Chatillon
force measurement
AMETEK

DFS3 Series
Digital Force Gauge

From 0.5 lbf to 500 lbf
2.5 N to 2500 N

Functions and Features

The **DFS3 Series** offers the best price performance of any digital force gauge available today. This compact, easy-to-use force gauge is designed for basic and complex applications. Ideal for handheld or test stand applications, the **DFS3** may be equipped with integral loadcells or smart remote sensors for load measurement or torque measurement.

Measurement accuracy is better than 0.1% full scale in integral load cell models. A large, easy-to-read, high resolution, full-color LCD display supports a variety of standard gauge functions including normal and peak readings, high/low limits, setpoints, pass/fail results, statistical results, load averaging, % and sharp break detection, loadcell actuation, and direction. Loads are displayed in ozf, gf, lbf, kgf and N units. The display can be inverted, and displayed results may be "hidden" from the operator. The **DFS3** also offers password protection for gauge test methods.

Comprehensive Results

The **DFS3** Series supplies you with comprehensive results that are easy to view and understand. The gauge displays:

- Measured result with Units:
  - Peak Tension and Compression
  - Break Tension and Compression
  - Load Average/Time
- Operating Mode
- Pass-Fail Result
- High and Low Load Results
- Saved Results
- Statistical Calculations:
  - Average with MIN and MAX Results
  - Coefficient of variance
  - Standard Deviation
  - Graphical representation of saved results

The modern, ergonomic and comfortable design provides great pleasure to use the **DFS3**.

Communication

The **DFS3** series comes as standard with a USB-C connection used for communication and charging with supplied cable and connection to PC with **ForceTest software**.

Integrate your gauge with other systems using the ASCII communication protocol. Use the dedicated and selectable ASCII Mode to connect to external application/ software to export results and statistics automatically (If set in gauge).

Automate Actions

The **DFS3** has 5 "Test Setups" to define your test protocol. You will be able to optimize use, gain efficiency, and standardize.
The test setup can be defined with the unit of measure, safety limits, test results, pass/fail tolerances, backup, and automatic or manual export. Save your preferred display configuration.
DFS3 is optimized to help you save time, and perform with operational ease.

Force testing

To benefit from a more stable and reliable test speed, the **DFS3** can be combined with a **TCM** Motorized Test Stand. This helps to eliminate any variables that might impact the force readings and offers an ideal solution for repeatable force measurement testing.

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Functions and Features

Unique User Interface

Easy to use, single-layer user interface. No deep menu structure! Operate and set up the **DFS3** to perform your tasks. Fast and intuitive!

The high-resolution display features brightness adjustments and can be inverted when required. A load bar graph indicating load direction, measured load, and safe load helps prevent overloads: the load bar changes from green to red to indicate proximity to load cell capacity. The integral loadcells feature mechanical overload protection at 150% Full Scale.

Dependable Measurements

The **DFS3** Series features an integral loadcell sensor that delivers repeatable, accurate results. The innovative load bar graph shows dynamic load, direction of load, and warns you of pending overload conditions. Smart technology in the gauge even keeps track of overload history to aid in maintenance and troubleshooting.

Always up to speed

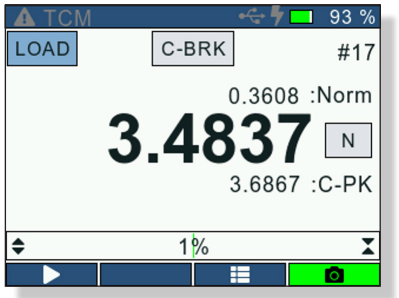
With the **DFS3** you are always sure to have the latest firmware on your device.
Our cloud-based software AMETEK **Device Agent** helps you identify the latest firmware and get it updated in only 60 sec.

Color Display
A large, easy-to-read full color LCD can display readings, icons, and visually indicate gauge or test status using various colors.

Function Keys
The rubber keypad features dedicated and dynamic function keys. The function keys correspond to displayed options and guide the user during operation.

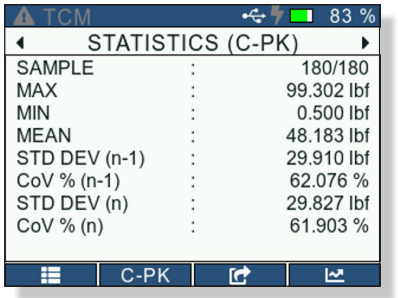
Cursor Keys
Use the cursor keys for method, navigation, mode, and unit change.

Results and Statistics on Board

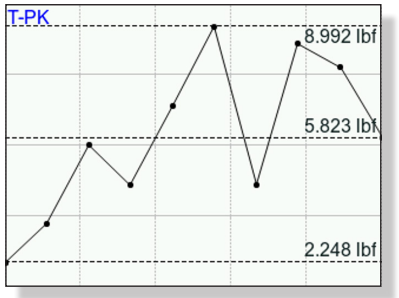


Live result screen with run number, pass/fail indicator, units, and display mode.

Saved results on the internal 32 GB SD card can be viewed and exported.



Statistics on saved results can be exported…



and a plot of saved results with Max and Min Average value can be displayed.

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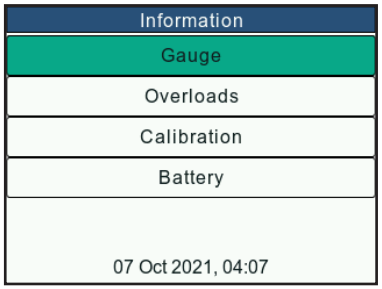
Functions and Features

Test Information and Configuration

One of the significant innovations of the **DFS3** is to offer simplified menu navigation.
The user interface has intuitive and customizable navigation. With just a few clicks, you can access key information about your device, Test Method, and Measurements.

Gauge Information

The menu "Gauge Information" shows all important information about your **DFS3**: serial number, firmware version, number of overloads and latest results, past and future calibration dates, battery status...

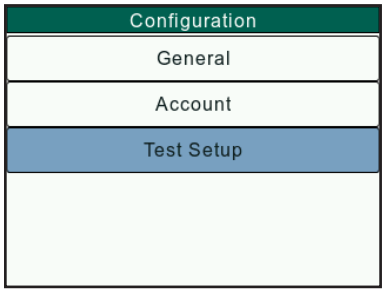


Configuration

Access the general settings of your gauge as well as the specific parameters of your test.

Apply password protection to avoid unautorized changes.

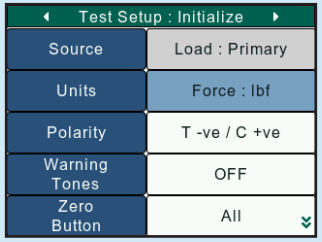
Up to 5 test setups can be configured and executed with a single click.



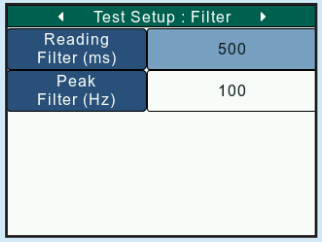
Configuration Test (Test Setup)

Get a great-looking, simple, and intuitive user experience by creating your own Test Configuration and customization with a clear method workflow.

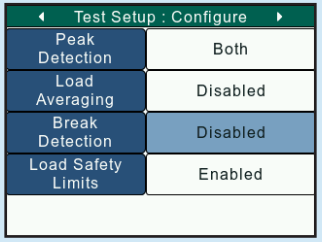
Units



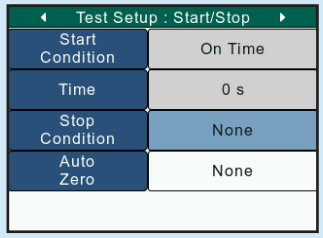
Filters



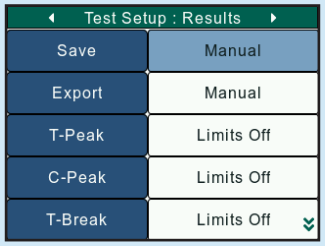
Configuration



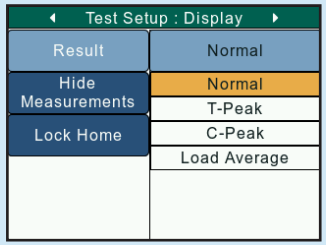
Start/Stop



Results



Display



AFM and AQM External Sensors

Versatility and Simplification

The external sensors: **AFM** external load cell, and the **AQM** external force transducer, can be used together with our force gauge **DFS3** to offer ultimate flexibility when performing different types of tests in various applications without having to constantly change settings. All settings can be preconfigured so that the sensors are ready for use, and this especially increases the effciency when doing repeated testing day-after-day.

Up to two external sensors can be connected in the **DFS3** force gauges. Together with the internal loadcell, the full set-up provides a 3-in-1 device. The force gauge shows the results from one sensor at a time, so that there is no doubt as to which sensor the results come from.

It is easy to connect the two external sensors - they both have an ADC inline box, which ensures a stable digital signal and enables the force gauge itself to identify them with a single click. The digital communication offers an improved accuracy and keeps the calibration information stored within the external device, meaning it can be used by other gauges without affecting readings. This makes it plug-and-play.

External loadcells AFM

Capacities from 0.5lbf to 1000lbf (2.5N to 5000N)

Accuracy: 0.1% FS

** Sensors presented with a **DFS3-025***

External Torque Transducers AQM

Capacities from 3in-lbf to 200in-lbf (0.35 Nm to 20 Nm)

Accuracy: 0.3% FS

Automate with ForceTest

Expand Functionality

The **ForceTest software** expands the functionality of your Chatillon **DFS3** force gauge. This easy-to-use Windows-based software interfaces directly to your digital force gauge enabling you to automatically perform tests and graphs using a personal computer.

Test results can be followed directly on the screen while the test is running.

Intuitive User Interface

The colorful and intuitive user interface ensures that tension, compression, torque, peel, and friction tests are simple to set up. Custom chart colors can be set for easy viewing.

Units of measure, fonts, titles, and force measurement resolution can also be customized through the **ForceTest software**.

Easy Export and Reporting

Test results are presented in a spreadsheet format allowing you to analyze and manipulate data and perform common mathematical and statistical calculations.

Results may be displayed graphically versus time. Tabular results are displayed and can be used to create relationships, queries, or used to produce reports.

Test results can be exported to a .csv format. Graphs and test results can also be exported directly to PDF and Word formats.

Wide Variety of Options

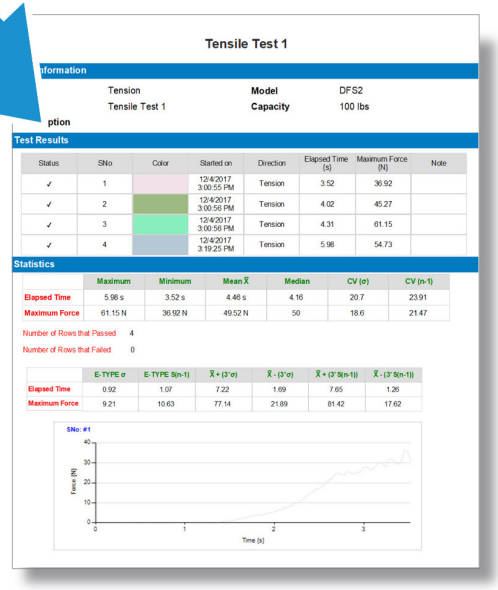
The **ForceTest software** captures maximum force during a time window, average force, and much more.

Basic force measurements such as tensile and compression test formats, pull to limit, and compress to limit are performed by clicking just a few buttons.

Reduce Setup Time

To reduce setup time, the **ForceTest software** offers pre-set templates. It also empowers its user to auto load the latest test performed, and to open previously saved tests for use as a template for new tests.

Free of Charge with the DFS3 Series



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Accessories

Supplied Ready-To-Go

Regardless of the configuration, your **DFS3** is supplied ready-to-go. The gauge and accessories are supplied in a durable carrying case that is designed for all components including adapters and a USB charger. The units are powered by an internal, rechargeable Lithium-Ion battery. The included accessories cover a hook, compression tip, pointed tip, chisel tip, and a notch tip: everything you need to get started.

Accessories List (◆ Indicates an accessory included with the gauge.)

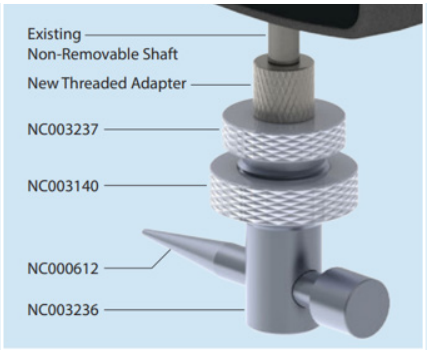
Chisel Point, 110 lbf	◆ SPK-FMG-008A
Chisel Point, 550 lbf	◆ SPK-FMG-008B
Point Adapter, 110 lbf	◆ SPK-FMG-009A
Point Adapter, 550 lbf	◆ SPK-FMG-009B
Notch Adapter, 110 lbf	◆ SPK-FMG-010A
Notch Adapter, 550 lbf	◆ SPK-FMG-010B
Flat Adapter, 110 lbf	◆ SPK-FMG-011A
Flat Adapter, 550 lbf	◆ SPK-FMG-011B
Hook, 50 lbf	◆ SPK-FMG-012A
Hook, 110 lbf	◆ SPK-FMG-012B
Hook, 550 lbf	◆ SPK-FMG-012C
Carrying Case	◆ SPK-DF-118

Options

Extension Rod, 6" (152mm), #10-32	SPK-FMG-013A
Extension Rod, 6" (152mm), 5/16-18	SPK-FMG-013B
Pistol Grip	SPK-FMG-141
Swivel Hook, 50 lbf	ML3867
Swivel Hook, 110 lbf	ML3850
Swivel Hook, 225 lbf	ML3869
Swivel Hook, 550 lbf	ML3868
Hook, Latch	NC002500

5/8 Eye End Kit with Grip Pin for Gauges	SPK-TCM-001
Shaft, Load Cell to 5/8 Eye End, 5/16-24M	NC003235
Upper Eye End Adapter, 5/8" to 5/16-18F Rev A	NC003236
Locking Ring Rev –	NC003140
Locking Ring – Eye End, 5/16-18F Rev A	NC003237
Use PIT/0169/00 Pin, Small Grip Rev 5	NC000612
Adapter, 5/16-18M to 5/16-18F THRD. for 5/8 Upper Eye End, DFG3	NC003254
Adapter, 5/16-18M to 10-32F THRD. for 5/8 Upper Eye End, DFG3	NC003255

Handle Assembly, DFE3/DFS3	SPK-DF3-HANDLE



Kit, DF Metric Couplers #10-32_M6; 5/16-18_M6; M8_5/16-18	SPK-TCM-033
Coupling #10-32 Female to M6x1mm Female Rev –	NC002652
Coupling 5/16-18 Female to M6x1mm Female Rev –	NC002658
Adapter, Threaded, M8x1.25 to 5/16x18, DFG3	NC003256

Battery Charger, Universal, with Cable	◆ SPK-DF3-UNIV
Cable, USB-C/USB-A, 3 FT, Black	6885
Adapter, Wall Mount, AC/DC, 5V, 5W, USB-A	6886
Kit, AC Adapter for P/N 6886	6887

Force Test DF2 & DF3 Software	◆ SPK-DF-FORCETEST

SPK-TCM-001

The redesigned grip and fixture connection kit offers more flexibility with a wide range of fixtures.

Notes

Accessories are capacity dependent.

Accessories used with capacities below 110 lbf (500N) will generally have a #10-32 thread.

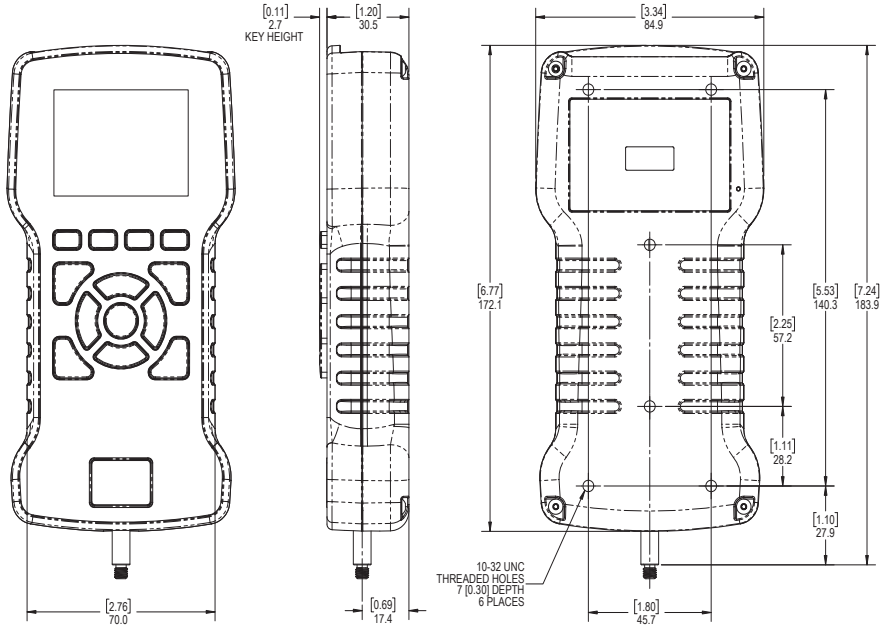
Accessories for higher capacities generally have a 5/16-18 thread.

Specifications and Dimensions

Specifications

Accuracy	±0.1% of Full Scale
Maximum Overload	150% of Rated Capacity
Resolution	Up to 100,000 resolution points (according the Unit & Capacity)
Peak Capture Rate	30 kHz
Data Sampling	30 kHz
Display Update Rate	10 Hz
Data Save (internal 32Go SD Card)	Up to 1000 Results
Loadcell Thread End (10 to 100 lbf)	#10-32
Loadcell Thread End (200 & 500 lbf)	5/16-18 UNC
Power	Battery (Lithium Ion) or via the USB-C port
Battery Life	With Dimming On: 40 Hours With Dimming Off: 30 Hours
Operating Temperature	40 to 110°F (5 to 45°C)
Relative Humidity	20 to 85% non-condensing
Instrument Weight	1.1 lbs (0.5 kg)
Shipping Weight	4 lbs (2 kg)

Dimensions



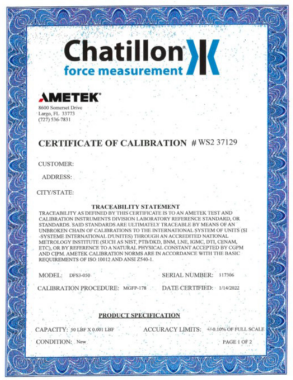
Supplied Equipment

Carry Case & Accessories - DFS3

The **DFS3** comes in a carrying case, ensuring your device is protected.
Accessories, charger, and calibration certificate are supplied as standard.

Calibration Certificate - DFS3

The calibration of the **DFS3** is carried out with the utmost care by our metrology experts.
All our **DFS3s** are delivered with a calibration certificate and a tensile and compression measurement reading.



Ports - DFS3

The **DFS3** is equipped with a USB-C port to export results in ASCII (LIMS) or via the included Chatillon **ForceTest** software, two AUX inputs for **AFM** and **AQM** external sensors, and a port for **TCM** machines.

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Product Code Configuration

Chatillon force measurement AMETEK

Models Accuracy: 0.1% / Capacity

	N		kgf		lbf		gf		ozf	
Model	**Capacity**	**Resolution**	**Capacity**	**Resolution**	**Capacity**	**Resolution**	**Capacity**	**Resolution**	**Full Scale**	**Resolution**
DFS3-250G	2.5000	0.0001	0.25000	0.00001	0.50000	0.00001	250.00	0.01	8.0000	0.0001
DFS3-002	10.0000	0.0001	1.00000	0.00001	2.0000	0.0001	1000.00	0.01	32.000	0.001
DFS3-010	50.000	0.001	5.0000	0.0001	10.0000	0.001	5000.0	0.1	160.00	0.01
DFS3-025	100.000	0.001	10.0000	0.0001	25.000	0.001	10000.0	0.1	400.00	0.01
DFS3-050	250.00	0.01	25.000	0.001	50.000	0.001	25000	1	800.00	0.01
DFS3-100	500.00	0.01	50.000	0.001	100.000	0.01	50000	1	1600.0	0.1
DFS3-200	1000.00	0.01	100.000	0.001	200.00	0.01				
DFS3-500	2500.0	0.1	250.00	0.01	500.00	0.01				

Ordering Information

Model	Force	External Load Cell - Force (Lbf/N)	External Torque Transducer - Force (Lbf.in/N.m)
DFS3	0,5Lbf /2.5 N..... **-250G**	No external Load cell (omit)	No external Load cell (omit)
	2Lbf /10 N ..... **-002**	0,5Lbf /2.5N..... **-AFM-250G**	3Lbf.in /0,35N.m..... **-AQM-0003**
	10Lbf /50N..... **-010**	2Lbf /10N ..... **-AFM-002**	12Lbf.in /1,25N.m..... **-AQM-0012**
	25Lbf /100N..... **-025**	10Lbf /50N..... **-AFM-010**	50Lbf.in /5N.m..... **-AQM-0050**
	50Lbf /250N..... **-050**	25Lbf /100N.....**-AFM-025**	100Lbf.in /10N.m..... **-AQM-0100**
	100Lbf/500N.....**-100**	50Lbf /250N..... **-AFM-050**	200Lbf.in /20N.m..... **-AQM-0200**
	200Lbf/1000N.....**-200**	100Lbf /500N..... **-AFM-100**	
	500Lbf/2500N.... **-500**	200Lbf /1000N..... **-AFM-200**	
		500Lbf /2500N..... **-AFM-500**	
		1000Lbf /5000N.. **-AFM-1000**	

Example :

DFS3 - 050 - AFM - 1000

DFS3-050 50Lb (250N) internal sensor, with an external force sensor of 1000Lb (5000N) **AFM-1000**.

The **DFS3** series innovates by offering a two-in-one device allowing the use of the internal sensor and also external sensors without having to acquire a new device.

The **DFS3** can be ordered as stand-alone or ordered as a bundled solution with the external sensors. Please see separate datasheet for specifications on the AFM and AQM sensors.

You can thus purchase:

- The **DFS3** gauge with its internal sensor and then in a few months or years add an **AFM** external force sensor and / or an **AQM** external torque sensor,
- or, initially choose a **DFS3** including its internal sensor and an **AFM** external force sensor or an **AQM** external torque sensor.

The attached configurator allows you to configure the product code corresponding to your wishes.

For example:

For a **DFS3** with a 100Lb (500 N) internal sensor: **DFS3-100**.

For a **DFS3** with a10Lb (50 N) internal sensor, and a 500LB (2500 N) external force sensor: AFM-0500: **DFS3-010-AFM-0500**.

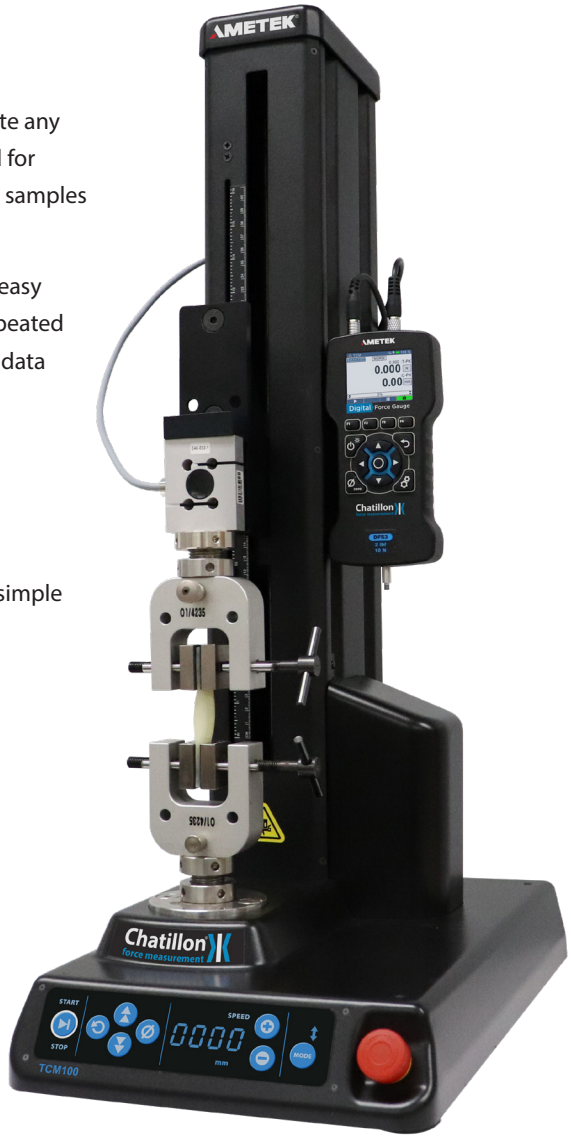
For a **DFS3** with a 10Lb (50 N) internal sensor, and a 50Lb.in (5Nm)external torque sensor: AQM-050: **DFS3-010-AQM-050**.

DFS3 with the motorized TCM

Get greater flexibility in application solutions

To benefit from a more stable and reliable test speed, the **DFS3** can be combined with a **TCM** Motorized Test Stand. This helps to eliminate any variables that might impact the force readings and offers an ideal solution for force measurement testing. The **TCM** series is well adapted for production environments and attached with the **DFS3** digital force gauges makes tensile, compression, peel, and flexural testing of your samples an easy task.

In this solution, you get a powerful stand-alone solution for product testing, where the **DFS3** force gauge can display the **TCM** travel for easy positioning of the moving crosshead. The **TCM** will stop at break or stop at the limit set on the gauge. This solution is also ideal where repeated measurements are required. Here, the **TCM** series will ensure that the test is carried out in exactly the same way every time, thus making data collection easier and more comparable.



Benefits with the ForceTest software

Adding the Chatillon **ForceTest** software will power up your **TCM** Series force testing solution and will turn your analysis into a fast and simple process. By combining the **DFS3** force gauge and the **ForceTest** software with the **TCM** Series you obtain:

- Unique solution with powerful and modern UI in **ForceTest** software
- Plotting of Force (**DFS3**)
- Setups for Force (Tension or Compression) Torque, Friction and Peel
- Library of results and calculations (**ForceTest**):
  - Peak (T & C)
  - Maximum; Minimum; Average for complete test or, on a specific area of research
  - Friction test setup with COF results
  - Peeling test setup with peeling resistance results
  - Selectable Break detection for either software or DF3 readings
  - Torque test setup
  - Adjustable data rate
  - Live graph with autoscaling
  - Statistics
  - Export to XLS or CSV and PDF report
- Report Designer
- Validation mode for importing known data set in CSV format. Useful in IQ/OQ installation process

USA, Florida
Tel +1 (800) 527 9999
test.sales@ametek.com

India
Tel +91 22 2836 4750
test.sales@ametek.com

Singapore
Tel +65 6484 2388
test.sales@ametek.com

China, Shanghai
Tel +86 21 5886 5111
test.sales@ametek.com

China, Beijing
Tel +86 21 8526 2111-19
test.sales@ametek.com

United Kingdom
Tel +44 (0) 1243 833 370
test.sales@ametek.com

France
Tel +33 (0) 30 68 89 40
general.lloyd-instruments@ametek.fr

Germany
Tel +49 (0) 2159 9136 510
info.mct-de@ametek.de

Denmark
Tel +45 4816 8000
test.sales@ametek.com

SS-DFS3 ISSUE 2111

For detailed specifications go to the Data Sheet at ametektest.com

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Chatillon® force measurement

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