged grip) as the tooling is chosen to best grip the attachment. Here are the results as seen on screen, also showing an observation made on specimen number 4.



Ball Burst

This is a multi-axial compression test in which a ball is pushed through the specimen and the force required recorded.

This type of bursting test is not as popular as the test carried out on pneumatic or hydraulic bursting strength testers and the results obtained from the ball burst test are not comparable with those from the inflated diaphragm methods.

This example uses ASTM D6797. The test has no direction.



The Operator's Guide CD contains a simple movie of this test.



Type 6797 in the search box. Select the required Jaw Scheme (T20A). Select the required pretension.

Enter sample details. You can do this later if required.

Change number of specimens if required.

Click Start.

strength test.

When a compression Jaw Scheme is about to be used, the user is prompted to Acknowledge this.

Check that T20A is physically connected to Titan.



T20A setup ready for testing

Here are the test results as shown on screen.



Titan⁵ and TestWise Operator's Guide



This test is very similar to a basic tensile



Specimen after bursting by the ball

⊗	TestWise 2013 - Test Analysis Software	
Print Copy Copy Graph Results Dat General	Add Delete Reset Select Show Data Offset	
Specimens 1 424.32 2 443.33 3 464.13	Results	Results Settings 🛛 🔻 A
Mean 443.93		
Standard: ASTM D6797-0	Test Name: Ball Burst	Titan Data Results Settings Jaw Scheme: T20A Load Cell: 600 N



SAFETY

General

Titan has been specifically designed with the Operator's health and safety in mind. This ensures the minimum Operator stress and fatigue. Titan is virtually silent in operation to suit the laboratory environment.

Please observe the following points at all times:

- Take extreme care when moving the machine. Never attempt to manoeuvre Titan without the appropriate lifting gear. Without jaws, Titan weighs approximately 85kg.
- Always remove both hands from the specimen area before starting a test.
- Take care when changing grips and load cell assemblies. Ensure they are always firmly and securely attached to the machine.
- Never place any obstruction in the path of the carriage.
- Always ensure the jaw faces are correctly seated.
- Always ensure pneumatic connections are secure when changing jaws.
- Some materials when tested to rupture can leave the test area either by a whipping action or as fragments. A risk assessment should be made for these types of uncommon materials.

Emergency Stop Button

Familiarise yourself with the location of the large red Emergency Stop Button at bottom left of the instrument. Use this button only in case of emergency to completely stop Titan.

Impact Protection

When the load on an obstruction, such as a hand, equals the weight of the jaw the drive will stop, this will prevent any serious injury. The Operator should, however, always be vigilant and never obstruct the motion of the jaw. If in doubt hit the Emergency Stop Button.

Soft Closing Jaws

Full jaw pressure is automatically applied when the Operator presses the **Start** button. *When loading a sample, only a low pressure is applied*, this will help prevent serious injury. The Operator should, however, always be vigilant and never place fingers between the jaw faces. If in doubt hit the Emergency Stop Button.

UNPACKING

Titan⁴ is attached to a wooden pallet and metal transport frame. These must be removed before use.



Read all of these instructions before beginning to un-pack the instrument.

Before un-packing, transport the box to the room where the instrument is to be located.

Remove the outer top cover to reveal the Accessories Tray.

Remove any additional internal packaging.

Then carefully remove the outer cardboard packaging to reveal the Yellow Transport Frame.



Before moving the instrument, remove the bolts (tools provided) which secure the Yellow Transport Frame to the wood pallet.

With the instrument still lying on its back, lift into the upright position. The 'curved heel' on the bottom lifting frame is designed to ease this lifting procedure.



Once raised into the upright position, the bottom Yellow Transport Frame can be removed from the base by unbolting the front cross member (unscrew the bolts on the left and right as indicated by the red circle).

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Then unbolt the remaining left and right sides of the bottom frame from the base of the instrument.



The top Yellow Transport Frame can now be removed from the instrument.

INSTALLATION

Installation Requirements

Desk depth750 mm recommended, 600 mm absolute minimum.Desk length1500 mm to allow for Titan, PC (laptop or desktop style), monitor and printer.



Electrical supply

Machine single phase 110 - 230Va.c. +/-10% at 10A maximum, 50/60Hz, 500W. Provision must also be made for the PC, monitor and optional printer.

Compressed Air supply



It is recommended the air supply has a minimum Free Air Delivery (FAD) of 11 litres per minute at 8 bar (116psi) and must be filtered to 5 microns (absolute) or better to remove excess particulates, oil and moisture. Minimum air supply 7 bar.

Note: Titan is fitted with onboard filtering. However, a contaminated air supply (not filtered) will result in early blockage of the onboard filter element.

For laboratories without a dedicated compressed air supply, we can offer the choice of a 110V (60Hz) or 230V (50Hz) silent laboratory compressor.

Environment

As with all physical testing, tests should be carried out in a standard atmosphere for testing textiles, i.e., 20°C and 65% RH. However, the instrument will operate satisfactorily providing temperature and humidity levels are relatively stable. The humidity conditions must be non-condensing. The surrounding area should be electrically and magnetically stable.

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Titan⁵ and TestWise Operator's Guide

TECHNICAL SPECIFICATION

Measuring Principle	Constant Rate of Extension (CRE)
Capacity (Tension & Compression)	5000N, 5kN, 500kgf and 1100lbf
Load Cells	5000N, 1000N, 500N, 200N, 100N Quick-change cartridge, auto-recognition "S" beam cells
Test / Return / Jog Speed	1 - 2000mm/min
Accuracy of Load Cells Class	0.5 (±0.5%) from 2 - 100% of load cell capacity
Speed Accuracy	± 0.005%
Maximum Stroke	560mm with T27 grips fitted
Total Vertical Space	700mm with no grips fitted
Positional Accuracy	± 0.00125mm
Calibration	Load cells: ISO 7500-1 (UKAS accredited) and ASTM E4 Instrument: ISO 7500-1 and ASTM D76
Safety	CE marked (complies with Machinery, Low Voltage and EMC Directives)
Warranty	18 months