

# Mecmesin

testing to perfection

# Digital Force & Torque Gauges



Tension and Compression  
Test Solutions



# Advanced Force Gauge

The Advanced Force Gauge (AFG) is the most versatile and fully-featured instrument available on the market. Housed in an ergonomically shaped rugged aluminium case, the AFG is powered by either mains-adaptor or standard rechargeable AAA batteries. It can be used hand-held or fixed to a manual or motorised test stand to enable tension and compression testing under controlled conditions.

## KEY FEATURES:

- 10 capacities - from 2.5N to 2500N
- Peak capture - Ultimate max + 1st peak
- Data output - RS232, digimatic and analogue
- Pass/Fail Alarms - audible and visual
- Overload warning with trend bar
- Wide range of grips and fixtures

versatile  
rugged  
accurate



AFG shown mounted to the MultiTest-d motorised test stand

RS232, Mitutoyo, Analogue data output for easy data transmission

Recognises data from a range of external force & torque transducers, e.g. S-Beam, Load Button Cell and Static Torque Wrench.

View the 1st peak and ultimate peak readings. On-board memory stores up to 500 readings

Accurate to  $\pm 0.1\%$  full-scale

Internal loadcell stud for quick and easy change of accessories and fixtures  
Loadcell stud 10-32 UNF male  
(5/16 UNC male for AFG 1000N & 2500N)



# AFG Specification Table

Model	Part No.	mN	N	kN	gf	kgf	ozf	lbf
AFG 2.5	850- 412	2,500 x 0.5	2.5 x 0.0005	-	250 x 0.05	-	9 x 0.002	0.55 x 0.0001
AFG 5	850- 413	5,000 x 1	5 x 0.001	-	500 x 0.1	0.5 x 0.0001	18 x 0.005	1.1 x 0.0002
AFG 10	850- 414	10,000 x 2	10 x 0.002	-	1,000 x 0.2	1 x 0.0002	35 x 0.01	2.2 x 0.0005
AFG 25	850- 415	25,000 x 5	25 x 0.005	-	2,500 x 0.5	2.5 x 0.0005	90 x 0.02	5.5 x 0.001
AFG 50	850- 416	50,000 x 10	50 x 0.01	-	5,000 x 1	5 x 0.001	180 x 0.05	11 x 0.002
AFG 100	850- 417	-	100 x 0.02	-	10,000 x 2	10 x 0.002	350 x 0.1	22 x 0.005
AFG 250	850- 418	-	250 x 0.05	-	25,000 x 5	25 x 0.005	900 x 0.2	55 x 0.01
AFG 500	850- 419	-	500 x 0.1	-	50,000 x 10	50 x 0.01	1,800 x 0.5	110 x 0.02
AFG 1000	850- 420	-	1,000 x 0.2	1 x 0.0002	-	100 x 0.02	3,500 x 1	220 x 0.05
AFG 2500	850- 421	-	2,500 x 0.5	2.5 x 0.0005	-	250 x 0.05	9,000 x 2	550 x 0.1

- Accuracy  $\pm 0.1\%$  of full scale
- Full scale deflection of loadcell typically 0.5mm

## Audible & visual pass/fail alarms

Set a threshold for immediate alert when limits are exceeded

Measurements made in N, kN, mN, lbf, ozf, kgf and gf with a sampling rate of 5000Hz

## Reversible display

View readings even when the gauge is positioned away from you

## Rugged metal housing

Ideal for factory or outdoor use

For added flexibility the AFG is able to recognise data from a range of external 'Smart' force and torque transducers, so you can use it as a universal display for remote applications, (see pages 5 to 8).

The dual level design of the keypad ensures that operation of this powerful gauge is kept simple, thereby making it ideal for use from production shop floor to R&D.

All models carry CE marking and are supplied in a robust carrying case with standard accessories and a calibration certificate traceable to UK national standards.



Textile tension test



AFG and accessories



# AFTI The Advanced Force

The AFTI is a high-specification display unit with similar features and benefits of the AFG, for use with Mecmesin 'Smart' force and torque sensors. These plug into the AFTI enabling it to automatically register either force or torque readings for a variety of test applications. 'Smart' sensors may also be used with Mecmesin's Advanced Force Gauge (AFG).

## FORCE



## TORQUE



Fully interchangeable 'smart' transducers

No need for additional calibration of display or transducer, just 'plug & play'

Tension, compression & torque measurement with full unit conversion of displayed value

1st & ultimate peak capture

These sensors are ideal for mounting onto your own test rigs and jigs to monitor load application. They can also be used for checking calibration of your machinery to assess whether it is applying the expected load.

# & Torque Indicator

## 'Smart' Force & Torque Transducers

All transducers are fitted with 1.5m cable length, are fully interchangeable and are supplied with Calibration Certificates traceable to UK National Standards. As standard they are delivered in cardboard transit cases.

All dimensions quoted for the force & torque transducers are for reference only. Please contact the Mecmesin Sales Department for tolerance information if your application is dimensionally critical.

RS232, Mitutoyo, Analogue data output for easy data transmission

Measurements made in N, lbf, kgf, kN, N.m, kgf.cm, lbf.in, gf.cm and ozf.in with a sampling rate of 5000Hz

Overload warning with trend bar and on board memory of 500 readings

force. & torque  
plug-in sensors  
adaptable

Overload protection by software warning is typically 120% of full scale for all items (without accessories), with additional mechanical overload protection being up to a minimum of 150% of full scale.

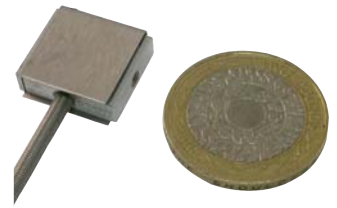
All gauges and sensors are calibrated under controlled laboratory conditions at a temperature of  $20^{\circ}\text{C} \pm 2^{\circ}\text{C}$ . Resolution for all sensors is typically 1.5000 - e.g. a 5000N loadcell resolves to 1N.



# Tension & Compression

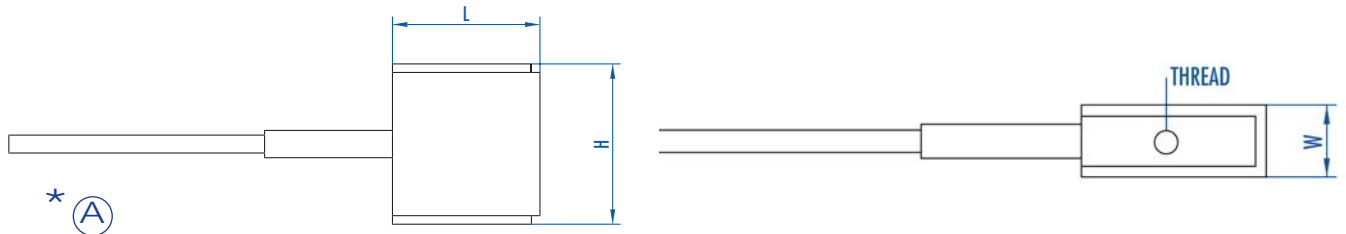
## Junior S-Beam - 'Smart'

The Junior S-Beam is suitable for measuring tension and compression. Ideal for applications where available space is limited. Dedicated fixtures can be fitted via threaded holes.



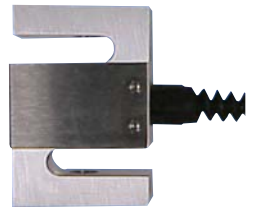
Model	Part No.	L mm	W mm	H mm	Thread
1N/100gf/3.5ozf	870 - 101	17	7	19	M3 x 0.5
2.5N/250gf/9ozf	870 - 102	17	7	19	M3 x 0.5
5N/500gf/18ozf	870 - 103	17	7	19	M3 x 0.5
10N/1kgf/2.2lbf	870 - 104	17	7	19	M3 x 0.5
25N/2.5kgf/5.5lbf	870 - 105	17	7	19	M3 x 0.5
50N/5kgf/11lbf	870 - 106	17	7	19	M3 x 0.5
100N/10kgf/22lbf	870 - 107	17	7	19	M3 x 0.5
250N/25kgf/55lbf	870 - 108	17	7	19	M3 x 0.5
500N/50kgf/110lbf	870 - 109	17	7	19	M3 x 0.5

Accuracy  $\pm 0.25\%$  of full scale



## S-Beam - 'Smart'

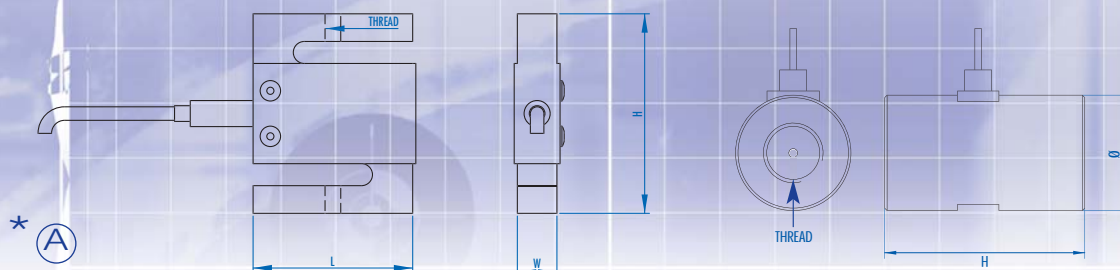
The S-Beam provides an economical solution to general force measurement applications where space is not restricted. Dedicated fixtures can be fitted via threaded holes.



Model	Part No.	L mm	W mm	H mm	Thread
100N/10kgf/22lbf	870 - 002	51	13	64	1/4 - 28 UNF
200N/20kgf/44lbf	870 - 004	51	13	64	1/4 - 28 UNF
500N/50kgf/110lbf	870 - 009	51	19	76	1/4 - 28 UNF
1000N/100kgf/220lbf	870 - 001	51	19	76	1/4 - 28 UNF
2500N/250kgf/550lbf	870 - 006	51	25	76	1/2 - 20 UNF
5000N/500kgf/1100lbf	870 - 008	51	25	76	1/2 - 20 UNF
10kN/1000kgf/2200lbf	870 - 003	51	25	76	1/2 - 20 UNF
25kN/2500kgf/5500lbf	870 - 007	76	25	108	3/4 - 16 UNF

Cylindrical	Part No.	$\phi$ mm	H mm	Thread
* 50kN/5000kgf/11000lbf	870 - 011	70	120	M36 x 3
* 100kN/10000kgf/22000lbf	870 - 010	70	120	M36 x 3

Accuracy  $\pm 0.25\%$  of full scale \* Uni-directional calibration (please specify tension or compression)



\* For use with AFTI display or Advanced Force Gauge (AFG)

## Load Button Cell - 'Smart'

The Load Button Cell is a miniature sensor for compression measurement only, where available space is very limited. For optimum results apply compressive load to the top of the sensor's central dome.



### MINIATURE SERIES

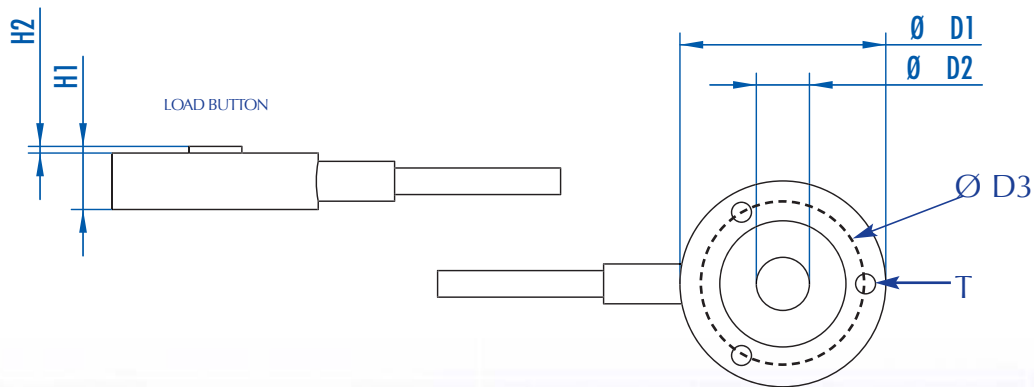
Model	Part No.	Capacity	ØD1mm	ØD2mm	ØD3mm	H1mm	H2mm	T
L16010	878 - 008	100N/10kgf/22lbf	25	5	19	8	1	4/40UNC
	878 - 009	250N/25kgf/55lbf	25	5	19	8	1	4/40UNC
	878 - 010	500N/50kgf/110lbf	25	5	19	8	1	4/40UNC
L16020	878 - 011	1000N/100kgf/220lbf	31	8	25	10	1	6/32UNC
	878 - 012	2500N/250kgf/550lbf	31	8	25	10	1	6/32UNC
	878 - 013	5000N/500kgf/1100lbf	31	8	25	10	1	6/32UNC
L16030	878 - 014	10kN/1000kgf/2200lbf	38	11	32	16	2	6/32UNC
	878 - 015	20kN/2000kgf/5500lbf	38	11	32	16	2	6/32UNC
	878 - 016	50kN/5000kgf/11000lbf	38	11	32	16	2	6/32UNC

Accuracy ±1% of full scale

### SUB-MINIATURE SERIES

Model	Part No.	Capacity	ØD1mm	ØD2mm	H1mm	H2mm
L1630	878 - 001	50N/5kgf/11lbf	19	4.5	7	0.5
	878 - 002	100N/10kgf/22lbf	19	4.5	7	0.5
	878 - 003	250N/25kgf/55lbf	19	4.5	7	0.5
	878 - 004	500N/50kgf/110lbf	19	4.5	7	0.5
	878 - 005	1000N/100kgf/220lbf	19	4.5	7	0.5
	878 - 006	5000N/500kgf/1100lbf	19	4.5	7	0.5

Accuracy ±1% of full scale



\* (A)

(A)

## Specialised Loadcells

In addition to the standard range of sensors, Mecmesin also offers specialised loadcells dedicated to specific applications. A few examples are shown below.

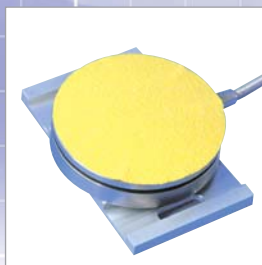
Contact our sales department for further details.



Pinch Sensor



Donut Loadcell



Pedal Force Accelerator



Hand Gripper

6



# Static & Rotary Torque

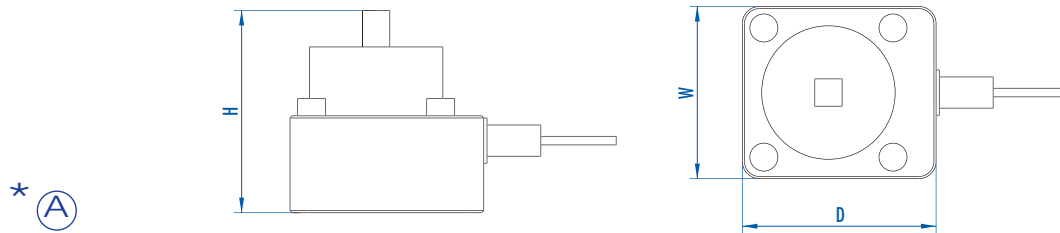
## Static Torque Transducer - 'Smart'

For mounting to a bench or integrating into a complete test rig. Equipped with male square drive for easy fitting of adaptors.



Model	Part No.	Capacity	Sq Drive Male	H mm	W mm	D mm
ST15	872 - 006	15N.m/150kgf.cm/130lbf.in	3/8"	87	80	90
ST60	872 - 008	60N.m/600kgf.cm/520lbf.in	3/8"	87	80	90
ST100	872 - 003	100N.m/1000kgf.cm/870lbf.in	1/2"	93	80	90
ST150	872 - 005	150N.m/1500kgf.cm/1300lbf.in	1/2"	93	80	90

Accuracy  $\pm 0.5\%$  of full scale



\* (A)

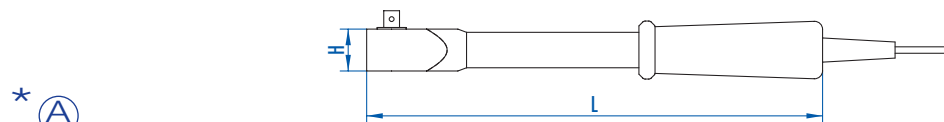
## Static Torque Wrench - 'Smart'

For medium capacity applications where it is more practical to apply torque by a lever arm. Equipped with male square drive for easy fitting of adaptors.



Model	Part No.	Capacity	Sq Drive Male	L mm	H mm	Weight
TW15	873 - 003	15N.m/150kgf.cm/130lbf.in	3/8"	280	25	800g
TW60	873 - 005	60N.m/600kgf.cm/520lbf.in	3/8"	355	25	950g
TW150	873 - 006	150N.m/1500kgf.cm/1300lbf.in	1/2"	508	25	1200g

Accuracy  $\pm 0.5\%$  of full scale



\* (A)

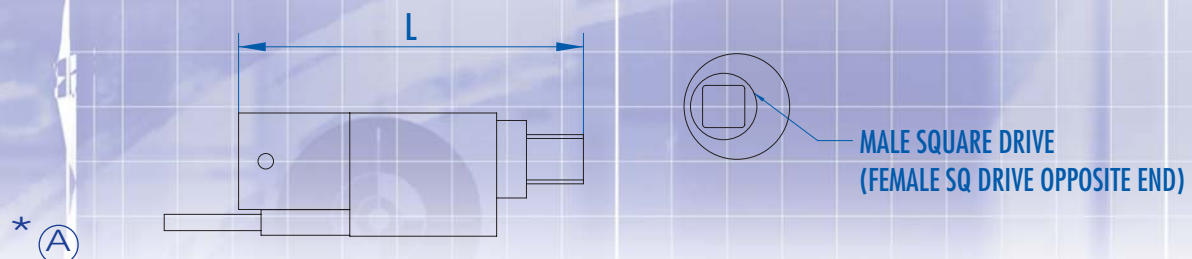
## Static Socket Extension - 'Smart'

For low capacity applications, where space is limited. Fitted with male/female square drives for easy fitting of drivers.



Model	Part No.	Capacity	Sq Drive	L mm
SE3	871 - 201	3N.m/30kgf.cm/26lbf.in	1/4"	50.8
SE6	871 - 202	6N.m/60kgf.cm/50lbf.in	1/4"	50.8
SE10	871 - 203	10N.m/100kgf.cm/90lbf.in	1/4"	50.8

Accuracy  $\pm 0.5\%$  of full scale



\* (A)



\* For use with AFTI display or Advanced Force Gauge (AFG)

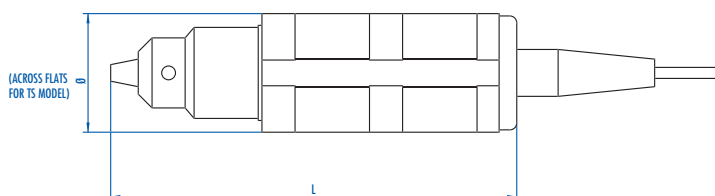
## Static Torque Screwdriver - 'Smart'

For low capacity applications. Used as hand-held devices or mounted in a bench stand (type TS only). Not suitable for applications which require multiple rotations of the sensor - use rotary torque transducers below.



Model	Part No.	Capacity	Drive	L mm	Ø mm	Weight
H1	871 - 100	10mN.m/100gf.cm/1.4ozf.in	3h7* push-fit female	115	16	130g
H5	871 - 101	50mN.m/500gf.cm/8ozf.in	3h7* push-fit female	115	16	130g
H10	871 - 102	100mN.m/1000gf.cm/15ozf.in	3h7* push-fit female	115	16	130g
H50	871 - 103	500mN.m/5kgf.cm/5lbf.in	1/4"*** hex female	124	22	280g
H100	871 - 104	1N.m/10kgf.cm/9lbf.in	1/4"*** hex female	124	22	280g
TS1.5	871 - 002	1.5N.m/15kgf.cm/13lbf.in	3/8" sq male/3 jaw chuck	143	43	660g
TS3	871 - 003	3N.m/30kgf.cm/26lbf.in	3/8" sq male/3 jaw chuck	143	43	660g
TS6	871 - 005	6N.m/60kgf.cm/53lbf.in	3/8" sq male/3 jaw chuck	143	43	660g
TS10	871 - 001	10N.m/100kgf.cm/90lbf.in	3/8" sq male/3 jaw chuck	143	43	660g

\*with clamping screw \*\* with hold spring Accuracy ±0.5% of full scale



\* (A)

## Rotary Torque Transducers - 'Smart'

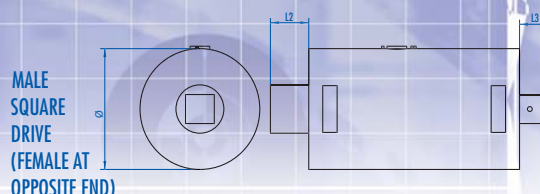
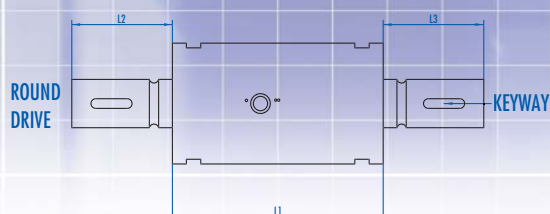
A complete range of sensors for measuring rotary torque. Suitable for dynamic torque applications with multiple revolutions (e.g. window-winder torque tools)



Model	Part No.	Capacity	Drive	L1 mm	L2 mm	L3 mm	H mm	W mm	Max rpm
RM 50	877 - 010	50mN.m/500gf.cm/8ozf.in	Ø 9mm round	51	19	28	46	20	5000
RM 500	877 - 011	500mN.m/5000gf.cm/5lbf.in	1/4" hex female	51	19	28	46	20	1000
RN1	877 - 012	1N.m/10kgf.cm/9lbf.in	1/4" hex female	51	19	28	46	20	1000

Model	Part No.	Capacity	Drive	L1 mm	L2 mm	L3 mm	Ø mm	Max rpm
FAST 2N.m sq	877 - 020	2N.m/20kgf.cm/18lbf.in	1/4" square	70	16	10	40	1000
FAST 2N.m rd	877 - 021	2N.m/20kgf.cm/18lbf.in	Ø 9mm round*	70	28	28	40	5000
FAST 6N.m sq	877 - 022	6N.m/60kgf.cm/53lbf.in	1/4" square	70	16	10	40	1000
FAST 6N.m rd	877 - 023	6N.m/60kgf.cm/53lbf.in	Ø 9mm round*	70	28	28	40	5000
FAST 15N.m sq	877 - 024	15N.m/150kgf.cm/133lbf.in	1/4" square	70	16	10	40	1000
FAST 15N.m rd	877 - 025	15N.m/150kgf.cm/133lbf.in	Ø 9mm round*	70	28	28	40	5000
FAST 60N.m sq	877 - 026	60N.m/600kgf.cm/530lbf.in	3/8" square*	70	24	13	50	1000
FAST 60N.m rd	877 - 027	60N.m/600kgf.cm/530lbf.in	Ø 14mm round*	70	28	28	50	5000
FAST 150N.m sq	877 - 028	150N.m/15.3kgf.m/111lbf.ft	1/2" square	70	35	19	50	1000
FAST 150N.m rd	877 - 029	150N.m/15.3kgf.m/111lbf.ft	Ø 19mm round*	70	55	55	50	5000

Accuracy ±1% of full scale \* fitted with keyway



Note: Model RM/RN is rectangular in shape (see table above)

\* (A)

# Basic Force Gauge

The Basic Force Gauge (BFG) is designed for easy operation and provides outstanding tension and compression measurement performance and reliability at an affordable price.

easy-to-use  
robust  
ergonomic

Constructed in a rigid yet lightweight aluminium housing, with its ergonomically attractive shape, the BFG can be used as a hand-held instrument, or alternatively it can be mounted to manual or motorised test stands to allow testing under more controlled conditions.



BFG shown mounted to the MDD manual test stand



Captures peak readings in tension or compression

Rugged metal housing  
Ideal for factory or outdoor use

Internal loadcell stud for quick and easy change of accessories and fixtures  
Loadcell stud 10-32 UNF male (5/16 UNC male BFG 1000N & 2500N)



# Compact Force Gauge

The Compact Force Gauge (CFG) is a pocket-sized, lightweight force gauge designed for elementary tension and compression measurement. Powered by disposable AA batteries, the CFG is delivered with a Declaration of Conformity as standard. A Calibration Certificate is available upon request.

low cost  
peak hold  
portable



Peak readings captured at 10Hz with an accuracy of  $\pm 0.5\%$  of full scale

Measurements made in N, lbf, ozf, kgf and gf with a resolution of 1:1000

Housed in a lightweight plastic case

Loadcell stud 10-32 UNF male

The CFG provides a simple digital alternative to traditional analogue spring balances. It is ideal for users with a limited budget, who only measure on an occasional basis for non-critical applications.

## CFG Specification Table

Model No.	Part No.	N	kgf	lbf
CFG 50	860 - 002	50 x 0.05	5 x 0.005	11 x 0.01
CFG 200	860 - 001	200 x 0.2	20 x 0.02	44 x 0.05
CFG 500	860 - 003	500 x 0.5	50 x 0.05	110 x 0.1

- Accuracy  $\pm 0.5\%$  of full scale

**Note.** The following units are available on the majority of CFG models. Those that differ are marked by an asterisk with details given below,

kN\*, N, mN, kgf, gF\*\*, lbf, ozF

\* Not available on the CFG 50N

\*\*Not available on the CFG 200N or 500N



Testing fire extinguisher



# Accessories

Each Mecmesin gauge comes with a set of standard accessories to help perform basic tension or compression tests.

A wide selection of accessories exclusive to Mecmesin are available. See our Accessory datasheets for an extensive range of grips and fixtures, to enable you to complete thousands of different tests. Alternatively make use of our experienced team of engineers to provide a customised grip to solve your particular problem.



- A 6mm  $\varnothing$  - 5/16 UNC thread (432-122)
- B 6mm  $\varnothing$  - 10-32 UNF (F) (432-120)
- C 3.2mm  $\varnothing$  - 10-32 UNF (F) (432-118)
- D 19mm  $\varnothing$  - 10-32 UNF (F) (432-121)
- E 19mm  $\varnothing$  - 5/16 UNC (F) (432-125)

- F 30mm long - 5/16 UNC (F-M) (432-008)
- G 30mm - 10-32 UNF (F) to 10-32 UNF (M) (432-006)
- H 30mm - 10-32 UNF (F) to M6 (M) (432-007)
- I Mains adaptor/charger (304-004) - 220V 2-pin round (304-005) - 220V 3-pin square (304-006) - 110V 2-pin flat

*\* Part numbers shown in brackets*

Table of standard accessories delivered with each gauge:

Model	A	B	C	D	E	F	G	H	I
AFG 2.5, 5, 10, 25, 50, 100, 250N			•	•			•	•	•
AFG 500N		•		•			•	•	•
AFG 1000 & 2500N	•				•	•			•
BFG 10, 50, 200N			•	•			•	•	•
BFG 500N		•		•			•	•	•
BFG 1000 & 2500N	•				•	•			•
CFG 50N			•	•			•	•	
CFG 200N			•	•			•	•	
CFG 500N		•		•			•	•	

## Service Repair and Calibration

Mecmesin ensures all customers receive a high level of on-going service and support. This includes offering a prompt and cost-effective calibration and repair service. Though calibrations can be completed in our comprehensive in-house facility, customers also have the option of allowing one of our qualified engineers to undertake the calibration on-site.

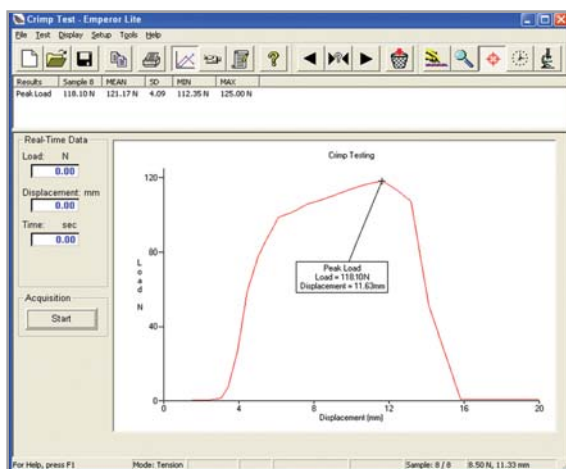


# Additional Products

To enhance your testing capability, Mecmesin offers a number of additional products including;

## Emperor Lite

Emperor Lite is Mecmesin's powerful data-acquisition software, for use with its extensive range of force & torque measurement equipment. The software quickly and easily enables operators to perform in-depth analysis of measurements using a graphical trace of the test. User-selectable calculations provide instant results for key test parameters, allowing you to gain valuable quantitative information about the test samples.



Graphical representation of a crimp test

- View test 'live' on PC screen
- Perform multiple calculations e.g. peak, minimum and average
- Easily identify and label critical measurement values and success/failure points during the test
- Summary test report with graphical traces

## Grips

Mecmesin offers a wide range of grips and fixtures, to suit many types of application. For those with a specialised requirement, we can design and manufacture a customised fixture to match your specifications.



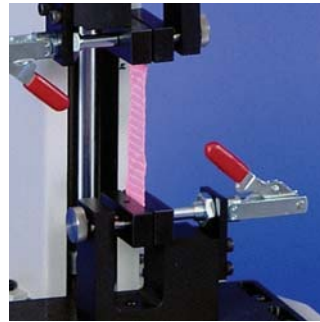
- Compression plates
- Test hooks
- Textile attachment grips
- Claw type grips
- Compression probes
- Wedge grips
- Flat-faced jaw grips
- Cam grips



# Applications

Our range of digital gauges can be used in combination with our test stands to perform many different applications,

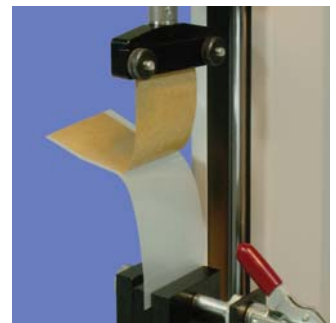
- Release-torque testing
- Compressive testing
- Deformation testing
- Medical Device testing
- Packaging testing
- Tensile testing
- Textile testing
- Top-load testing



Fabric testing



Keypad testing

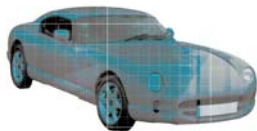


Peel testing

Mecmesin's range of testing equipment has been successfully used in a number of different industry sectors including,



aerospace



automotive



electrical



medical



packaging



pharmaceutical



plastics



safety



textiles

## Support Services

- Comprehensive network of international distributors
- 24 month warranty
- Website support
- Calibration, service & repair centre
- On-site installation and training
- Accessories
- Application support



# Mecmesin

testing to perfection

## Over 30 Years Experience in Force & Torque Technology

Formed in 1977, Mecmesin Limited is today widely regarded as a leader in force and torque technology for quality control testing in design and production. The Mecmesin brand stands for excellent levels of performance and reliability, guaranteeing high quality results. Quality control managers, designers and engineers working on production lines and in research laboratories worldwide rely upon Mecmesin force & torque measurement systems for a range of quality control testing applications, which is almost limitless.

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