TENSILON®

Universal Material Testing Machine
RTG Series

RTG

- Class 1 accuracy testing machine
- Highly accurate measurement control technology enabling sensor and machine connection
- Rated output accuracy of up to 1/500 guaranteed

A&D ...Clearly a Better Value

A&D Company, Limited
http://www.aandd.jp

A&D's Universal Material Testing Machine TENSILON, which was developed using our superior knowledge of force sensor and measurement control technology, enables connection between sensors and machines. Our strength in this field is well-known and A&D has gained worldwide recognition from a range of businesses and laboratories.

We are very proud of our sensors, which are built to industry standard specifications. They are used not only for electronic balances, plant equipment and engine testing systems but also for use in national standard instruments.

Our measurement control system at the core of our testing machines offer the highest accuracy and most rapid calculation in the world.

Its operation is even more advanced when teamed with MATLAB/Simulink and GUI configuration tool VirtualConsole software.

The TENSILON RTG is our newest universal testing machine providing cost-effective measurement with a higher level of accuracy.

Compact, high performance
RTG series

RTG-1310, RTG-1250
RTG-1225, RTG-1210

Table models / Maximum capacity of 10kN to 1kN
Maximum effective stroke of 420mm.

Performance

Reliable, high performance TENSILON RTG series

Class 1

Load measurement accuracy

Highly accurate Class 1 testing machine

The TENSILON RTG series is fully compliant with ISO/IEC17025, as well as all measurement law requirements.The force sensor load cell developed for the TENSILON models has a built-in calibration circuit and a rating capacity function for easy calibration.

Load range

Rated output accuracy of up to 1/500 is guaranteed (Load range can be automatically set)

1 msec

High-speed sampling 1 msec

13 channels Max

A maximum of 13 input signal channels

Load/displacement data can be saved in a USB memory. High-speed sampling of input signals (including load/displacement) of up to 13 channels

COLOR

Color touch panel

Visibility and operation are substantially improved with color display of operation status and data.

12 types

Various operational environments

To fulfill diverse user needs, the color touch panel, MSAT, commander and display can be combined to create a flexible operational environment.

Color touch panel

The color touch panel offers superb visibility and easier operation

Color display (data) : The touch panel displays digital values as well as stress and strain curves.
(Operation buttons): These buttons are highlighted in color and with symbols for easy recognition and to prevent errors during operation.
(Setting items): Input columns and verification of conditions are easily distinguishable with background colors to prevent errors during operation.
(Option items): Pull-down menu options in the same format as Windows (▽).

Analog record: Usable with an XY analog recorder or the AR-6600 series analog recorder, for the RTF and RTG series.

Digital record: Load and displacement data can be digitally converted to be saved in a USB memory.

Measurement conditions memory: Up to 10 measurement conditions files can be saved in the memory. It is useful to register measurement conditions that are used frequently so that the operator can start a new measurement with ease.

Automatic back-up/start-up system for measurement conditions: The last measurement conditions just before the machine is turned off will be automatically saved. When the machine is turned on again, it will begin operating with these saved measurement conditions so the operator can easily begin a new measurement.

Test speed: Condition settings of constant crosshead speed (mm/min), constant load increase speed (N/min) and constant elongation speed (mm/min) come as standard [extensometer is optional].

Test mode: Standard test (tensile/compression/bending) mode, Cycle test mode and Creep test mode.

Load verification mode: A load verification can be performed using A&D's load cell loop dynamometer, the AD-1661 (sold separately).

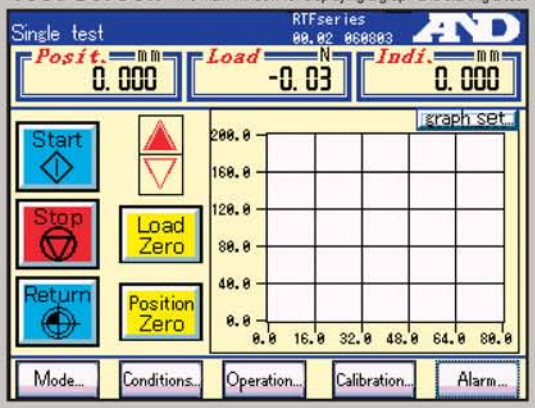
Displacement and load display resolution: Up to 1/1000.

Touch panel positioning:The sliding touch panel can be easily moved up or down. It can also be attached to either pole.

(Factory option: Please specify which pole you would prefer to have it attached to.)

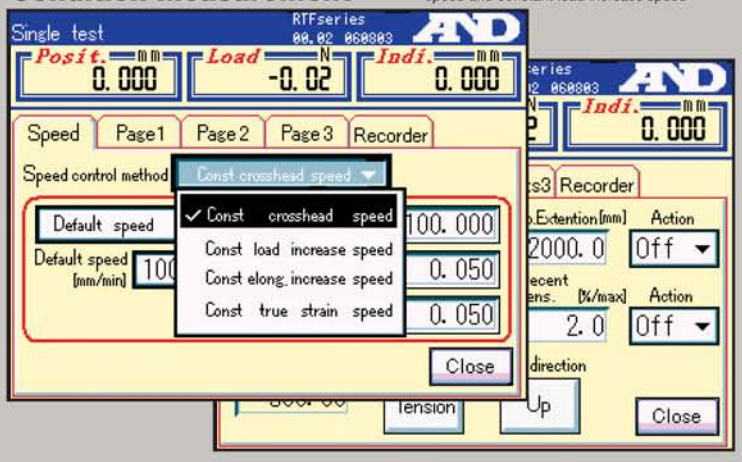
Test Screen

The main window for displaying a graph and starting a test



Condition Measurement

Setting test speed, such as constant crosshead speed and constant load increase speed

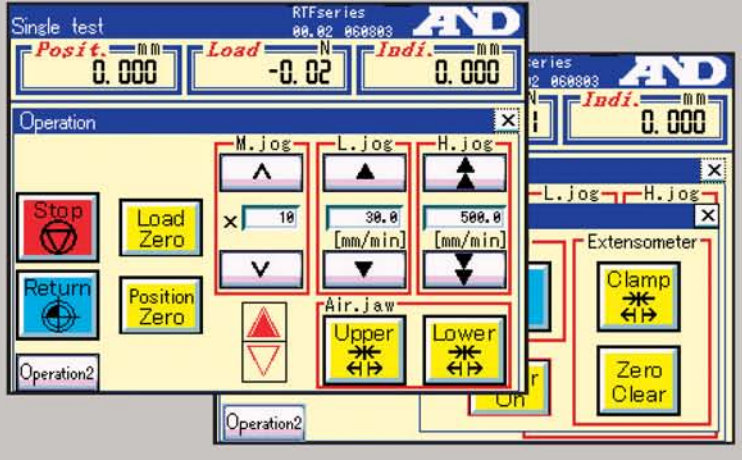


Mode Selection

Select testing mode

Operation Window

Ultra-fine, fine and coarse adjustments possible



MSAT (Multi Signal Analysis Testing)

Data processing software for comprehensive control of a testing machine

The MSAT series is equipped with functions for not only testing machine operation but also data analysis, calculation and data storage for each testing mode. The operator can select Standard test (tensile, compression and bending) mode, Peeling test mode, Cycle test mode, Creep test mode, Stress relaxation test mode, etc., depending on the purpose of the test.

Measurement conditions file: Each measurement conditions file can be managed as an independent file using Windows Explorer.

Measurement conditions file configuration: Five basic windows detailing sample information, machine condition, analysis condition, graph display and table display with each window's functions categorized for easy operation.

Displaying and hiding settings: Measurement conditions file settings can be omitted from the screen. By hiding unwanted items from view, errors in setting will be eliminated leading to more efficient operation.

Restriction of settings input: Input of setting items can be restricted to avoid input errors.

Changing names: The name of each setting can be easily changed to suit the user.

Graph Window: An ongoing load and displacement graph can be displayed in real-time during the measurement. Different graph types such as single display, overlaying (comparison between current data and previous data) or inching are possible.

Arbitrary formula: Easy table calculation is possible by applying an arbitrary formula to data from sample dimensions and maximum point data obtained from load and displacement data.

Data browsing and processing: Previous data can be easily retrieved from the database structure employed for data storage. Easy data browsing and tabulation are also possible with Windows-based standard interface (ODBC).

Data export: Measurement conditions, analysis values, and load and displacement curves of measured data can be exported into a text file format or an Excel file format. With an Excel file format, tabulation and graphing are very simple and the copying and pasting of such graphs and tables is also possible.

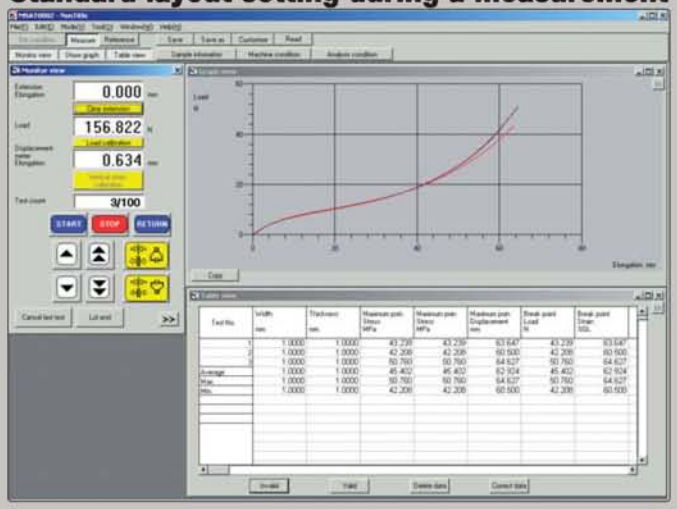
Quick judgment: The upper and lower limits of the validity judgment of a result can be set in advance so that judgment can be made during measurement.

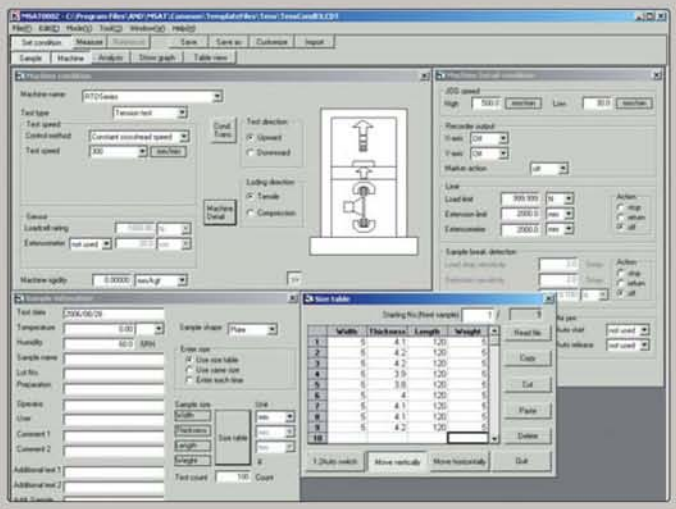
Reanalysis: Using the Reanalysis button, data can be reanalysed with the cursor on a load and displacement graph.

Recalculation: It is possible to recalculate a measurement result of previous data under altered analysis conditions.

Personal computer operation environment	OS:Windows XP Professional (English). CPU:Pentium III 1GHz or faster. Memory requirement:512Mb or over. Authority requirement: Administrator authority. USB: One USB port. Display resolution: 1024x728 dots or higher color display.

Standard layout setting during a measurement





Status Display Window

A test can be started or stopped on the screen, and fine or coarse adjustments of the moving crosshead can also be performed.

Graph Display Window

An ongoing load and displacement graph can be displayed in real-time during the measurement. Different graph types such as single display, overwriting or inching are possible. The operator can easily make a comparison between current measurement data and previous measurement data with an inching graph.
Displacement [mm], strain [dimensionless] or elongation [%] can be plotted on the X-axis. Load [force unit N, etc.] or stress [stress unit Mpa, etc.] can be plotted on the Y-axis.

Table Display Window

Load/stress/displacement/strain values at the maximum point, load/stress/displacement/strain values at the break point, elastic modulus, load/stress/displacement/strain values at the offset point, load/stress/distortion/strain values at the proof stress, load/stress/displacement/strain values at the 6 intermediate points, sample dimensions, etc. can be set and calculation results will be displayed immediately after the completed measurement. Statistical values such as maximum/minimum within number of data, average/deviation, 3σ (standard deviation x 3), etc., can also be displayed.

Operation Conditions Window

The crosshead speed (test speed setting) and automatic load cell rating recognition can be confirmed on the screen.

Detailed Conditions Window

By clicking on the screen, settings for the recorder (if used), load/displacement limit values for the testing machine and status of the testing machine during limit operation, etc. can be input.

Sample Information Window

Sample information can be input on the screen. Up to 7 items in reference to the sample, test date, name of test operator, etc. can be entered and these items will be targeted for data acquisition.

Dimension Table Window

The dimensions of each sample can be input in advance on the screen in order to perform the specified measurement and calculation and therefore reduce test duration.

Display & Commander

RTG series with user interface for advanced operation

Display

Detachable digital display for load and displacement indication. This display can be attached with magnets to any part of the machine and it does not obstruct the user when fixing a sample to the jig or testing a sample as its position can be freely adjusted.

Load

6-digit indication
The indication unit will be automatically selected from kN, N, mN or μN.

Displacement

1/1000 display at minimum

Fixing method	Magnet attachment method
Display data	Load/displacement
Load	6-digit indication
Displacement	6-digit indication

The detachable display offers a more organized and efficient workspace.

Commander

The commander's manual operation buttons are ergonomically designed with bright colors and varied sizes for superior ease-of-use. The jog dial on the right hand side of the commander offers extra flexible control and the operator can move the crosshead up and down by manually rotating this dial.

START
This button starts a test. The indicator lights up to show movement direction (up or down) of the crosshead.

STOP
This button stops machine operation. When pressed, the touch panel and/or MSAT stop measuring data.

RETURN
This button returns the crosshead to its original starting point. The movement slows down around this point to stabilize and provide an accurate return.

Manual Jog
The jog makes fine manual adjustments of the moving crosshead possible.

Up
This button controls minor upward adjustments of the moving crosshead.

Up (fast)
This button controls major upward adjustments of the moving crosshead.

Down
This button controls minor downward adjustments of the moving crosshead.

Down (fast)
This button controls major downward adjustments of the moving crosshead.

Air Jaw (Upper)
This button opens or closes the upper jaw when the air jaws are in use.

Position Zero
This button returns the crosshead to its original starting point.

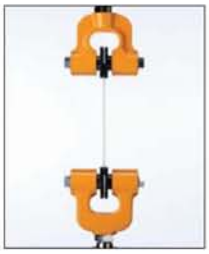
Air Jaw (Lower)
This button opens or closes the lower jaw when the air jaws are in use.

Extensometer (Clamp)
This button opens or closes the contacts of the contact type extensometer between gauge marks(GL).

Application

A&D's wide range of applied products for even more advanced applications

Applied test jigs for strength measurement



Screw action jaws

Applicable load: 1N (100gf) – 5kN (500kgf)

These are screw action jaws, which are tightened by hand and suitable for use with low or mid-capacity tests. Various types of jaw faces are available depending on the size and shape of the test sample.

Air jaws

Applicable load: 50N (5kgf) – 10kN (1tf)

These are screw action jaws suitable for use with low or mid-capacity tests. Various types of jaw faces are available depending on the size and shape of the test sample.

The tire cord air jaws specifically used for cords or threads are also available.

Compression test jig

Applicable load: 25N (2.5kgf) – 10kN (1tf)

This jig is composed of a compression anvil mounted on the base of a testing machine and a load cell sensitive plate mounted on a load cell, and is designed to correspond with testing machine and load cell capacities.

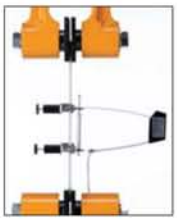
Compression type bending test jig

Applicable load: 1kN (100kgf) – 10kN (1tf)

This bending test jig meets various testing standards such as JIS, ISO, ASTM, etc.

Applied testing devices for elongation measurement

- Strain gauge device for measuring distance between gauge marks (for a plate and a rod)
- Non-contact type extensometer between gauge marks: U-4410
- Contact extensometer between gauge marks: U-4310D



SG series strain gauge device for measuring distance between gauge marks

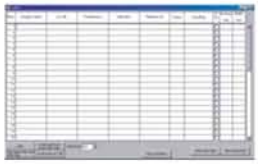
This compact and lightweight strain gauge extensometer is attached to a test block, which measures the elongation between gauge marks. Various types of SG are available depending on the distance between gauge marks or the volume of the extension.

Non-contact extensometer between gauge marks **U-4410**

This is an electronic optical / detecting system extensometer that makes high-precision measurement of the distance between gauge marks possible without any contact.

Applications

LOT SET Application



When used with the MSAT0002 / 0003 series, sample information will be automatically saved in a table format with the measurement result after each set of completed tests.

Excel PU

When Excel PU is used with the MSAT0002 / 0003 series, it is possible to overwrite the saved averaged S-S curves on an Excel graph to display a comprehensive outline of results.

Data Recorder

Analog recorder **(AR-6600-7)**

This recorder is equipped with a control panel providing easy setup with one-touch zero-span adjustment and auto ranging.

Load frame & recorder table

	Dimensions (mm)
For RTG-1310, RTG-1250, RTG-1225 and RTG-1210	680(W)x555(D)x630(H)

Wing (sold separately)
420mm(W)x430mm(D)
Can be mounted on either the right or left side.

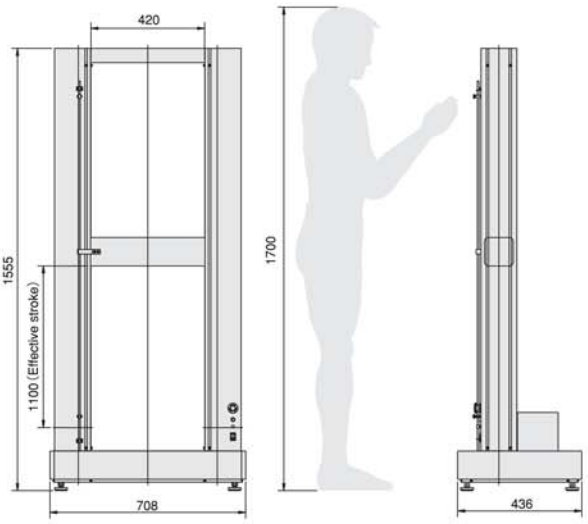
Applied testing devices for temperature / environment test

- Constant temperature / constant humidity testing devices
- High temperature in gas atmosphere testing devices
- High temperature testing devices
- High temperature in vacuum testing devices
- Ultra-low temperature testing devices
- Dipping testing devices

Constant temperature and constant humidity testing instruments

Model	Temperature range	Remarks
TKC	RT to +270℃	
TLF	-35℃ to +270℃	Cooling using refrigerator
TCF	-60℃ to +270℃	Cooling using liquid CO_2
TCLF	-60℃ to +270℃	Cooling using refrigerator and liquid CO_2
TLF_2	-65℃ to +250℃	Two-step refrigerator
TNF	-150℃ to +250℃	Cooling Liquid N_2
TLF・HS	-35℃ to +270℃	Cooling using refrigerator with temperature adjustment

Model	RTG-1310	RTG-1250	RTG-1225	RTG-1210
Table / Floor model	Table model			
Loading system	Closed-loop microcomputer controlled digital servomechanism			
Maximum capacity	10kN	5kN	2.5kN	1kN
Effective test width	420mm			
Crosshead stroke	1100mm			
Effective stroke	580mm	690mm	665mm	775mm
Crosshead speed	0.05～1000mm/min			
Crosshead speed accuracy	±0.2%			
Crosshead random speed	0.01mm/min step in crosshead speed range			
Crosshead speed and load capacity	Maximum load capacity in full speed range			
Crosshead return speed	1000mm/min or 500mm/min			
Load measurement accuracy	±1% of reading (within range of 1/1 – 1/500 of load cell rating)			
Load range	Fully automatic range switching (up to 128 folds)			
Load calibration	One touch operation load calibration with the calibration circuit embedded in the load cell. Equipped with a load cell rating discrimination function			
Sampling speed	1msec			
Safety function for overload	Provided			
Stroke limiter	Upper/lower limit 2 points			
Dimensions (WxDxH)	708×436×1555 (mm)			
Weight	100kg			
Power supply	100V AC, 1Φ, 50/60Hz, 3m cable with 3-P plug			
Power consumption	350VA		300VA	
Ambient temperature & humidity	Temperature: 5 to 40℃, Humidity: 20 to 80% RH			



RTG-1310, RTG-1250
RTG-1225, RTG-1210

Operation unit		
Item	Touch panel	MSAT series
Method	Select from the touch panel or MSAT (installed in personal computer)	
Applicable model	All RTG series models	
Displacement display resolution	0.001mm	
Input channel	Maximum 13 channels (including load, crosshead movement and external displacement gauge)	Maximum 3 channels (including load, crosshead movement and external displacement gauge)
Output channel	2 channels for analog data of load and elongation	
Data storage method	CSV method (up to 12 input channels for digital data)	Database file
Storage media	USB memory (at user's end)	PC hard disc
Sample break detection function	Provided	
Return function to the original point	Provided (slowing down the return speed around the origin to eliminate misalignment)	
Air (pneumatic) jaw open/close function	Provided (Air jaws are required)	

A&D has received uniaxial testing machine calibration accreditation

A&D Company Limited was assessed by the National Institute of Technology and Evaluation to meet the requirements of the measurement law, relevant regulations and JIS17025 (ISO/IEC17025 compliant) and received calibration accreditation with regard to uniaxial testing machines. This allows us to issue certificates of calibration with the official accreditation symbol of Japan Calibration Service System (JCSS), which ensures conformity with the requirements of the measurement law, with regard to uniaxial testing machines. In order to ensure the reliability and safety of each product, the functions and performance of a material testing machine must be maintained and controlled at a high level. A&D will examine material testing machines and offer technical services to our customers based on our advanced skills and extensive experience.

JCSS 0107

Mass and uniaxial testing machines accreditation number

A&D Company Limited has been accredited in the field of mass (weight) and uniaxial testing machines. This JCSS accreditation proves conformity with the requirements of the measurement law and the number 0107 has been accredited and provided to our calibration department.

Calibration request

●At A&D, there are two types of calibration: JCSS calibration and in-house calibration. JCSS calibration: A&D will issue a certificate with the JCSS accreditation symbol proving conformity with the requirements of national measurement standards. This certificate is suitable for the quality test of products for trade (a flat rate to be charged). In-house calibration certificate: This calibration is performed according to our in-house calibration procedures to meet our customer's quality control requirements. We will issue a certificate and a traceability with regards to the standard devices used (a flat rate to be charged).

●Please submit your calibration request to your local sales representative.

●Calibration cost: Our quote will be based on the type of testing machine and the type of calibration, and will also include accommodation and transportation costs depending on the calibration location, etc. Please contact an A&D sales representative for further details.

AD-1661 series load cell loop type indicator for force calibration

*Windows, Windows XP Professional, Microsoft Access and Microsoft Excel are registered trademarks of Microsoft Corporation.

Attention to Safety! ●For proper use, read the instruction manuals carefully before use.

A&D Company, Limited ...Clearly a Better Value

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