C224-E129

SHIMADZU
Excellence in Science

Precision Universal Testing Machines

# AUTOGRAPH AGS-X2 Series

# AUTOGRAPH
# AGS-X2 Series

The Shimadzu AUTOGRAPH AGS-X2 series provides superior performance and practical testing solutions for a wide array of applications. Offering high-level control and intuitive operation, the AGS-X2 series sets a new standard for strength evaluations while providing the utmost in safety considerations in a modern, stylish design.

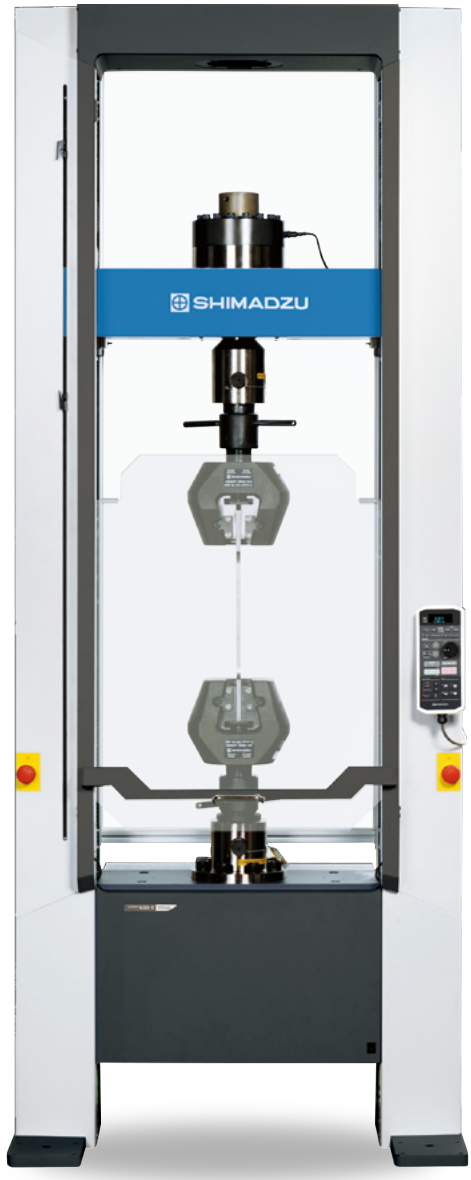
The AGS-X2 comes standard with industry-leading TRAPEZIUM X-V data processing software. Offering comprehensive functions, TRAPEZIUM X-V offers an unparalleled level of operation. TRAPEZIUM LITE X, Shimadzu's entry-level data processing software, provides enhanced productivity and efficiency for quality control operations.


20 kN


50 kN

# PRACTICAL TESTING SOLUTIONS


100 kN



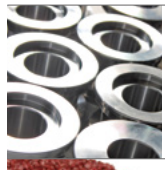
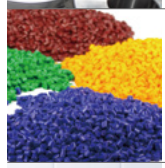

300 kN

# Convincing Cost Performance

## AGS-X2 Provides Practical, Affordable Testing Solutions

### Easy Control of Stress and Strain

Offers real-time auto tuning of control parameters, based on measured test force and strain data. Safely make comparisons to unknown sample data without the need for preliminary tests. In addition, the AUTOTUNING FUNCTION easily performs strain control, an ISO 6892-2009 requirement.

| | Required Needs |
|---|---|
|  IRON & STEEL | In addition to conventional stress control, tensile testing with strain control is increasingly in demand. ISO 6892 JIS Z2241 |
|  PLASTICS & RESIN | Measuring the modulus of elasticity in the ultra-small strain domains proscribed by ISO and JIS standards has become a necessity. ISO 527 ISO 178 JIS K7171 |
|  CERAMICS | Many samples are damaged by microscopic displacements, so accurate control is needed, right from the start of testing. |

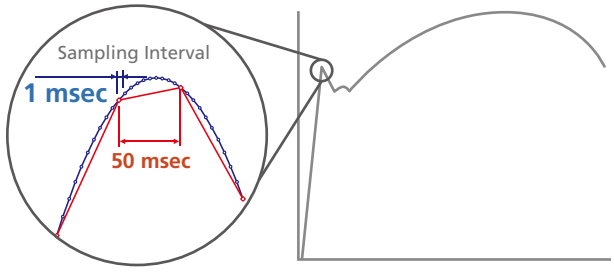
### Achieve an Accurate S-S Curve with High-Precision Load Cells

±0.5 Load Cell Precision

from 1/500 to 1/1 Load Cell Precision Range

1 msec (1000 Hz) High-Speed Sampling

The wide, guaranteed load cell precision range of 1/500 to 1/1 improves testing efficiency and ensures that virtually all of your testing can be performed without switching the load cell or jig. Furthermore, high-speed sampling of 1msec ensures no missed strength changes.




### Improved Safety

#### SAFETY FUNCTION / ONE-TOUCH STROKE LIMIT

The safety function stops the testing machine if force changes exceed a certain level during specimen setting or return.
In addition, setting stroke limiters is easy with one touch of the switch.

#### PROTECTION COVER

Controls scattering of the test specimen during testing. The interlock improves safety: operators can open and close it easily with the slide mechanism.

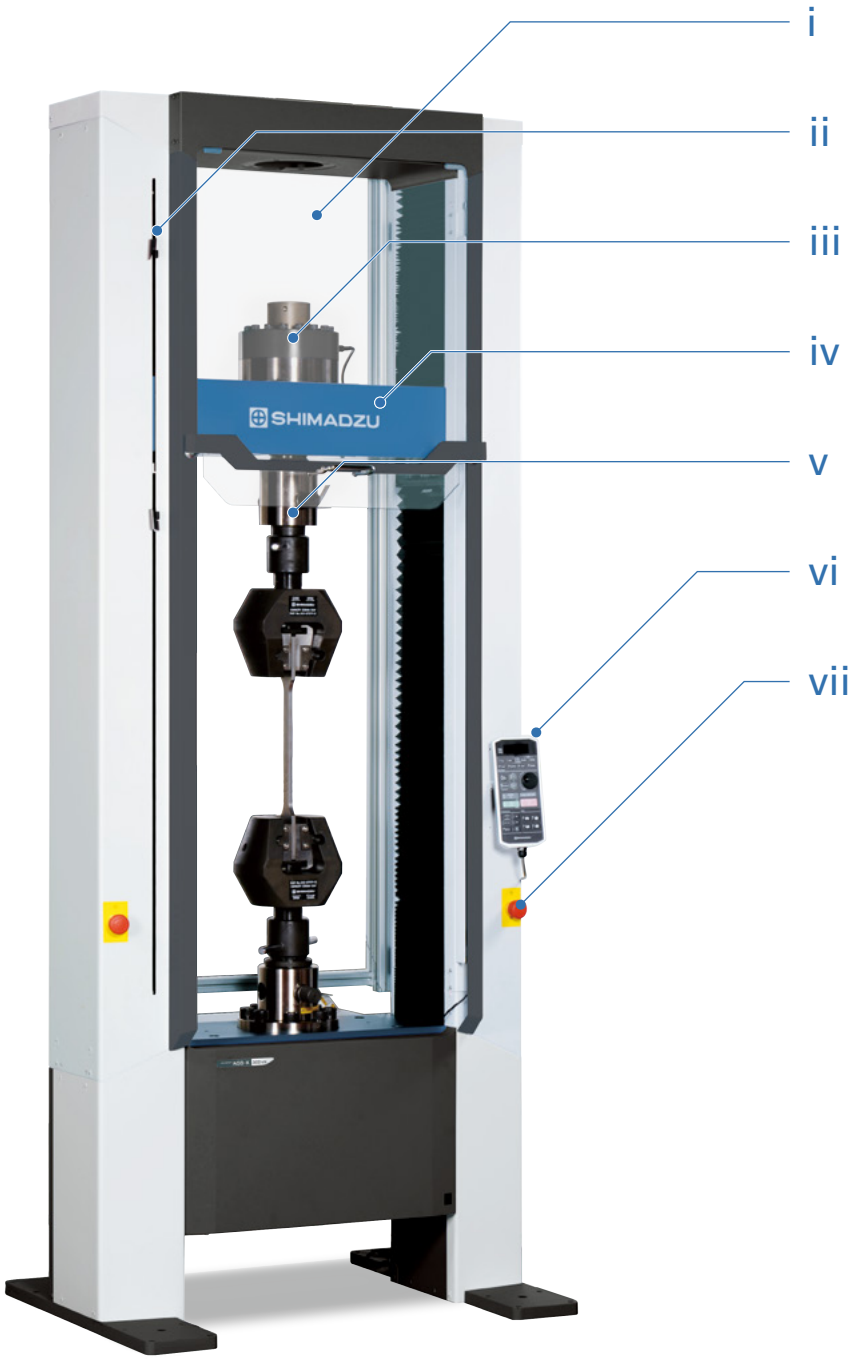
#### DUAL EMERGENCY-STOP SWITCHES

Features emergency-stop switches on both sides (20 kN–300 kN frame).


SHIMADZU
AGS-X2
100 kN

# Smarter Work Space

## New and enhanced functions support easier, more efficient testing



### i Protection Cover to Protect Against Flying Debris

A vertically sliding safety guard is available. Opens easily with one hand. When the safety guard is open, an interlock function disables testing and return movement.

### ii One-Touch Stroke Limiters

Pinch and slide; release to lock. One-touch stroke limiters permit simple one-touch adjustment and firm locking of the crosshead stroke limit positions.

### iii Load Cell

For the range of 1/500 to 1/1 of the load cell rating, a single load cell that guarantees test force accuracy to ±0.5% of the indicated value (for high-precision type) covers an extensive testing range. The load cell rated value is stored in the calibration cable and automatically recognized when the cable is connected.

### iv Crosshead

Achieves a 2,000 mm/min testing speed and a 2,200 mm/min return speed (20 kN frame), significantly reducing the time required to conduct repetitive testing.

### v Common Joint for Both Tensile and Compression Tests (20–300 kN frame)

Adopts a single joint for both tension and compression tests.
This makes it easier to exchange jigs. In addition, the joint is set with a nut placed in the upper part of the loading cell, which allows for safe detachment of the joint on the table.

### vi Main Operation Panel

The main operation panel enables the development and storing of test conditions, allowing testing without having to connect to a PC.
Perform various operations with the jog wheel, such as opening and shutting the button for the automatic extensometer.
The main operational panel is movable, allowing convenient adjustment of the angle.
The display language can be selected as English or Chinese.

- The controller is needed separately for the automatic opening and shutting of jigs.

### vii Emergency Stop Switches

Reliably cuts off power to the servo amplifier, instantaneously stopping crosshead movement in the event of an emergency.

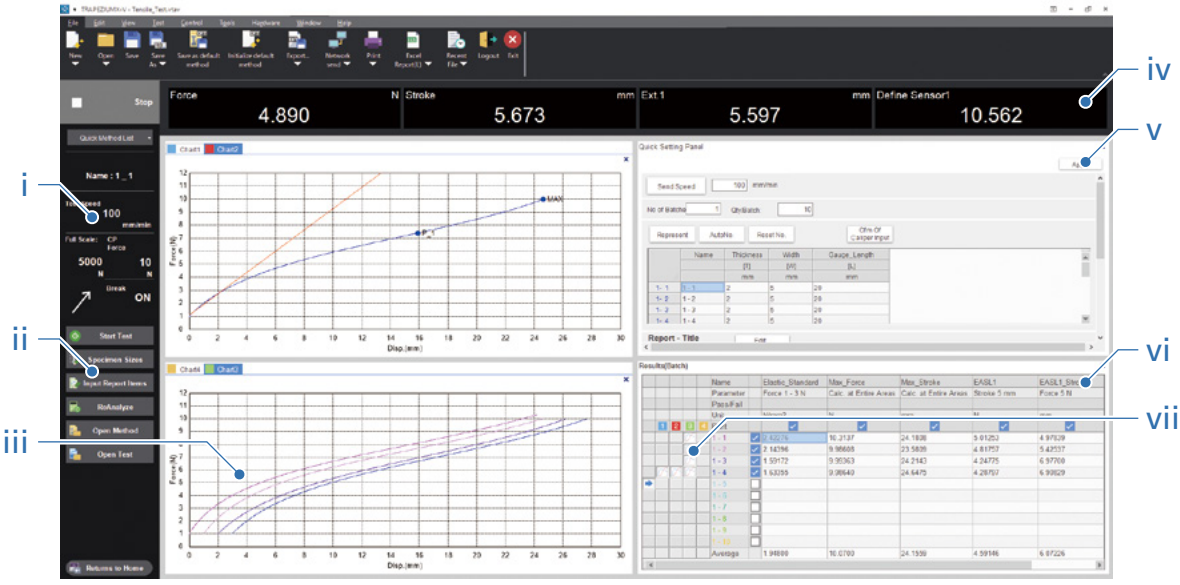
# Quest for Convenience

## *TRAPEZIUM X-V*

Materials Testing Operation Software

Cutting-Edge Software Meets Your Materials Development and Quality Control Needs


### Quickly Obtained Data




#### i Test Method & Situation Panel

Confirm testing conditions and the situation from the main window.

#### ii Advanced Navigation System with a Learning Function

The Navigation Bar shows only the functions required for selected situations. In addition, the "Learning Function" records user actions for each situation and adds frequently-used functions as navigation buttons. This improves work efficiency by matching functions to a user's operational style.

#### iii Multiple Graph Function

Enables displaying up to four graphs. The graph can set two axes, respectively. In addition, a maximum of 50 graphs can be overlaid and point picking allows acquiring the value of a random point. This provides for a more detailed examination.

#### iv Real-time Data Display Panel

Displays the test force, stroke (strain), extensometer or strain gauge value and other input values, enabling one-window monitoring.
In addition, the random calculation value can be display simultaneously for smooth confirmation of data.

#### v Quick Panel

Quickly enter the speed, dimension, and report information from the main window.

#### vi Result Panel

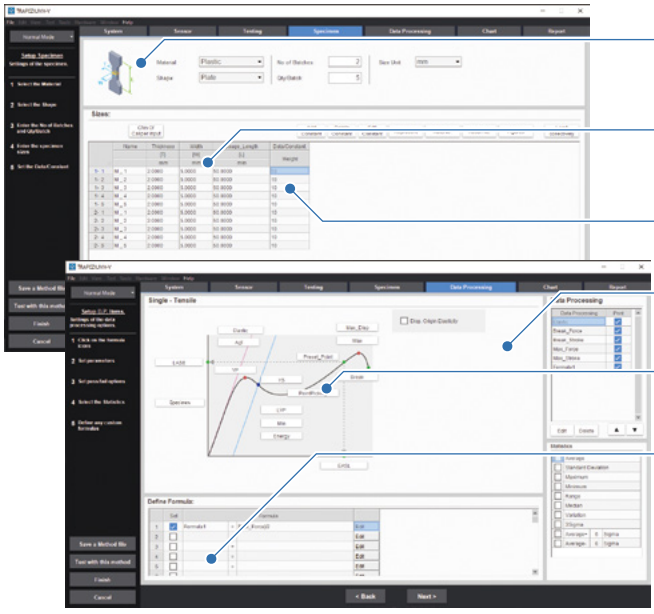
In addition to re-testing and extra lot tests, this panel allows changing a variety of settings before and after testing. Specimens can be inserted in any position or added to only a specific batch, and the specimen order can be changed after completing the test.

#### vii Checkbox to Select Display Curve

## Intuitive Machine Operation

### Visual wizard guidance ensures trouble-free entry of method settings

- Enter complicated method settings using the Method Wizard, which provides an overview of the entire process.
- Setting entry guidance, linked to online help, is available in each window.
- Easy-to-understand illustrations are used in the [Tension], [Specimen], and [Data Processing] windows, greatly simplifying the entry of settings.



Displays illustrations for each specimen shape. A single glance shows which dimensions should be entered.

In addition to manual input, dimensions can be set via [Excel batch reading] or [Automatic input via calipers].

Enter additional, non-dimensional information for each specimen.

Prepare data processing items in advance. Simply press buttons on the figure to select settings.

Illustrations change according to the test mode and specimen material.

Create random calculation formula using a data processing item or specimen size.

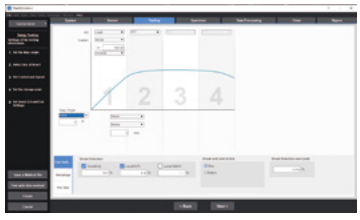
An example of selected plastic (Beside this, rubber and metal are available.)

## Choose from Five Software Components to Fit Your Specific Application

When multiple software components are purchased, easily switch between modes at a single touch, without starting up separate software.

### Single Software

Performs general single-direction testing. Examples include tensile, compression, bending and peeling tests.



### Cycle Software

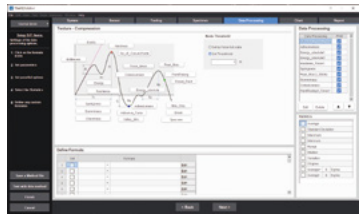
Similar to endurance testing, this software is used for testing where force is repeatedly applied and then released.

### Control Software

Creates any testing machine operation pattern. Perform foam rubber compression and holding cycle tests.

### Texture Software

Measures the features (texture) of foods and pharmaceuticals. Produce special data processing results, including mastication, jelly strength and adhesion.



### Spring Software

Enables the testing of springs. Both the characteristic values specific to springs and the spring height and length can be measured.

# Accessories

## Experience the range of possibilities available with this full-featured system


AGS-300kNX2
+ 300kN Non-Shift Wedge Type Grips

### Grips

Used to grip the sample, a wide variety is available to accommodate different specimen types and test force amounts.

Non-Shift Wedge Type Grips <MWG>

Plastics Metals Lumber

| Grip capacity | Standard grip face | | | | Upper grip weight (kg) |
|---|---|---|---|---|---|
| | Grip face | Clearance (mm) | Grip width (mm) | Grip length (mm) | |
| 300 kN | File teeth for flat specimens | 0 to 8.5 | 50 | 75 | 33 |
| 250 kN | | 0 to 8.5 | 50 | 75 | 33 |
| 100 kN | | 0 to 7 | 40 | 55 | 10 |
| 50 kN | | 0 to 7 | 40 | 55 | 9.5 |
| 20 kN | | 0 to 7 | 25 | 55 | 3.6 |

Non-Shift Wedge Type Grips

Pneumatic Flat Grips <PFG>

Plastics Rubber Textiles Cloth Paper Film

| Grip capacity | External dimensions (mm) | | Grip width (mm) | Clearance (mm) | Upper grip weight (kg) |
|---|---|---|---|---|---|
| | W | L (upper/lower) | | | |
| 10 kN | 154 | 268.5 / 278.5 | 60 | 0 to 10 | — |
| 5 kN | 154 | 224 / 235 | 60 | 0 to 6 | 5.7 |
| 1 kN | 102 | 163 / 174 | 50 | 0 to 6 | 1.7 |
| 50 N | 64 | 118 / 135 | 35 | 0 to 6 | 0.4 |

* Grips with foot-valve units and crosshead-linked control functions are also available.
* Grips can be opened and closed via the Smart Controller when using the crosshead-linked control kit.

Pneumatic Flat Grips

## Compression plate

Plastics Metals Rubber Lumber Cement

Used to compress the specimen, several type are available to accommodate different specimens and test force amounts.

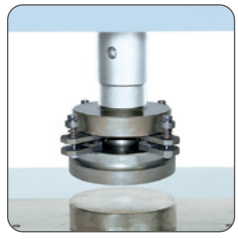
### Fixed Type

| Maximum capacity | Upper plate dimensions (mm) diameter by thickness | Upper plate mass (kg) | Operational temperature (°C) |
|---|---|---|---|
| 250 kN | ø100 × 25 | 1.6 | 0 to 40 |
| | ø50 × 25 | 0.5 | |
| | ø200 × 40 | 6.3 | |

### Spherical Seat Type

| Maximum capacity | Upper plate dimensions (mm) | Upper plate mass (kg) | Operational temperature (°C) |
|---|---|---|---|
| 250 kN | ø100 | 3.8 | 0 to 40 |

Fixed-Type Compression Plates



Spherical Seat-Type Compression Plates

* With spherical compression plates, only the upper plate is spherical. Spherical seat-type compression plates provide contact flexibility for uniform load application.
* Select the kit number that corresponds to the load cell used.

## Bending tests

Plastics

Simply attach the bending test jig kit to the main unit to perform bending testing.

| Max. test force | Punch tip radius × width (mm) | Support tip radius × width (mm) | Support spacing (mm) | Operational temperature (°C) | Applicable test standards |
|---|---|---|---|---|---|
| 10 kN | R5 × 34 | R2 × 34 | 20 to 200 | 0 to 40 | JIS K6911, JIS K6902*1, JIS C6481*2, JIS K7171, ISO 178, Specimens with thickness of 3 mm or less |
| | | R5 × 34 | | | JIS K7171, ISO 178, Specimens with thickness above 3 mm |
| | R1/8″ × 72 | R1/8″ × 110 | 0.8 to 8″ | | ASTM D790 (Test method 1) |
| 100 kN | R5 × 72 | R2 × 110 | 50 to 500 | | JIS K6911, JIS K6902*1, JIS C6481*2, JIS K7171, ISO 178, Specimens with thickness of 3 mm or less |
| | | R5 × 110 | | | JIS K7171, ISO 178, Specimens with thickness above 3 mm |
| | R1/8″ × 72 | R1/8″ × 110 | 2 to 20″ | | ASTM D790 (Test method 1*3) |

*1 Corresponds to bending strength. Compatible with support spacing from 20 mm to 200 mm.
*2 Corresponds to bending strength.
*3 Compatible with support spacing from 2 inches to 20 inches.
Requires an adaptor when the SIE or SES extensometer is used.

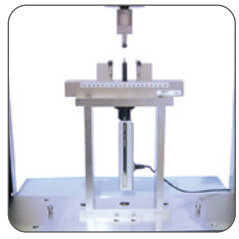
### Deflection Measuring Device for Three-point Bending Test

Plastics

Applicable to the ISO 178 three-point bending test, it is possible to use this device with plastic three-point bending jigs.

Applicable to ISO 178 Modulus measurement

Three-point Bending Test Jig for Plastics



Deflection Measuring Device with Three-point Bending Jig for Plastics

## Precise Measurement of Displacement

Class 0.5

Plastics Metal Metal Foil Rubber Film

### TRViewX Non-Contact Digital Video Extensometer

Conducts accurate gauge length elongation measurements on specimens, based on CCD camera images, over an extensive range.

| | Model | Camera Field-of-View (GL + elongation) |
|---|---|---|
| Single camera (TRViewX S Series) | TRViewX55S | 55 mm *1 |
| | TRViewX120S | 120 mm *1 |
| | TRViewX240S | 240 mm *1 |
| | TRViewX500S | 500 mm |
| | TRViewX800S | 800 mm |

| | Model | Camera Field-of-View (GL + elongation) |
|---|---|---|
| Double camera *2 (TRViewX D Series) | TRViewX500D | Camera 1: 120 mm *1<br>Camera 2: 500 mm |
| | TRViewX800D | Camera 1: 120 mm *1<br>Camera 2: 800 mm |

*1 Elongation accuracy at normal temperatures is ISO Class 0.5 compliant.
*2 With the double camera model, camera 1 takes measurements with a field of view up to 120 mm, beyond which the system switches to camera 2. Select models 500D/800D if you require a wide field of view (500 mm/800 mm) and Class 0.5 compliance up to a 120 mm field of view.

Class 0.5

Plastics Metal

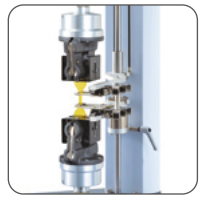
### SIE Series Automatic Extensometer

Automatic gauge position detection, gauge length setting, and arm clamping and unclamping of specimen.

Plastics Rubber

### DSES-1000 Extensometer for Soft Specimens

Easily and accurately measures large elongation amounts. 1000 mm Maximum Movement Distance, ±0.2% Relative Elongation Measurement Precision.



Class 0.5

Plastics Metal

### SSG-H Series Strain Gauge One-touch Extensometer

Lightweight, compact extensometer that can be attached or removed by a simple, one-touch operation.

* Requires external amplifier (option).

Class 1

Metal

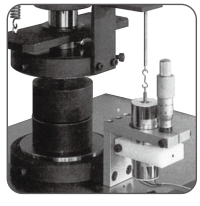
### DT Series Differential Transformer Type Extensometers

Applicable to the elongation measurement of metal.
Maximum diameter, thickness 45 mm
Compliant with Strain Rate Control Test Methods ISO 6892

Plastics Metal Rubber Lumber

### Compression Plate Displacement Measurement Device

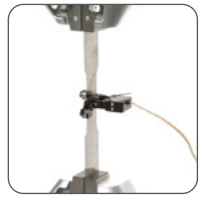
Measures displacement of compression plates during compression tests.



Plastics Metal Rubber

### Strain Gauge Type Width Sensor

Measures changes in specimen width.



## Testing in Controlled Environments

Temperature Range

**–70 °C to +300 °C**

### TCE Series Compact Thermostatic Chamber

Enables testing across a temperature range of –70 °C to +300 °C. +125 mm and +250 mm extension models are also avilable.

## Jigs for CFRP Testing Standards

CFRP

ASTM D6484 / D6484M

### Open-Hole Compression Strength Testing on Polymer Matrix Composite Laminate

ASTM D6484 is a typical method used to determine the compressive strength of CFRP open-hole samples.

ASTM D7137 / D7137M

### Testing the Compressive Residual Strength Characteristics of a Damaged Polymer Matrix Composite Plate

The testing is performed on rectangular samples made of composite materials that have already been subjected to impact testing. The sample is mounted on the jig and subjected to compression loads.


ASTM D5379 / D5379M

JIS K7079-2

### In-Plane Shear Testing Double-V-Notched Sample Shearing

The in-plane shear strength, in-plane shear fracture strain, and in-plane shear elastic modulus of carbon-fiber-reinforced plastics can be determined by the Iosipescu test, which is an in-plane shear test on double-V-notched samples.

ASTM D7078 / D7078M

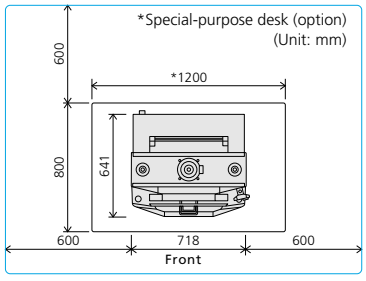
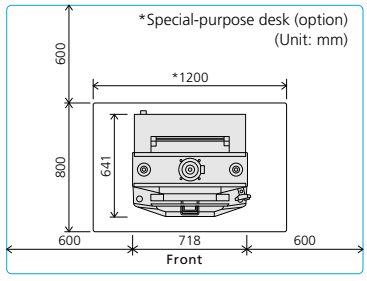
### V-Notched Rail Shear Testing and Evaluation of Composites

This testing applies shear forces to mounted samples with 90-degree V-notches at the top and bottom.

# AGS-X2 Series Specifications


AGS-20kNX2D


AGS-50kNX2D

| Model | | | Table-top Type | |
|---|---|---|---|---|
| | | | **AGS-20kNX2D** | **AGS-50kNX2D** |
| Max. Load Capacity | | | 20 kN | 50 kN |
| Force Measure-ment | Accuracy | High-Precision Type (1/500, ±0.5%) | Within ±0.5% indicated test force (at 1/500 to 1/1 load cell rating) | |
| | | | Conforms to EN 10002-2 Grade 0.5, ISO 7500-1 Class 0.5, BS 1610 Class 0.5, ASTM E4, and JIS B7721 Class 0.5. *1 | |
| | | Standard-Precision Type (1/500, ±1%) | Within ±1% indicated test force (at 1/500 to 1/1 load cell rating) | |
| | | | Conforms to EN 10002-2 Grade 1, ISO 7500-1 Class 1, BS 1610 Class 1, ASTM E4, and JIS B7721 Class 1. *1 | |
| | Calibration | | Automatic test force calibration: select tensile, compression, or tensile and compression | |
| Crosshead | | Speed Range | 0.001 to 2000 mm/min (stepless) | 0.0001 to 1000 mm/min (stepless) |
| | | Max. Return Speed | 2200 mm/min | 1100 mm/min |
| Crosshead Speed Accuracy *2 | | | ±0.1% | |
| Crosshead Speed and Permitted Test Force | | | To load cell capacity across entire speed range | |
| Crosshead – Table Distance (Tensile stroke) *3 | | | 1250 mm (765 mm, MWG) | 1210 mm (745 mm, MWG) |
| Effective Test Width | | | 425 mm | |
| Crosshead Position Detection | | Measurement Method | Optical encoder | |
| | | Display Method | Digital display (display resolution: 0.001 mm) | |
| | | Positional Accuracy | ±0.1% indicated value or ±0.01 mm, whichever is larger | |
| Data Capture Rate | | | 1000 Hz max. *4 | |
| Test Method Files | | | 40 files (PC link: 20 files, standalone controller: 20 files) | |
| Standard Functions | | | • Automatic reading of load cell characteristic values<br>• Test force display, stress display, stroke display, position display<br>• External analog output (2 channels)<br>• External analog input (2 channels) *4<br>• External digital input (2 channels) *4<br>• Analog recorder (option) output<br>• Dataletty (option) output *5 | • Automatic test force / stress control (Autotuning)<br>• Automatic strain control (Autotuning) *4<br>• Test force auto-zeroing<br>• Test force auto-calibration<br>• Break detection, auto-return<br>• Load cell overload detection<br>• Touch-load detection function |
| Accessories | | | Load Cell (with CAL cable), Power cable (5 m), turning rod, cable clamps, instruction manual | |
| Dimensions | | |  <br>W718 × D641 × H1633 mm |  <br>W718 × D641 × H1633 mm |
| Weight | | | 235 kg | 260 kg |
| Power Requirements | | | Single phase AC 200–230 50/60 Hz 4.0 kVA | |
| | | | Supply voltage fluctuations within ±10% of the set value.<br>D-class (100 Ω max.) grounding resistance. | |
| Operating Environment | | | Temperature: 5 °C to 40 °C; Humidity: 20% to 80% (no condensation)<br>Floor vibrations: frequency 10 Hz max., amplitude 5 µm max. | |

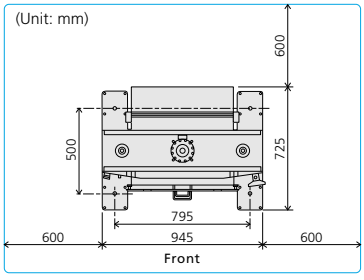
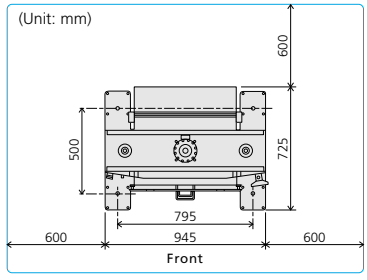
*1 Official certification after installation is recommended to comply with EN 10002-2, ISO 7500-1, ASTM E4 standards, and JIS B7721.

*2 Crosshead speed accuracy is calculated from the crosshead travel within a prescribed time at a constant speed between 0.5 mm/minute and 500 mm/minute.

*3 The tensile stroke is the effective stroke when SCG (screw-type flat grips) or MWG (non-shift wedge-type grips) are mounted.

AGS-100kNX2

AGS-300kNX2

| Floor Type | |
|---|---|
| **AGS-100kNX2** | **AGS-300kNX2** |
| 100 kN | 300 kN |
| Within ±0.5% indicated test force (at 1/500 to 1/1 load cell rating) | Within ±0.5% indicated test force(at 1/250 to 1/1 load cell rating) |
| Conforms to EN 10002-2 Grade 0.5, ISO 7500-1 Class 0.5, BS 1610 Class 0.5, ASTM E4, and JIS B7721 Class 0.5. *1 | |
| Within ±1% indicated test force (at 1/500 to 1/1 load cell rating) | |
| Conforms to EN 10002-2 Grade 1, ISO 7500-1 Class 1, BS 1610 Class 1, ASTM E4, and JIS B7721 Class 1. *1 | |
| Automatic test force calibration: select tensile, compression, or tensile and compression | |
| 0.0001 to 1000 mm/min (stepless) | 0.0001 to 500 mm/min (stepless) |
| 1100 mm/min | 550 mm/min |
| ±0.1% | |
| To load cell capacity across entire speed range | 0.001–200 kN: 0.001–500 mm/min (entire speed range)<br>200–300 kN: 0.001–400 mm/min |
| 1255 mm (745 mm, MWG) | 1475 mm (635 mm, MWG) |
| 600 mm | |
| Optical encoder | |
| Digital display (display resolution: 0.001 mm) | |
| ±0.1% indicated value or ±0.01 mm, whichever is larger | |
| 1000 Hz max. *4 | |
| 40 files (PC link: 20 files, standalone controller: 20 files) | |
| • Automatic reading of load cell characteristic values<br>• Test force display, stress display, stroke display, position display<br>• External analog output (2 channels)<br>• External analog input (2 channels) *4<br>• External digital input (2 channels) *4<br>• Analog recorder (option) output<br>• Dataletty (option) output *5 | • Automatic test force / stress control (Autotuning)<br>• Automatic strain control (Autotuning) *4<br>• Test force auto-zeroing<br>• Test force auto-calibration<br>• Break detection, auto-return<br>• Load cell overload detection<br>• Touch-load detection function |
| Load Cell (with CAL cable), Power cable (5 m), turning rod, cable clamps, instruction manual | |
|  |  |
| W945 × D725 × H2164 mm | W945 × D725 × H2414 mm |
| 525 kg | 675 kg |
| 400 V model: Three phases AC 380–440 V 50/60 Hz 4.5 kVA<br>200 V model: Three phases AC 200–230 V 50/60 Hz 6.5 kVA | 400 V model: Three phases AC 380–440 V 50/60 Hz 5.5 kVA<br>200 V model: Three phases AC 200–230 V 50/60 Hz 7.5 kVA |
| Supply voltage fluctuations within ±10% of the set value.<br>400 V model: C-class (10 Ω max.) grounding resistance.<br>200 V model: D-class (100 Ω max.) grounding resistance. | |
| Temperature: 5 °C to 40 °C; Humidity: 20% to 80% (no condensation)<br>Floor vibrations: frequency 10 Hz max., amplitude 5 μm max. | |

*4 TRAPEZIUM X-V or TRAPEZIUM LITE X is needed for these functions. Moreover, when automatic test force/stress control (auto tuning) and the automatic strain control (auto tuning) are used, the sampling speed becomes 10 msec.

*5 Dataletty (option) and TRAPEZIUM X-V / TRAPEZIUM LITE X can not be used together.

# Options

## Optional Frames for AGS-X2 Series

Extended Column Options For testing with a longer test stroke.

| Capacity | 10 kN | 20 kN | 50 kN | 100 kN | 250 kN/300 kN |
|---|---|---|---|---|---|
| Reinforced Yoke Specification | ✓ | – | – | – | – |
| +250 mm Extended Column | ✓ | – | – | ✓ | – |
| +500 mm Extended Column | ✓ | ✓ | ✓ | – | – |

## Options for AGS-10kNX Frame

### Jog Controller

The jog dial allows manual positioning of the crosshead.

### Power Cable

EU specification (VDE standard)
Chinese specification (GB standard)
Japanese, N. American specification (UL, CSA, PSE standards)
supplied as standard.

## Options for AGS-X2 Series

### Control I/O Box

Expands the number of control I/O ports to four. Multiple options can be simultaneously connected to the control I/O ports.

### Sensor I/O Box

Expands the number of sensor I/O ports to two. Multiple options can be simultaneously connected to the sensor I/O ports. BNC cables can be connected to the analog I/O ports (2 ports each).

Other options are also available. For details, refer to the separate catalog (Shimadzu AUTOGRAPH Optional Accessories).

# Testing and Evaluation Machines

**AGX-V2 series**
Precision Universal Tester

**EZ Test**
Small Table-Top Tester

**UH-X/FX series**
Universal Testing Machines

**HMV-G series**
Micro Hardness Tester

**DUH-211 series**
Dynamic Ultra Micro Hardness Tester

**Servopulser EMT series**
Electromagnetic Force Fatigue/Endurance Testing System

**Testing Machine Configurator**
https://www.shimadzu.com/an/test/tmc/

You can create your own customized testing system. ▶

▲ Scan here for more information



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