

Material Testing Equipment



Instrumentation & Technologies



Universal Testing Machine

AIM 651DG-300, AIM 652DG-600, AIM 653DG-1000, AIM 653DG-1200,
AIM 653DG-1500 & AIM 653DG-2000



AIM 653DG-1000

Ref. Standard: IS 1608, (Part I), IS 1786, ASTM -A370, ASTM-E8/E8M, IS 1828 (Part I), IS 1599

Salient Features

- Loading accuracy as high as $\pm 1\%$ of the indicating value
- 4/6 pillar structure with hydraulic jaw grips.
- Strain measurement at variable speed to cover a wide range of materials adjustable by the manual control valve.
- High reading accuracy and rugged design of digital display.
- Simple control to facilitate ease of operation.
- Robust load frame with extremely rigid construction.
- Large effective clearance between columns enable testing of standard specimen as well as structures.
- Motor driven threaded columns for UP/DOWN movement of lower crosshead for quick change over of specimen, grips and attachment.
- Wide range of standards and special accessories including load stabilizer (Optional).
- Clamping of jaws and specimen gap can also operate through remote control
- Fully open front hydraulic wedge grips make it easy to insert and remove specimens for increased productivity and operator safety.



Material Testing

Application

Aimil Universal Testing Machine is designed for testing metals under tension, compression, bending, transverse and shear load, both in the form of test pieces and as finished product (optional).

Principle of Operation

The load is applied by a hydrostatically lubricated ram. The cylinder in turns receives pressure from the power pack. The load is transmitted to the test specimen and is displayed by a separately housed load indicator.

Loading Units

It consists of a hydraulic cylinder & piston mounted on a robust base. The loading frame consists of an upper crosshead, middle crosshead and lower table. The upper cross-head and lower table are fitted on two/four hard chrome plated columns. The middle cross-head is fitted on two threaded columns. A reduction gear motor drives the chain and sprockets fixed at the bottom of the threaded columns for height adjustments. The cylinder and ram are individually lapped to eliminate friction. Axial loading of the system is ensured by provision of a ball seating under the lower table. An encoder is provided for measurement of deformation of various samples. Tensile test is conducted by gripping the test specimen between the upper and middle cross-heads. Compression, Transverse, Bending and Shear test are conducted between the middle crosshead and the lower table.

Hydraulic System

The power pack has a directly driven pump which generates a maximum pressure of 300 kgf/cm^2 . The hydraulic pump produces a continuous non-pulsating oil flow. Hence the load application is very smooth. A pressure compensated flow control valve is provided which controls oil flow to the main cylinder. This maintains a constant rate of piston movement and hence straining rate is kept constant. This valve is hand operated and gives infinitely variable oil flow to obtain different rates of straining.

Electronic Control Panel

This includes high precision, sealed in built electronic control panel and very accurate load cell or pressure transducer mounted in the loading unit. A stable data acquisition system converts the analog output of pressure transducer into equivalent digital figures.

The Load Cell/Pressure Transducer and Encoder are used to measure Mechanical Load, Liner Displacement respectively. The Digital Indicator Comprises of a regulated power supply, excitation source, calibration port, signal conditioner cards, display & keypad. The Digital panel is calibrated to display the load directly in kN, displacement in mm.

Accuracy and Calibration

Aimil Universal Testing Machines are controlled for precision and accuracy during every stage of manufacturing. The machines are calibrated in accordance with IS : 1828-1 2022. An accuracy of $\pm 1\%$ is guaranteed from 20% of the load range selected to full load.

Suitable for operation on 440V, 50Hz, three phase, AC supply.



Digital Universal Testing Machine Model Available: Capacity 300 kN, 600 kN, 1000 kN, 1200 kN, 1500 kN & 2000kN

Specifications						
MODEL NO	AIM 651DG-300	AIM 652DG-600	AIM 653DG-1000	AIM 653DG-1200	AIM 653DG-1500	AIM 653DG-2000
Machine capacity	300 kN	600 kN	1000 kN	1200 kN	1500 kN	2000 kN
Load Resolution	0.01 kN	0.01 kN	0.1 kN	0.1 kN	0.1 kN	0.1 kN
Elongation Scale Resolution	0.01mm	0.01mm	0.01mm	0.01mm	0.01mm	0.01mm
Extensometer Resolution	0.001mm	0.001mm	0.001mm	0.001mm	0.001mm	0.001mm
Control Type	Manual	Manual	Manual	Manual	Manual	Manual
Max Clearance for tensile test	600mm	700mm	800mm	850mm	850mm	900mm
Max Clearance for Compression test	540mm	650mm	750mm	800mm	800mm	850mm
Clearance between columns	375mm	455mm	540mm	700mm	850mm	850mm
Ram Stroke	200mm	200mm	200mm	250mm	250mm	300mm
Straining/piston speed at no load	0 - 115mm/min.	0 - 80mm/min.	0 - 70mm/min.	0 - 60mm/min.	0 - 60mm/min.	0 - 50mm/min.
For Tension Test Clamping jaws for round specimens	6 - 12mm 22 - 32mm	8 - 15mm 13 - 26mm 26 - 40mm	8 - 15mm 16 - 25mm 26 - 40mm	8 - 16mm 16 - 25mm 40 - 60mm	10 - 25mm 20 - 40mm 45 - 70mm	20 - 40mm 25 - 45mm 40 - 60mm 60 - 80mm
Clamping jaws for flat specimens thickness	0 - 20mm	0 - 30mm	0 - 40mm	0 - 22mm 22-44mm	0 - 22mm 22-44mm 44-70mm	0 - 20mm 20-45mm 45-70mm
Flat specimen width	70mm	90mm	110mm	70mm	100mm	90mm
For Compression Test: Pair of compression plates Dia of circular platen	200mm	200mm	200mm	200mm	200mm	220mm
Crosshead geared motor (kW)	0.74kW	0.55kW	0.74kW	0.74kW	1.1kW	1.5kW
Power pack motor (kW)	1.49kW	2.2kW	2.2kW	2.6kW	4.9kW	4.9kW
Weight (approx)	1700kg	2500kg	3500kg	5000kg	6000kg	9500kg



Material Testing

Software for UTM

Aimil recognizes that the most efficient way of testing is with the help of software and the ease of its operation. The Aimil UTM 1.1 has been ergonomically designed to suit the various needs of the customers as per their requirements and operation of the software is extremely user friendly and the features are self-explanatory.

Features

- Tensile Testing
- Compression Testing
- Transverse Test for flat sample
- Bend & Rebend Test
- Shear Test
- Extensometer Test
- Flexure Test
- Rope Test

The bright, large and prominent display for the load and displacement adds to the readability of the software and hence effortless observation of the online tests.

The enhanced display of the test screen displays the value of the load and displacement and the online graphs as it is generated during the tests. The selection of the scale on graph enables you to view the graph more prominently on the screen. The extensometer test screen incorporates the results of the normal Load Vs Displacement. Test as well as the Load Vs Extension and Stress Vs Strain online graphical view simultaneously, a unique facility on its own.

Software Capability

- Database backup & restore facilities are available
- Customizable report – header / footer
- The default report generated automatically in crystal reports & can be printed directly. The reports can also be exported to excel
- User can set starting point of graph line
- User can set failure detection percentage
- Automatic change over graph scale
- Display of Load Vs Displacement & Stress Vs Strain graph in real time
- Printout of Load Vs Displacement, Stress Vs Strain graph & test results
- User can analyze the report from test data & also define 0.1% & 0.2% proof stress line
- Overload feature which stops the machine when the maximum define load is reached

Statistical Analysis:

This powerful tool enables the user to compare and study the results in a statistical format.

Most useful in places where the Batch Reports are studied for the production.

This extraordinary feature has been designed keeping in mind the ever changing needs of the industry to achieve higher standards.

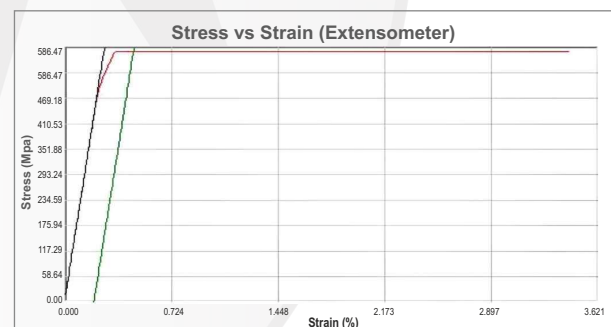
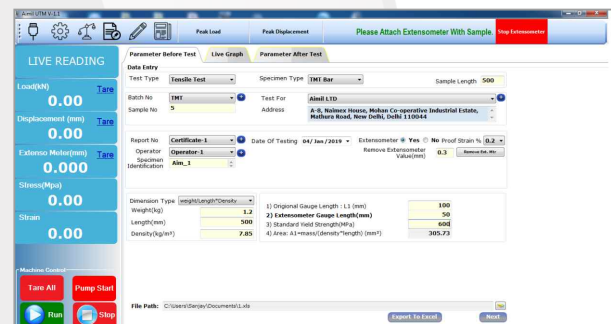
This flexibility can be achieved with the Aimil Software with an assurance of lifetime quality service and updates as per the latest industry standards.

The test data can be analysed for following graphical presentations :

- I Mean Deviation
- II Frequency Distribution
- III Skew Diagram
- IV Histogram

- **Security Manager** : This helps the user to protect and save the test data of all the previous tests with help of Password Protection feature.

- **Additional Feature** include the facility to incorporate the users Company Logo on the Test Report and can provide wide variety of customization of the software features as per the needs of the customer.





Minimum Recommended Computer Hardware

- 2 GHz Pentium Dual Core or equivalent
- 4 GB RAM, although using multiple testing machines may require additional memory and/or a faster processor
- 256 MB DirectX 9.0 capable video card
- 250GB HD Drive
- CD-ROM Drive
- Mouse or pointing device and keyboard supported by Windows
- Monitor that supports at least 1024 x 768 resolution and 32-bit color
- 2 USB Serial Port adapter per machine
- Windows compatible printer recommended for reporting capabilities
- Windows compatible sound card and speakers (for audio playback)
- Additional USB ports for measuring devices, barcode scanners, printer etc.
- At least 1 integrated serial port (not USB) where possible

Software Requirements

- The Aimil Software's are designed for 32-bit & 64-bit operating systems running Windows 7, Windows 8, Window 10 and above. It does Not support Windows XP and below.
- Internet Explorer 8 or higher.

Note: A 64-bit operating system is preferred for best Performance

Ordering Information :

AIM 651DG-300	Digital Universal Testing Machine, 300kN Capacity, 6-Pillar Type with Hydraulic Grips
AIM 652DG-600	Digital Universal Testing Machine, 600kN Capacity, 6-Pillar Type with Hydraulic Grips
AIM 653DG-1000	Digital Universal Testing Machine, 1000kN Capacity, 6-Pillar Type with Hydraulic Grips
AIM 653DG-1200	Digital Universal Testing Machine, 1200kN Capacity, 6-Pillar Type with Hydraulic Grips
AIM 653DG-1500	Digital Universal Testing Machine, 1500kN Capacity, 6-Pillar Type with Hydraulic Grips
AIM 653DG-2000	Digital Universal Testing Machine, 2000kN Capacity, 6-Pillar Type with Hydraulic Grips

Optional Accessories for all capacities

- AIM-65106** Transverse test set (roller width - 160mm, Dia - 50mm, clearance between supports - 600mm)
- AIM-65109** Electronic extensometer strain gauge type with 2.5mm extension and gauge length 25 & 50mm
- AIM-65110** Brinell test attachment for 400kN UTM
- AIM-65210** Brinell test attachment for 600kN UTM
- AIM-65318** Brinell test attachment for 1000kN UTM
- AIM-65111** Bend test attachment 180°
- AIM-65112** Flexural test attachment
- AIM-65113** Shear test attachment for 6, 8, 12, 16 & 20mm dia samples
- AIM-65114** Shear test attachment for 25, 30, 35 & 40 mm dia samples
- AIM-65115** Pair of threaded holding heads 8, 10, 12, 14, 16, 18, 20, 22, 24, 27mm (per set)
- AIM-65116** Gripping device for threaded & shouldered specimens
- AIM-65117** Pair of split ring for shouldered specimen 8, 10, 12, 14, 16, 18, 20, 22, 24, 27mm (per set)

Note: 1 UTM is supplied with Aimil Software. Computer will be supplied at an extra cost.

Note: 2 Modifications in optional accessories can be made on request.

Note: 3 NABL Accredited Calibration Certificate for force parameter will be supplied along with machine.



Digital Universal Testing Machine for Strand Wire

AIM 655DG-600 & AIM 655DG-1000

(Similar to AIM 652DG-600 & AIM 653DG-1000 except loading unit)

Specifications		
MODEL NO	AIM 655DG-600	AIM 655DG-1000
Capacity	600kN	1000kN
Machine Type	6 Pillar with Hydraulic Grips	6 Pillar with Hydraulic Grips
Load Resolution	0.01 kN	0.01 kN
Displacement Resolution of Piston	0.1 mm	0.1mm
Displacement Resolution Extensometer	0.001mm	0.001mm
Max Clearance for tensile test	1000mm	1000mm
Max Clearance for Compression test	900mm	900mm
Clearance between columns	375mm	455mm
Piston Stroke	200mm	200mm
Straining/piston speed	120mm/min	100mm/min
Middle beam lifting speed	320 mm/min	320 mm/min
For Tension Test		
Clamping jaws for round specimens	14-32- & 32-40mm diameter	14-32- & 32-40mm diameter
For Flat Test		
Clamping jaws for flat specimen's	0-20 mm	0-40 mm
Strand Wire Jaws	6-12 mm & 12-18 mm diameter	6-12 mm & 12-18 mm diameter
For Compression Test: Pair of compression plates Dia of circular platen	220mm	233mm
The maximum distance between the bending test	300mm	300mm
Total Power	2.2KW	2.2KW
Power supply	440V, 50Hz, Three Phase, AC supply.	440V, 50Hz, Three Phase, AC supply.

Ordering Information :

AIM 655DG-600 Digital Universal Testing Machine for Strand Wire, 600kN Capacity, 6-Pillar Type with Hydraulic Grips

AIM 655DG-1000 Digital Universal Testing Machine for Strand Wire, 1000kN Capacity, 6-Pillar Type with Hydraulic Grips

Note: 1 UTM is supplied with Aimil Software. Computer will be supplied at an extra cost.

Note: 2 Modifications in optional accessories can be made on request.

Note: 3 NABL Accredited Calibration Certificate for force parameter will be supplied along with machine.



Semi-Automatic Universal Testing Machine (Load and Displacement Controlled)

**AIM 651SMCS-300, AIM 652SMCS-600, AIM 653SMCS-1000,
AIM 653SMCS-1200, AIM 653SMCS-1500 & AIM 653SMCS-2000**

Ref. Standard: IS 1608, (Part I), IS 1786, ASTM -A370,
ASTM-E8/E8M, IS 1828 (Part I), IS 1599

The Semi-Automatic Universal Testing Machine (UTM) is an advanced material testing system designed for high accuracy, repeatability, and compliance with international standards. This machine utilizes a servo motor-driven control mechanism, ensuring smooth and precise load and displacement application during testing.

The system is semi-automatic and controlled via an intelligent Pace Rate Controller, which operates in a closed-loop feedback system for real-time monitoring of load and displacement. It is equipped with a manual load release valve, allowing the operator to manually release the load after test completion.

Modes of Operation:

- **Load Control Mode:** Maintains a specified load rate until material failure.
- **Displacement Control Mode:** Applies a constant displacement rate for detailed deformation analysis.
- **Automatic Transition Mode:** Starts in Load Control Mode and automatically switches to Displacement Control Mode upon reaching the yield point.
- **Manual Mode Switching:** Allows the operator to switch between load and displacement control modes at any stage of testing.

Applications

The UTM is designed for a wide range of material testing applications across different industries, including:

- **Tensile Testing:** Determines material tensile strength and elongation.
- **Compression Testing:** Analyzes material resistance to compressive forces.
- **Bending Testing:** Evaluates material flexibility and strength under bending stress.
- **Shear Testing:** Measures a material's shear strength and failure resistance.

This machine is ideal for quality control, research applications, and compliance testing in various industries such as construction, automotive, aerospace, metallurgy, and material science.

Components and General Details

Load Frame

The load frame is built for high rigidity, stability, and minimal deformation under load. It features:

- **6-Pillar Structure:** Provides excellent stability and minimizes deflection.
- **Axial Load Application:** Uniform force distribution through ball seating.
- **Integrated High-Resolution Displacement Sensor:** Captures deformation data in real-time.
- **Adjustable Middle Crosshead:** Allows flexible test space for different specimen sizes.
- **Motorized Threaded Columns:** Enables quick UP/DOWN movement of the lower crosshead for specimen and grip adjustments.
- **Large Clearance between Columns:** Facilitates testing of standard specimens and
- **Automatic Hydraulic Gripping System:** Remote-controlled opening/closing of grips for convenience.



AIM 653SMCS-1000



Material Testing

Pumping Unit

A servo motor controlled hydraulic system that provides consistent force during testing. It includes:

- High-Efficiency Hydraulic System: Ensures precise force application.
- Low Noise & Minimal Heat Generation: Designed for energy-efficient performance.
- Constant Pressure & Flow Control: Maintains uniform conditions during prolonged tests.
- Manual Load Release Valve: Equipped with a manual valve allowing the operator to release the applied load after test completion.

Digital Indicator cum Controller

The digital controller provides real-time load and displacement feedback with multiple control features:

- Multi-Mode Operation: Load Control, Displacement Control, Automatic Transition Mode, and Manual Switching.
- Closed-Loop PID Feedback System: Ensures precise and stable adjustments.
- PC Integration: Facilitates seamless data visualization and operation.
- Overload Protection: Stops the test automatically if predefined limits are exceeded.

UTM Software (Windows-Based)

Aimil recognizes that the most efficient way of testing is with the help of software and the ease of its operation. The Aimil UTM 1.1 has been ergonomically designed to suit the various needs of the customers as per their requirements and operation of the software is extremely user friendly and the features are self-explanatory. The advanced software suite is designed for real-time control, data acquisition, and analysis.

Features

- Tensile Testing
- Compression Testing
- Transverse Test for flat sample
- Bend & Rebend Test
- Shear Test
- Extensometer Test
- Flexure Test
- Rope Test

The bright, large and prominent display for the load and displacement adds to the readability of the software and hence effortless observation of the online tests.

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Software Capability

- Operation Mode Control - Software-based control of load control, displacement control, auto transition mode, and manual switching - all selectable directly from the interface.
- Control parameter - load/displacement
- Database backup & restore facilities are available
- Customizable report – header / footer
- The default report generated automatically in crystal reports & can be printed directly. The reports can also be exported to excel
- User can set starting point of graph line
- User can set failure detection percentage
- Automatic change over graph scale
- Display of Load Vs Displacement & Stress Vs Strain graph in real time
- Printout of Load Vs Displacement, Stress Vs Strain graph & test results
- User can analyze the report from test data & also define 0.1% & 0.2% proof stress line
- Overload feature which stops the machine when the maximum define load is reached
- Automated Test Execution & Report Generation

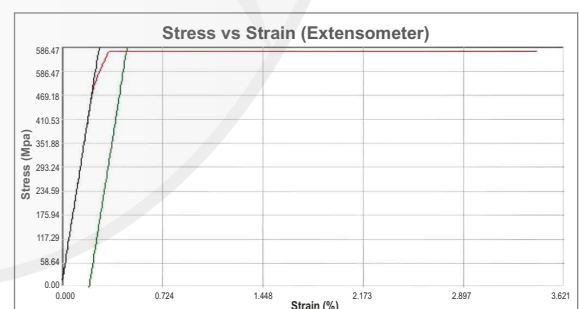
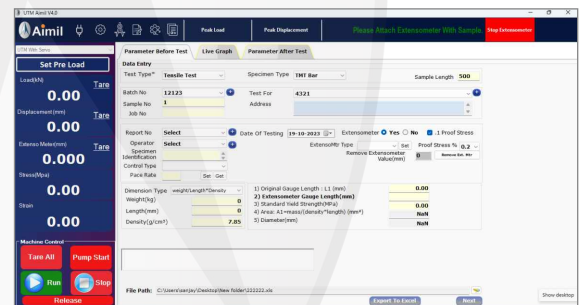
Statistical Analysis:

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Minimum Recommended Computer Hardware

- 2 GHz Pentium Dual Core or equivalent
- 4 GB RAM, although using multiple testing machines may require additional memory and/or a faster processor
- 256 MB DirectX 9.0 capable video card
- 250GB HD Drive
- CD-ROM Drive
- Mouse or pointing device and keyboard supported by Windows
- Monitor that supports at least 1024 x 768 resolution and 32-bit color
- 2 USB Serial Port adapter per machine
- Windows compatible printer recommended for reporting capabilities
- Windows compatible sound card and speakers (for audio playback)
- Additional USB ports for measuring devices, barcode scanners, printer etc.
- At least 1 integrated serial port (not USB) where possible

Software Requirements

- The Aimil Software's are designed for 32-bit & 64-bit operating systems running Windows 7, Windows 8, Windows 10 and above. It does Not support Windows XP and below.
- Internet Explorer 8 or higher.

Note: A 64-bit operating system is preferred for best Performance

Ordering Information :

AIM 651SMCS-300	Semi-Automatic Universal Testing Machine, 300 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled
AIM 652SMCS-600	Semi-Automatic Universal Testing Machine, 600 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled
AIM 653SMCS-1000	Semi-Automatic Universal Testing Machine, 1000 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled
AIM 653SMCS-1200	Semi-Automatic Universal Testing Machine, 1200 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled
AIM 653SMCS-1500	Semi-Automatic Universal Testing Machine, 1500 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled
AIM 653SMCS-2000	Semi-Automatic Universal Testing Machine, 2000 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled

Optional Accessories for all capacities

- AIM-65106** Transverse test set (roller width - 160mm, Dia - 50mm, clearance between supports - 600mm)
- AIM-65109** Electronic extensometer strain gauge type with 2.5mm extension and gauge length 25 & 50mm
- AIM-65110** Brinell test attachment for 400kN UTM
- AIM-65210** Brinell test attachment for 600kN UTM
- AIM-65318** Brinell test attachment for 1000kN UTM
- AIM-65111** Bend test attachment 180°
- AIM-65112** Flexural test attachment
- AIM-65113** Shear test attachment for 6, 8, 12, 16 & 20mm dia samples
- AIM-65114** Shear test attachment for 25, 30, 35 & 40 mm dia samples
- AIM-65115** Pair of threaded holding heads 8, 10, 12, 14, 16, 18, 20, 22, 24, 27mm (per set)
- AIM-65116** Gripping device for threaded & shouldered specimens
- AIM-65117** Pair of split ring for shouldered specimen 8, 10, 12, 14, 16, 18, 20, 22, 24, 27mm (per set)

Note: 1 UTM is supplied with Aimil Software. Computer will be supplied at an extra cost.

Note: 2 Modifications in optional accessories can be made on request.

Note: 3 NABL Accredited Calibration Certificate for force parameter will be supplied along with machine.



Material Testing

Semi-Automatic Universal Testing Machine Model Available: Capacity 300 kN, 600 kN, 1000 kN, 1200 kN, 1500 kN & 2000kN

Specifications						
MODEL NO	AIM 651SMCS-300	AIM 652SMCS-600	AIM 653SMCS-1000	AIM 653SMCS-1200	AIM 653SMCS-1500	AIM 653SMCS-2000
Machine capacity	300 kN	600 kN	1000 kN	1200 kN	1500 kN	2000 kN
Accuracy	±1 %	±1 %	±1 %	±1 %	±1 %	±1 %
Load Resolution	0.01 kN	0.01 kN	0.1 kN	0.1 kN	0.1 kN	0.1 kN
Elongation Scale Resolution	0.01mm	0.01mm	0.01mm	0.01mm	0.01mm	0.01mm
Extensometer Resolution	0.001mm	0.001mm	0.001mm	0.001mm	0.001mm	0.001m
Control Type	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic
Control Parameter	Load/Displacement	Load/Displacement	Load/Displacement	Load/Displacement	Load/Displacement	Load/Displacement
Load Control Range	0.2 to 5 kN / sec	0.5 to 10 kN / sec	0.5 to 12 kN / sec	0.5 to 15 kN / sec	0.8 to 18 kN / sec	1 to 20 kN / sec
Displacement Control Range	0.001 to 10 mm/sec	0.001 to 10 mm/sec	0.001 to 10 mm/sec	0.001 to 10 mm/sec	0.001 to 10 mm/sec	0.001 to 10 mm/sec
Load Release Type	Manual	Manual	Manual	Manual	Manual	Manual
Max Clearance for tensile test	600mm	700mm	800mm	850mm	850mm	900mm
Max Clearance for Compression test	540mm	650mm	750mm	800mm	800mm	850mm
Clearance between columns	375mm	455mm	540mm	700mm	850mm	850mm
Ram Stroke	200mm	200mm	200mm	250mm	250mm	300mm
For Tension Test						
Clamping jaws for round specimens	6 - 12mm 12 - 22mm 22 - 32mm	8 - 15mm 13 - 26mm 26 - 40mm	8 - 15mm 16 - 25mm 26 - 40mm	8 - 16mm 16 - 25mm 40 - 60mm	10 - 25mm 20 - 40mm 45 - 70mm	20 - 40mm 25 - 45mm 60 - 80mm
Clamping jaws for flat specimens thickness	0 - 20mm	0 - 30mm	0 - 40mm	0 - 22mm 22-44mm	0 - 22mm 22-44mm 44-70mm	0 - 20mm 20-45mm 45-70mm
Flat specimen width	70mm	90mm	110mm	70mm	100mm	90mm
For Compression Test:						
Pair of compression plates	200mm	200mm	200mm	200mm	200mm	220mm
Dia of circular platen						
Crosshead geared motor (kW)	0.74kW	0.55kW	0.74kW	0.74kW	1.1kW	1.5kW
Power pack motor (kW)	0.75kW	1.5kW	1.5kW	1.5kW	1.5kW	1.5kW
Weight (approx)	1700kg	2500kg	3500kg	5000kg	6000kg	9500kg



Semi-Automatic Universal Testing Machine for Strand Wire (Load and Displacement Controlled)

AIM 655SMCS-600 & AIM 655SMCS-1000

(Similar to AIM 652SMCS-600 & AIM 653SMCS-1000 except loading unit)

Specifications		
MODEL NO	AIM 655SMCS-600	AIM 655SMCS-1000
Capacity	600kN	1000kN
Machine Type	6 Pillar with Hydraulic Grips	6 Pillar with Hydraulic Grips
Load Resolution	0.01 kN	0.01 kN
Displacement Resolution of Piston	0.1 mm	0.1mm
Extensometer Resolution	0.001mm	0.001mm
Control Type	Automatic	Automatic
Control Parameter	Load/Displacement	Load/Displacement
Load Control Range	0.5 to 10 kN /sec	0.5 to 12 kN /sec
Displacement Control Range	0.001 to 10 mm/ sec	0.001 to 10 mm/ sec
Load Release Type	Manual	Manual
Max Clearance for tensile test	1000mm	1000mm
Max Clearance for Compression test	900mm	900mm
Clearance between columns	375mm	455mm
Piston Stroke	200mm	200mm
Middle beam lifting speed	320 mm/min	320 mm/min
For Tension Test		
Clamping jaws for round specimens	14-32- & 32-40mm diameter	14-32- & 32-40mm diameter
For Flat Test		
Clamping jaws for flat specimen's	0-20 mm	0-40 mm
Strand Wire Jaws	6-12 mm & 12-18 mm diameter	6-12 mm & 12-18 mm diameter
For Compression Test:		
Pair of compression plates	220mm	233mm
Dia of circular platen		
The maximum distance between the bending test	300mm	300mm
Total Power	1.5KW	1.5KW
Power supply	440V, 50Hz, Three Phase, AC supply.	440V, 50Hz, Three Phase, AC supply.

Ordering Information :

AIM 655SMCS-600	Semi-Automatic Universal Testing Machine for Stand Wire Testing, 600 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled
AIM 655SMCS-1000	Semi-Automatic Universal Testing Machine for Stand Wire Testing, 1000 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled

Note: 1 UTM is supplied with Aimil Software. Computer will be supplied at an extra cost.

Note: 2 Modifications in optional accessories can be made on request.

Note: 3 NABL Accredited Calibration Certificate for force parameter will be supplied along with machine.



Automatic Universal Testing Machine (Load and Displacement Controlled)

**AIM 651SMCA-300, AIM 652SMCA-600, AIM 653SMCA-1000,
AIM 653SMCA-1200, AIM 653SMCA-1500 & AIM 653SMCA-2000**

Ref. Standard: IS 1608, (Part I), IS 1786, ASTM -A370, ASTM-E8/E8M, IS 1828 (Part I), IS 1599

The Automatic Universal Testing Machine (UTM) is an advanced material testing system designed for high accuracy, repeatability, and compliance with international standards. This machine utilizes a servo motor-driven control mechanism, ensuring smooth and precise load and displacement application during testing.

The system is automatic and controlled via an intelligent Pace Rate Controller, which operates in a closed-loop feedback system for real-time monitoring of load and displacement. This model is fully automatic and features an auto load release system, which automatically releases the load upon test completion, eliminating the need for manual intervention and ensuring seamless operation.

Modes of Operation:

- **Load Control Mode:** Maintains a specified load rate until material failure.
- **Displacement Control Mode:** Applies a constant displacement rate for detailed deformation analysis.
- **Automatic Transition Mode:** Starts in Load Control Mode and automatically switches to Displacement Control Mode upon reaching the yield point.
- **Manual Mode Switching:** Allows the operator to switch between load and displacement control modes at any stage of testing.

Applications

The UTM is designed for a wide range of material testing applications across different industries, including:

- **Tensile Testing:** Determines material tensile strength and elongation.
- **Compression Testing:** Analyzes material resistance to compressive forces.
- **Bending Testing:** Evaluates material flexibility and strength under bending stress.
- **Shear Testing:** Measures a material's shear strength and failure resistance.

This machine is ideal for quality control, research applications, and compliance testing in various industries such as construction, automotive, aerospace, metallurgy, and material science.

Components and General Details

Load Frame

The load frame is built for high rigidity, stability, and minimal deformation under load. It features:

- **6-Pillar Structure:** Provides excellent stability and minimizes deflection.
- **Axial Load Application:** Uniform force distribution through ball seating.
- **Integrated High-Resolution Displacement Sensor:** Captures deformation data in real-time.
- **Adjustable Middle Crosshead:** Allows flexible test space for different specimen sizes.
- **Motorized Threaded Columns:** Enables quick UP/DOWN movement of the lower crosshead for specimen and grip adjustments.
- **Large Clearance between Columns:** Facilitates testing of standard specimens and
- **Automatic Hydraulic Gripping System:** Remote-controlled opening/closing of grips for convenience.



AIM 653SMCA-1000



Pumping Unit

A servo motor controlled hydraulic system that provides consistent force during testing. It includes:

- High-Efficiency Hydraulic System: Ensures precise force application.
- Low Noise & Minimal Heat Generation: Designed for energy-efficient performance.
- Constant Pressure & Flow Control: Maintains uniform conditions during prolonged tests.
- Automatic Load Release Mechanism: Automatically releases the applied load upon test completion, eliminating the need for manual intervention and enhancing testing efficiency and safety.

Digital Indicator cum Controller

The digital controller provides real-time load and displacement feedback with multiple control features:

- Multi-Mode Operation: Load Control, Displacement Control, Automatic Transition Mode, and Manual Switching.
- Closed-Loop PID Feedback System: Ensures precise and stable adjustments.
- PC Integration: Facilitates seamless data visualization and operation.
- Overload Protection: Stops the test automatically if predefined limits are exceeded.

UTM Software (Windows-Based)

Aimil recognizes that the most efficient way of testing is with the help of software and the ease of its operation. The Aimil UTM 1.1 has been ergonomically designed to suit the various needs of the customers as per their requirements and operation of the software is extremely user friendly and the features are self-explanatory. The advanced software suite is designed for real-time control, data acquisition, and analysis.

Features

- Tensile Testing
- Compression Testing
- Transverse Test for flat sample
- Bend & Rebend Test
- Shear Test
- Extensometer Test
- Flexure Test
- Rope Test

The bright, large and prominent display for the load and displacement adds to the readability of the software and hence effortless observation of the online tests.

The enhanced display of the test screen displays the value of the load and displacement and the online graphs as it is generated during the tests. The selection of the scale on graph enables you to view the graph more prominently on the screen. The extensometer test screen incorporates the results of the normal Load Vs Displacement. Test as well as the Load Vs Extension and Stress Vs Strain online graphical view simultaneously, a unique facility on its own.

Software Capability

- Operation Mode Control - Software-based control of load control, displacement control, auto transition mode, and manual switching - all selectable directly from the interface
- Automatic Test Execution - Complete testing process automation, including auto load release
- Control parameter - load/displacement
- Database backup & restore facilities are available
- Customizable report – header / footer
- The default report generated automatically in crystal reports & can be printed directly. The reports can also be exported to excel
- User can set starting point of graph line
- User can set failure detection percentage
- Automatic change over graph scale
- Display of Load Vs Displacement & Stress Vs Strain graph in real time
- Printout of Load Vs Displacement, Stress Vs Strain graph & test results
- User can analyze the report from test data & also define 0.1% & 0.2% proof stress line
- Overload feature which stops the machine when the maximum define load is reached

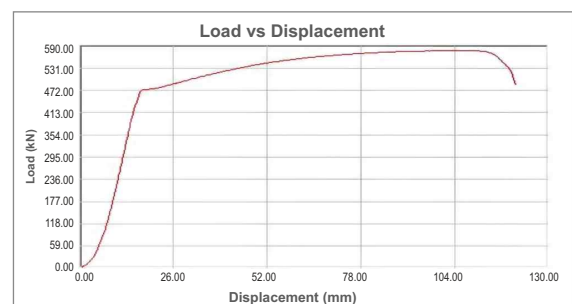
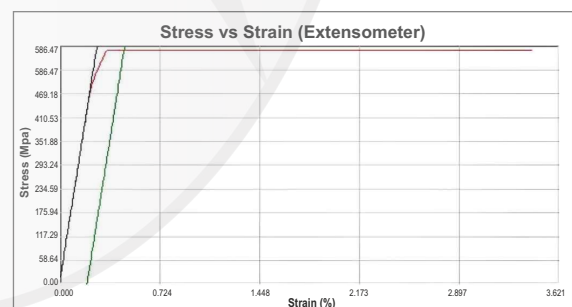
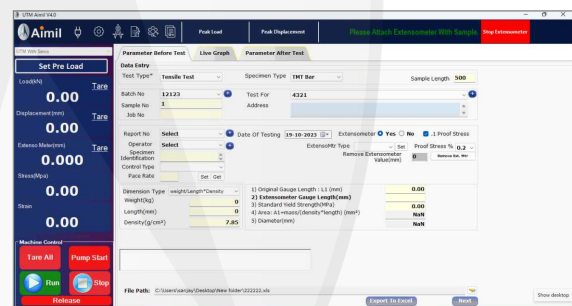
Statistical Analysis:

This powerful tool enables the user to compare and study the results in a statistical format.

Most useful in places where the Batch Reports are studied for the production.

This extraordinary feature has been designed keeping in mind the ever changing needs of the industry to achieve higher standards.

This flexibility can be achieved with the Aimil Software with an assurance of lifetime quality service and updates as per the latest industry standards.





Material Testing

Minimum Recommended Computer Hardware

- 2 GHz Pentium Dual Core or equivalent
- 4 GB RAM, although using multiple testing machines may require additional memory and/or a faster processor
- 256 MB DirectX 9.0 capable video card
- 250GB HD Drive
- CD-ROM Drive
- Mouse or pointing device and keyboard supported by Windows
- Monitor that supports at least 1024 x 768 resolution and 32-bit color
- 2 USB Serial Port adapter per machine
- Windows compatible printer recommended for reporting capabilities
- Windows compatible sound card and speakers (for audio playback)
- Additional USB ports for measuring devices, barcode scanners, printer etc.
- At least 1 integrated serial port (not USB) where possible

Software Requirements

- The Aimil Software's are designed for 32-bit & 64-bit operating systems running Windows 7, Windows 8, Window 10 and above. It does Not support Windows XP and below.
- Internet Explorer 8 or higher.

Note: A 64-bit operating system is preferred for best Performance

Ordering Information :

AIM 651SMCA-300	Automatic Universal Testing Machine, 300 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled
AIM 652SMCA-600	Automatic Universal Testing Machine, 600 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled
AIM 653SMCA-1000	Automatic Universal Testing Machine, 1000 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled
AIM 653SMCA-1200	Automatic Universal Testing Machine, 1200 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled
AIM 653SMCA-1500	Automatic Universal Testing Machine, 1500 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled
AIM 653SMCA-2000	Automatic Universal Testing Machine, 2000 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled

Optional Accessories for all capacities

- AIM-65106** Transverse test set (roller width - 160mm, Dia - 50mm, clearance between supports - 600mm)
- AIM-65109** Electronic extensometer strain gauge type with 2.5mm extension and gauge length 25 & 50mm
- AIM-65110** Brinell test attachment for 400kN UTM
- AIM-65210** Brinell test attachment for 600kN UTM
- AIM-65318** Brinell test attachment for 1000kN UTM
- AIM-65111** Bend test attachment 180°
- AIM-65112** Flexural test attachment
- AIM-65113** Shear test attachment for 6, 8, 12, 16 & 20mm dia samples
- AIM-65114** Shear test attachment for 25, 30, 35 & 40 mm dia samples
- AIM-65115** Pair of threaded holding heads 8, 10, 12, 14, 16, 18, 20, 22, 24, 27mm (per set)
- AIM-65116** Gripping device for threaded & shouldered specimens
- AIM-65117** Pair of split ring for shouldered specimen 8, 10, 12, 14, 16, 18, 20, 22, 24, 27mm (per set)

Note: 1 UTM is supplied with Aimil Software. Computer will be supplied at an extra cost.

Note: 2 Modifications in optional accessories can be made on request.

Note: 3 NABL Accredited Calibration Certificate for force parameter will be supplied along with machine.



Automatic Universal Testing Machine Model Available: Capacity 300 kN, 600 kN, 1000 kN, 1200 kN, 1500 kN & 2000kN

Specifications						
MODEL NO	AIM 651SMCA-300	AIM 652SMCA-600	AIM 653SMCA-1000	AIM 653SMCA-1200	AIM 653SMCA-1500	AIM 653SMCA-2000
Machine capacity	300 kN	600 kN	1000 kN	1200 kN	1500 kN	2000 kN
Accuracy	±1 %	±1 %	±1 %	±1 %	±1 %	±1 %
Load Resolution	0.01 kN	0.01 kN	0.1 kN	0.1 kN	0.1 kN	0.1 kN
Elongation Scale Resolution	0.01mm	0.01mm	0.01mm	0.01mm	0.01mm	0.01mm
Extensometer Resolution	0.001mm	0.001mm	0.001mm	0.001mm	0.001mm	0.001m
Control Type	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic
Control Parameter	Load/Displacement	Load/Displacement	Load/Displacement	Load/Displacement	Load/Displacement	Load/Displacement
Load Control Range	0.2 to 5 kN / sec	0.5 to 10 kN / sec	0.5 to 12 kN / sec	0.5 to 15 kN / sec	0.8 to 18 kN / sec	1 to 20 kN / sec
Displacement Control Range	0.001 to 10 mm/sec	0.001 to 10 mm/sec	0.001 to 10 mm/sec	0.001 to 10 mm/sec	0.001 to 10 mm/sec	0.001 to 10 mm/sec
Load Release Type	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic
Max Clearance for tensile test	600mm	700mm	800mm	850mm	850mm	900mm
Max Clearance for Compression test	540mm	650mm	750mm	800mm	800mm	850mm
Clearance between columns	375mm	455mm	540mm	700mm	850mm	850mm
Ram Stroke	200mm	200mm	200mm	250mm	250mm	300mm
For Tension Test						
Clamping jaws for round specimens	6 - 12mm 12 - 22mm 22 - 32mm	8 - 15mm 13 - 26mm 26 - 40mm	8 - 15mm 16 - 25mm 26 - 40mm	8 - 16mm 16 - 25mm 40 - 60mm	10 - 25mm 20 - 40mm 45 - 70mm	20 - 40mm 25 - 45mm 40 - 60mm 60 - 80mm
Clamping jaws for flat specimens thickness	0 - 20mm	0 - 30mm	0 - 40mm	0 - 22mm 22-44mm	0 - 22mm 22-44mm 44-70mm	0 - 20mm 20-45mm 45-70mm
Flat specimen width	70mm	90mm	110mm	70mm	100mm	90mm
For Compression Test:						
Pair of compression plates	200mm	200mm	200mm	200mm	200mm	220mm
Dia of circular platen						
Crosshead geared motor (kW)	0.74kW	0.55kW	0.74kW	0.74kW	1.1kW	1.5kW
Power pack motor (kW)	0.75kW	1.5kW	1.5kW	1.5kW	1.5kW	1.5kW
Weight (approx)	1700kg	2500kg	3500kg	5000kg	6000kg	9500kg



Automatic Universal Testing Machine for Strand Wire (Load and Displacement Controlled)

AIM 655SMCA-600 & AIM 655SMCA-1000

(Similar to AIM 652SMCA-600 & AIM 653SMCA-1000 except loading unit)

Specifications		
MODEL NO	AIM 655SMCA-600	AIM 655SMCA-1000
Capacity	600kN	1000kN
Machine Type	6 Pillar with Hydraulic Grips	6 Pillar with Hydraulic Grips
Load Resolution	0.01 kN	0.01 kN
Displacement Resolution of Piston	0.1 mm	0.1mm
Extensometer Resolution	0.001mm	0.001mm
Control Type	Automatic	Automatic
Control Parameter	Load/Displacement	Load/Displacement
Load Control Range	0.5 to 10 kN /sec	0.5 to 12 kN /sec
Displacement Control Range	0.001 to 10 mm/ sec	0.001 to 10 mm/ sec
Load Release Type	Automatic	Automatic
Max Clearance for tensile test	1000mm	1000mm
Max Clearance for Compression test	900mm	900mm
Clearance between columns	375mm	455mm
Piston Stroke	200mm	200mm
Middle beam lifting speed	320 mm/min	320 mm/min
For Tension Test		
Clamping jaws for round specimens	14-32- & 32-40mm diameter	14-32- & 32-40mm diameter
For Flat Test		
Clamping jaws for flat specimen's	0-20 mm	0-40 mm
Strand Wire Jaws	6-12 mm & 12-18 mm diameter	6-12 mm & 12-18 mm diameter
For Compression Test: Pair of compression plates Dia of circular platen	220mm	233mm
The maximum distance between the bending test	300mm	300mm
Total Power	1.5KW	1.5KW
Power supply	440V, 50Hz, Three Phase, AC supply.	440V, 50Hz, Three Phase, AC supply.

Ordering Information :

AIM 655SMCA-600	Automatic Universal Testing Machine for Stand Wire Testing, 600 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled
AIM 655SMCA-1000	Automatic Universal Testing Machine for Stand Wire Testing, 1000 kN Capacity, 6-Pillar Type, Hydraulic Grips, with Automatic Load & Displacement Controlled

Note: 1 UTM is supplied with Aimil Software. Computer will be supplied at an extra cost.

Note: 2 Modifications in optional accessories can be made on request.

Note: 3 NABL Accredited Calibration Certificate for force parameter will be supplied along with machine.



Static cum Cyclic Universal Testing Machine

AIM-651SC-300, AIM-652SC-600, AIM-653SC-1000, AIM-653SC-1200, AIM-653SC-1500 & AIM-653SC-2000,

Ref. Standard: IS 1608, (Part I), IS 1786, ASTM -A370, ASTM-E8/E8M, IS 1828 (Part I), IS 1599

Aimil Series of Servo Controlled Universal Testing Machines are the finest of their types available. The rugged construction and extreme simplicity makes it possible for personnel with minimum Training to operate them with ease and complete dependability.

It has provision for automatically turning the pump on and off, controlling the set pace rate/ displacement rate and switching the machine off under predetermined conditions.

The Control releases the pressure at the end of every run and reinitializes the machine at the beginning of every test. Data acquisition, storage, management and analysis are all fully automated.

The system has essentially three parts.

- Loading Unit
- Hydraulic Power Pack
- Control Unit & Display

Loading Units

It consists of a hydraulic cylinder & piston mounted on a robust base. The loading frame consists of an upper crosshead, middle crosshead and lower table. The upper cross-head and lower table are fitted on two/four hard chrome plated columns. The middle cross-head is fitted on two threaded columns. A reduction gear motor drives the chain and sprockets fixed at the bottom of the threaded columns for height adjustments. The cylinder and ram are individually lapped to eliminate friction. Axial loading of the system is ensured by provision of a ball seating under the lower table. An encoder is provided for measurement of deformation of various samples. Tensile test is conducted by gripping the test specimen between the upper and middle cross-heads. Compression, Transverse, Bending and Shear test are conducted between the middle crosshead and the lower table.

Hydraulic Power Pack with Oil Cooling Arrangement

- Max. working pressure: 300bar
- Hydraulic ports for connection of test frames
- Oil flow control via servo-controlled proportional valve
- Oil water cooling system with forced ventilation
- Operating temperature range for servo valve : -29°C to 135°C.
- Burst pressure : 250% max supply pressure
- External Leakage : zero.
- With oil cooling arrangement
- Supply pressure : constant

Hardware and Controlling Unit

- Analog Resolution: 24bit
- Inbuilt RTC for the real time in standalone mode
- Easy Configurable Windows Based Software to configure the DAQ through PC
- Real time Data Acquisition system controllable through PC also
- LCD display with 4 line 20 characters with back light
- Working range of load control 0.2 to 2% of full scale
- Working range of displacement control 1 micron to 1000 micron per sec
- Display functions – channel data
- Power supply – 440V, 3 Phase
- Inbuilt battery for Real time clock.
- Accepts input as analog voltage in the range of $\pm 2.5V$.

Analog Inputs:

- Maximum 8 number of analog channels
- Maximum Input Voltage : 0-2.5V $\pm 2.5V$
- Accuracy 0.1%
- Over Protection Voltage



AIM-653SC-1000

Memory & Communication:

- Internal storage capacity is 8 M bit (approx. 2MB)
- Data can be stored in PC directly

Communication Interfaces:

- USB

Software for UTM

Aimil recognizes that the most efficient way of testing is with the help of software and the ease of its operation. The Aimil UTM 1.1 has been ergonomically designed to suit the various needs of the customers as per their requirements and operation of the software is extremely user friendly and the features are self-explanatory.

Features

- Tensile Testing
- Compression Testing
- Transverse Test for flat sample
- Bend & Rebend Test
- Shear Test
- Extensometer Test
- Flexure Test
- Rope Test



Material Testing

The bright, large and prominent display for the load and displacement adds to the readability of the software and hence effortless observation of the online tests.

The enhanced display of the test screen displays the value of the load and displacement and the online graphs as it is generated during the tests. The selection of the scale on graph enables you to view the graph more prominently on the screen. The extensometer test screen incorporates the results of the normal Load Vs Displacement. Test as well as the Load Vs Extension and Stress Vs Strain online graphical view simultaneously, a unique facility on its own.

Software Capability

- Control parameter - load/displacement
- Database backup & restore facilities are available
- Customizable report – header / footer
- The default report generated automatically in crystal reports & can be printed directly. The reports can also be exported to excel
- User can set starting point of graph line
- User can set failure detection percentage
- Automatic change over graph scale
- Display of Load Vs Displacement & Stress Vs Strain graph in real time
- Printout of Load Vs Displacement, Stress Vs Strain graph & test results
- User can analyze the report from test data & also define 0.1% & 0.2% proof stress line
- Overload feature which stops the machine when the maximum define load is reached

Statistical Analysis:

This powerful tool enables the user to compare and study the results in a statistical format.

Most useful in places where the Batch Reports are studied for the production.

This extraordinary feature has been designed keeping in mind the ever changing needs of the industry to achieve higher standards.

This flexibility can be achieved with the Aimil Software with an assurance of lifetime quality service and updates as per the latest industry standards.

The test data can be analysed for following graphical presentations :

- I Mean Deviation
- III Skew Diagram
- II Frequency Distribution
- IV Histogram

- **Security Manager** : This helps the user to protect and save the test data of all the previous tests with help of Password Protection feature.

- **Additional Feature** include the facility to incorporate the users Company Logo on the Test Report and can provide wide variety of customization of the software features as per the needs of the customer.

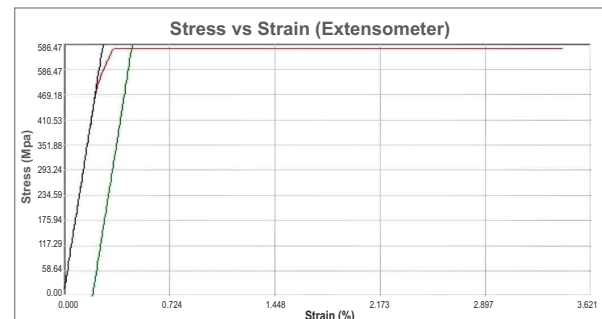
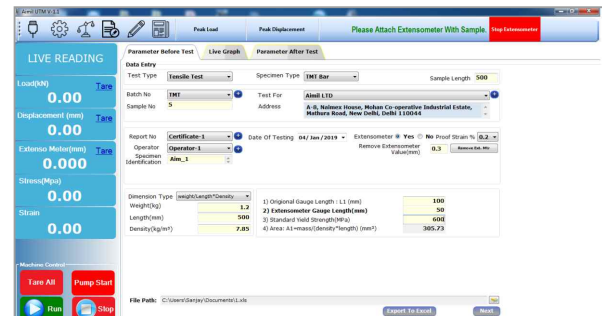
Minimum Recommended Computer Hardware

- 2 GHz Pentium Dual Core or equivalent
- 4 GB RAM, although using multiple testing machines may require additional memory and/or a faster processor
- 256 MB DirectX 9.0 capable video card
- 250GB HD Drive
- CD-ROM Drive
- Mouse or pointing device and keyboard supported by Windows
- Monitor that supports at least 1024 x 768 resolution and 32-bit color
- 2 USB Serial Port adapter per machine
- Windows compatible printer recommended for reporting capabilities
- Windows compatible sound card and speakers (for audio playback)
- Additional USB ports for measuring devices, barcode scanners, printer etc.
- At least 1 integrated serial port (not USB) where possible

Software Requirements

- The Aimil Software's are designed for 32-bit & 64-bit operating systems running Windows 7, Windows 8, Window 10 and above. It does Not support Windows XP and below.
- Internet Explorer 8 or higher.

Note: A 64-bit operating system is preferred for best Performance



**Ordering Information :**

AIM 651SC-300	Static cum Cyclic Universal Testing Machine, 300 kN Capacity, 6-Pillar Type with Hydraulic Grips
AIM 652SC-600	Static cum Cyclic Universal Testing Machine, 600 kN Capacity, 6-Pillar Type with Hydraulic Grips
AIM 653SC-1000	Static cum Cyclic Universal Testing Machine, 1000 kN Capacity, 6-Pillar Type with Hydraulic Grips
AIM 653SC-1200	Static cum Cyclic Universal Testing Machine, 1200 kN Capacity, 6-Pillar Type with Hydraulic Grips
AIM 653SC-1500	Static cum Cyclic Universal Testing Machine, 1500 kN Capacity, 6-Pillar Type with Hydraulic Grips
AIM 653SC-2000	Static cum Cyclic Universal Testing Machine, 2000 kN Capacity, 6-Pillar Type with Hydraulic Grips

Optional Accessories for all capacities

AIM-65106	Transverse test set (roller width - 160mm, Dia - 50mm, clearance between supports - 600mm)
AIM-65109	Electronic extensometer strain gauge type with 2.5mm extension and gauge length 25 & 50mm
AIM-65110	Brinell test attachment for 400kN UTM
AIM-65210	Brinell test attachment for 600kN UTM
AIM-65318	Brinell test attachment for 1000kN UTM
AIM-65111	Bend test attachment 180°
AIM-65112	Flexural test attachment
AIM-65113	Shear test attachment for 6, 8, 12, 16 & 20mm dia samples
AIM-65114	Shear test attachment for 25, 30, 35 & 40 mm dia samples
AIM-65115	Pair of threaded holding heads 8, 10, 12, 14, 16, 18, 20, 22, 24, 27mm (per set)
AIM-65116	Gripping device for threaded & shouldered specimens
AIM-65117	Pair of split ring for shouldered specimen 8, 10, 12, 14, 16, 18, 20, 22, 24, 27mm (per set)

Note: 1 UTM is supplied with Aimil Software. Computer will be supplied at an extra cost.

Note: 2 Modifications in optional accessories can be made on request.

Note: 3 NABL Accredited Calibration Certificate for force parameter will be supplied along with machine.



Material Testing

Static cum Cyclic Universal Testing Machine Model Available:

Capacity 300 kN, 600 kN, 1000 kN, 1200 kN, 1500 kN & 2000kN

Specifications						
MODEL NO	AIM 651SC-300	AIM 652SC-600	AIM 653SC-1000	AIM 653SC-1200	AIM 653SC-1500	AIM 653SC-2000
Machine capacity	300 kN	600 kN	1000 kN	1200 kN	1500 kN	2000 kN
Accuracy	±1 %	±1 %	±1 %	±1 %	±1 %	±1 %
Load Resolution	0.01 kN	0.01 kN	0.1 kN	0.1 kN	0.1 kN	0.1 kN
Elongation Scale Resolution	0.01mm	0.01mm	0.01mm	0.01mm	0.01mm	0.01mm
Extensometer Resolution	0.001mm	0.001mm	0.001mm	0.001mm	0.001mm	0.001m
Control Type	Automatic	Automatic	Automatic	Automatic	Automatic	Automatic
Control Parameter	Load/Displacement	Load/Displacement	Load/Displacement	Load/Displacement	Load/Displacement	Load/Displacement
Loading Type	Static and Cyclic	Static and Cyclic	Static and Cyclic	Static and Cyclic	Static and Cyclic	Static and Cyclic
Max Clearance for tensile test	600mm	700mm	800mm	850mm	850mm	900mm
Max Clearance for Compression test	540mm	650mm	750mm	800mm	800mm	850mm
Clearance between columns	375mm	455mm	540mm	700mm	850mm	850mm
Ram Stroke	200mm	200mm	200mm	250mm	250mm	300mm
Straining/piston speed at no load	0 - 115mm/min.	0 - 80mm/min.	0 - 70mm/min.	0 - 60mm/min.	0 - 60mm/min.	0 - 50mm/min.
For Tension Test						
Clamping jaws for round specimens	6 - 12mm 12 - 22mm 22 - 32mm	8 - 15mm 13 - 26mm 26 - 40mm	8 - 15mm 16 - 25mm 26 - 40mm	8 - 16mm 16 - 25mm 40 - 60mm	10 - 25mm 20 - 40mm 45 - 70mm	20 - 40mm 25 - 45mm 60 - 80mm
Clamping jaws for flat specimens thickness	0 - 20mm	0 - 30mm	0 - 40mm	0 - 22mm 22-44mm	0 - 22mm 22-44mm 44-70mm	0 - 20mm 20-45mm 45-70mm
Flat specimen width	70mm	90mm	110mm	70mm	100mm	90mm
For Compression Test:						
Pair of compression plates	200mm	200mm	200mm	200mm	200mm	220mm
Dia of circular platen						
Crosshead geared motor (kW)	0.74kW	0.55kW	0.74kW	0.74kW	1.1kW	1.5kW
Power pack motor (kW)	1.49kW	2.2kW	2.2kW	2.6kW	4.9kW	4.9kW
Weight (approx)	1700kg	2500kg	3500kg	5000kg	6000kg	9500kg



Static cum Cyclic Universal Testing Machine for Strand Wire

AIM 655SC-600 & AIM 655SC-1000

Ref Standard: IS 14268

(Similar to AIM 652SC-600 & AIM 653SSC-1000 except loading unit)

Specifications		
MODEL NO	AIM 655SC-600	AIM 655SC-1000
Capacity	600kN	1000kN
Machine Type	6 Pillar with Hydraulic Grips	6 Pillar with Hydraulic Grips
Load Resolution	0.01 kN	0.01 kN
Displacement Resolution of Piston	0.1 mm	0.1mm
Extensometer Resolution	0.001mm	0.001mm
Control Type	Automatic	Automatic
Control Parameter	Load/Displacement	Load/Displacement
Load Release Type	Automatic	Automatic
Loading Type	Static and Cyclic	Static and Cyclic
Max Clearance for tensile test	1000mm	1000mm
Max Clearance for Compression test	900mm	900mm
Clearance between columns	375mm	455mm
Piston Stroke	200mm	200mm
Straining/piston speed	120mm/min	100mm/min
Middle beam lifting speed	320 mm/min	320 mm/min
For Tension Test		
Clamping jaws for round specimens	14-32- & 32-40mm diameter	14-32- & 32-40mm diameter
For Flat Test		
Clamping jaws for flat specimen's	0-20 mm	0-40 mm
Strand Wire Jaws	6-12 mm & 12-18 mm diameter	6-12 mm & 12-18 mm diameter
For Compression Test: Pair of compression plates Dia of circular platen	220mm	233mm
The maximum distance between the bending test	300mm	300mm
Total Power	2.2KW	2.2KW
Power supply	440V, 50Hz, Three Phase, AC supply.	440V, 50Hz, Three Phase, AC supply.

Ordering Information :

AIM 655SC-600	Static cum Cyclic Universal Testing Machine for Strand Wire, 600 kN Capacity, 6-Pillar Type with Hydraulic Grips
AIM 655SC-1000	Static cum Cyclic Universal Testing Machine for Strand Wire, 1000 kN Capacity, 6-Pillar Type with Hydraulic Grips

Note: 1 UTM is supplied with Aimil Software. Computer will be supplied at an extra cost.

Note: 2 Modifications in optional accessories can be made on request.

Note: 3 NABL Accredited Calibration Certificate for force parameter will be supplied along with machine.



Computer Controlled Electromechanical Universal Testing Machine

**AIM 653EM-5, AIM 653EM-10, AIM 653EM-20, AIM 653EM-30,
AIM 653EM-50, AIM 653EM-100, AIM 653EM-200 & AIM 653EM-300**

Ref. Standard: EN 1348, EN 12004, EN 12003, BS 5980, BIS 15477, ANSI 118.1, EN 1348, EN 1324, EN 1308, EN 1346, EN 1308, ASTM C348, ASTM C349, EN 1306, ISO13007-2, ISO13007-4, ASTM C307, ASTM D4632, ASTMD4833, ASTMD6241, ASTMD4533, ASTMD4595

The Computer Controlled Electromechanical Universal Testing Machine is a high-precision device designed and manufactured in compliance with IS, ASTM, ISO, DIN, and other standards. It is ideal for conducting tension, compression, bending, and shearing tests on a wide range of materials. This versatile machine can also perform tests such as peeling and tearing on metals, non-metals, and composite materials with precision and efficiency. Managed by a computer with a modular program design, it ensures automatic data storage, analysis, and report generation. Equipped with a PC system and printer, it offers real-time graphing, test result display, programmable test control, and data processing, making it indispensable in industrial settings, educational institutions, and research facilities.

Machine supplied with following standard fixtures:

- Metal tensile test fixture
- Compression test fixture

Features:

- Remote Control Box: Adjust the crossbeam speed easily and switch freely.
- Automatic Return Function: Returns to the original position quickly and efficiently.
- Safety Protections: Includes limit protection for any working position, over-voltage, and over-current protections.
- Data Handling: Strong test data management allows saving, querying, and retrieving test data at any time.
- Multiple Control Modes: Constant speed control for force, stress, deformation, strain, stroke, load, elongation, displacement, and low cycle with user self-programming control.
- Versatile Test Curves: Switch among stress-strain, load-deformation, load-displacement, load-time, deformation-time, displacement-time, load-strain curves, and more for detailed analysis.
- Automatic Speed Adjusting: The machine allows for preset test speeds to be maintained throughout the test process.
- Accurate Calibration and Auto Limit Protection: Features precise calibration capabilities and automatic protection limits to ensure safe and reliable testing.
- High-Precision Components: Equipped with a high-precision load cell, rotary encoder & ball screws.
- Automatically saves data upon test completion to prevent data loss due to unexpected power failures.
- Calculates various test parameters including maximum loading force, tensile strength, loading for constant elongation, and more.

Detailed Design and Components

- Load Frame: Aluminum alloy cover with streamlined design. High-intensity testing machine structure and crosshead. High stiffness to assure accuracy.
- Precise Ball Bearing Screws: Ensure smooth and accurate movement during testing.



AIM 653EM-5 (5kN)



AIM 653EM-200 (200kN)



Metal Tensile Attachment



Compression platen



- Drive System: Equipped with an AC servo motor and drive system for reliable performance.
- Hand-Held Controller: Allows control of the crosshead movement for inching and gap adjustment without needing to operate from the PC.
- Precise Load Cell: Delivers very accurate readings for all measurements.
- Computer Control Software: Provides a versatile testing range and detailed analysis.

Ordering Information :

AIM 653EM-5	Computer Controlled Electromechanical Universal Testing Machine, 5kN Capacity
AIM 653EM-10	Computer Controlled Electromechanical Universal Testing Machine, 10kN Capacity
AIM 653EM-20	Computer Controlled Electromechanical Universal Testing Machine, 20kN Capacity
AIM 653EM-30	Computer Controlled Electromechanical Universal Testing Machine, 30kN Capacity
AIM 653EM-50	Computer Controlled Electromechanical Universal Testing Machine, 50kN Capacity
AIM 653EM-100	Computer Controlled Electromechanical Universal Testing Machine, 100kN Capacity
AIM 653EM-200	Computer Controlled Electromechanical Universal Testing Machine, 200kN Capacity
AIM 653EM-300	Computer Controlled Electromechanical Universal Testing Machine, 300kN Capacity

Accessories/ Attachments for Geotextile Testing (Optional)

- CBR Puncture • Rubber Tensile Fixture • Tear Fixture • Wide with Tensile • Grab Test Fixture
- Geo-Grid Tensile Test Fixture • Large Deformation



CBR Puncture



Tear Fixture



Wide with Tensile



Grab Test Fixture



Geo-Grid Tensile
Test Fixture



Material Testing

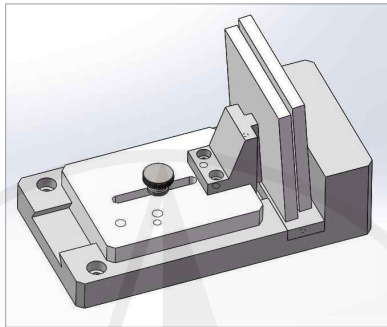
Accessories/ Attachments for Tile/Grout Testing (Optional)



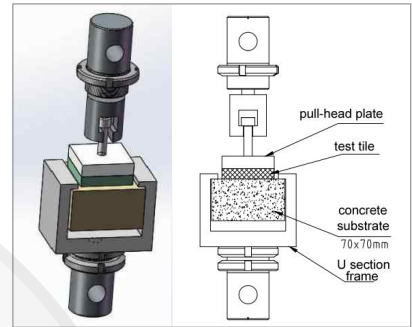
Compression shear adhesion strength jib for adhesives (ISO13007-2)



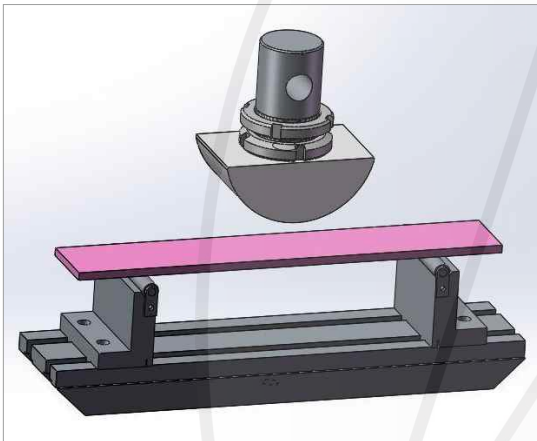
3-point flexure fixture for grouts (ISO13007-4)



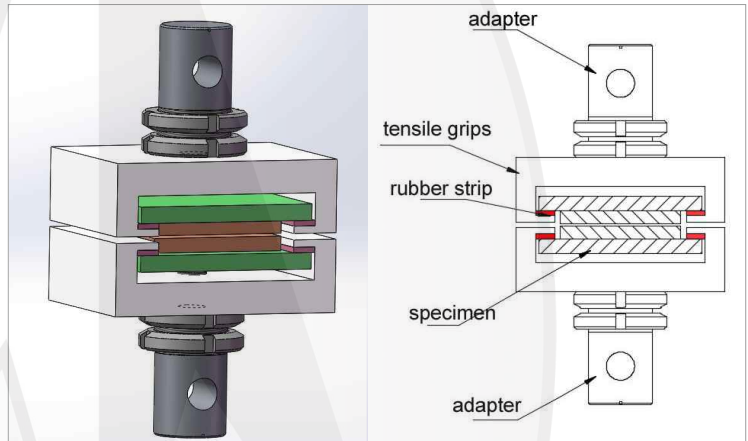
Compression fixture for grouts (ISO13007-4)



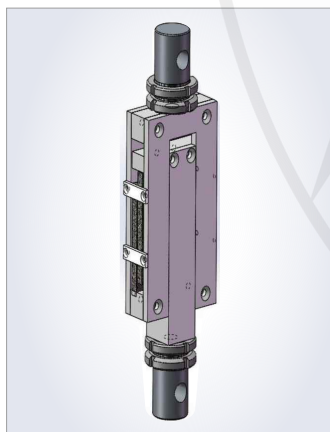
Tensile adhesion strength pull-head plate for adhesives (ISO13007-2)



Transverse deformation fixture (ISO13007-2)



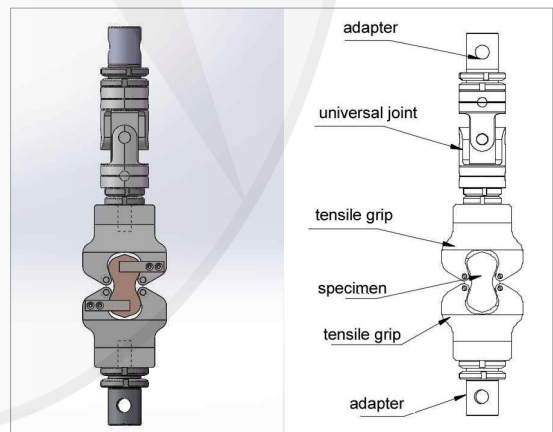
Tensile adhesion strength jig for adhesives (BS5980)



Shear adhesion strength jig for adhesives (BS5980)



Compression platen



ASTM C307 Tensile grips, The upper part adopts a universal joint, which automatically aligned during tensile test.

Accessories/ Attachments for other Materials (Optional)

• Rubber Tensile Fixture • Plastic Tensile Fixture etc.



Computer Controlled Electromechanical Universal Testing Machine Model Available:

Specifications						
MODEL NO	AIM 653EM-5	AIM 653EM-10	AIM 653EM-20/30	AIM 653EM-50	IM 653EM-100	AIM 653EM-200/300
Max. loading capacity	5kN (Single Column)	10kN	20kN & 30kN	50kN	100kN	200kN & 300kN
Testing grade		class 1	class 1	class 1	class 1	class 1 class 1
Loading measuring range	0.4% -100%	0.4% -100%F.S	0.4% -100% F.S	0.4% -100% F.S	0.4% ~ 100%F.S	0.4% ~ 100%F.S
Loading measuring accuracy	better than $\pm 0.5\%$	better than $\pm 0.5\%$	better than $\pm 0.5\%$	better than $\pm 0.1\%$	better than $\pm 0.5\%$	better than $\pm 0.5\%$
Load Display Resolution	0.001N	0.001N	0.001N	0.001N	0.001N	0.001N
Load Control Range	0.005-5%FS/S	0.005-5%FS/S	0.005-5%FS/S	0.005-5%FS/S	0.005-5%FS/S	0.005-5%FS/S
Load Control Accuracy	within $\pm 0.5\%$	within $\pm 0.5\%$	within $\pm 0.5\%$	within $\pm 0.5\%$	within $\pm 0.5\%$	within $\pm 0.5\%$
Displacement resolution	0.001mm	0.001mm	0.001mm	0.001mm	0.001mm	0.001mm
Displacement measurement accuracy	better than $\pm 0.5\%$	better than $\pm 0.5\%$	better than $\pm 0.5\%$	better than $\pm 0.5\%$	better than $\pm 0.5\%$	better than $\pm 0.5\%$
Test speed range	0.01-500mm / min	0.01-500mm / min	0.01-500mm / min	0.01-500mm / min	0.01 — 350mm / min	0.01-260mm / min
Vertical tensile space	800mm (excluding fixture)	900mm (excluding fixture)	900mm (excluding fixture)	900mm (excluding fixture)	900mm (excluding fixture)	800mm (excluding fixture)
Test width	/	400mm	400mm	400mm	400mm	540mm
Compression plate diameter	100mm	120mm	120mm	120mm	150mm	150mm
Round Jaws	/	/	/	4-9mm	4-9mm	4-9mm / 9-14mm
Flat Jaws	wave type	0-7mm	0-7mm	0-7mm	0-7mm	0-9mm
Motor	servo motor	Servo motor	Servo motor	Servo motor	Servo motor	Servo motor
Motor Power	400W	400W	750W	1.2KW	1.5KW	3.6KW/4.6KW
Load Sensor	S type	S type	Spoke type	Spoke type	Spoke type	Spoke type
Control Method	Computer Control	Computer Control	Computer control	Computer Control	Computer Control	Computer Control
Main unit size	Around 580x400x1450 mm	Around 760x580x1870 mm	Around 760x580x1870 mm	760x580x1900mm	Around 760x600x1950 mm	Around 1000x680x2230mm
Weight	100KG	180KG	220KG	260KG	400KG	800KG
Power supply	220VAC 50HZ	220VAC 50HZ	220VAC 50HZ	220VAC 50HZ	220VAC 50HZ	220VAC 50HZ

Note:

- The 5kN EUTM is a single-column type; all other capacity EUTMs are twin-column types.
- Machine supplied with NABL accredited calibration certificate of force (Compression) parameter.
- Machine supplied with computer system and installed control software.
- As a universal testing system, the EUTM is highly versatile. In addition to the listed standards, custom attachments and fixtures can be designed and supplied upon request to accommodate a wide range of material testing applications.



Mixed-Mode Bending Test Fixture

AIM 65319

Ref. Standard: ASTM D6671-01

The Mixed-Mode Bending Test Fixture is designed for use with a Universal Testing Machine (UTM). It evaluates the interlaminar fracture toughness of fiber-reinforced polymer matrix composites under combined Mode I and Mode II loading conditions. The fixture ensures precise force distribution and alignment, delivering accurate and repeatable test results.

Applications

- Composite Delamination Testing
- Aerospace Structural Analysis
- Adhesive Joint Fracture Evaluation

Key Features

- Adjustable Loading Ratio for different Mode I/Mode II proportions.
- Rigid Construction using high-strength steel/aluminum.
- Accurate Load Application with precision-aligned bearings.
- Quick Specimen Mounting with a secure clamping mechanism.
- Safety Features including overload protection and emergency stop.

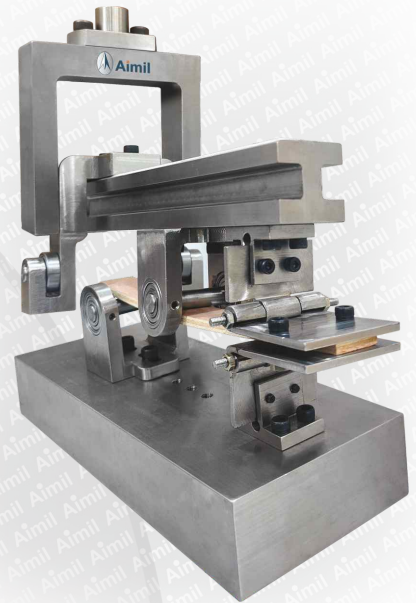
Technical Specifications

Parameter	Specification
Specimen Size	20-25 mm width, 3-5 mm thickness
Load Application	Mixed Mode Bending (MMB)
Lever Arm Length	Adjustable (up to 50 mm)
Material	High-strength steel

Ordering Information :

AIM 65319 Mixed-Mode Bending Test Fixture as per ASTM D6671-01

Note: This fixture is designed for use with a Universal Testing Machine (UTM). The UTM machine can be ordered separately.



AIM 65319

Brinell cum Rockwell Hardness Tester

AIM 663

Ref. Standard: IS 1586

Hardness is the property of a material that enables it to resist plastic deformation usually by penetration. However, the term hardness may also refer to resistance to bending, scratching, abrasion or cutting.

There are various Hardness Testing Methods.

Aimil Hardness Testing Machine is designed for conducting Brinell & Rockwell Hardness Tests on metallic materials, alloys of all types, hard or soft & of all shapes.

Features:

- Sturdy & Reliable Design.
- Easy to operate.
- Accessories of Brinell & Rockwell Test are part of standard outfit.
- There are 4 quick load change options 60, 100, 150 kgf for Rockwell Test (HRA, HRB, HRC) and 187.5 kgf (BHN) for Brinell Test in this machine.
- Direct reading of Rockwell scales HR - A, B, C.
- Samples upto 230mm high & 155mm Throat depth can be tested.

Technical Specification:

Rockwell Scales - A, B, C

Brinell Hardness

Hardness Resolution - 1.0 of a Rockwell unit

Test loads:

Rockwell - 10 kgf Pre Load / 60, 100, 150 kgf Main load.

Brinell - 10 kgf Pre Load / 187.5 kgf Main load.

Display - Analogue.



AIM 663



Specimen accommodations:

Vertical space - 230mm

Horizontal space (from central line) - 155mm

Machine Specifications:

Machine Dimensions -

655 mm(H) x 170 mm(W) x 475 mm(D)

Machine Weight - 85kg (Approximately)

Power Supply - 220V, 1ph, 50Hz (For Brinell Microscope only)

Ordering Information :

AIM 663 Brinell cum Rockwell Hardness Tester

Fatigue Testing Machine

AIM 664

Ref. Standard: IS 5075

Fatigue is one of the major reasons for failure of the materials used in all engineering designs, hence It is important to know fatigue properties of major materials before using them for actual application. Fatigue failure is a phenomenon in which a component fails due to repeated loading – load fluctuating between two extreme (maximum & minimum) values. There are various ways of application of repeated loadings.

Aimil Fatigue Failure Testing Machine is designed for applying reversed bending loads on the specimen. In this type of loading the fibres in the test specimen are stressed in compression & tension alternately.

Features:

- Compact simple design, light weight.
- Table top model.
- Easy Load changing arrangement through lever.



AIM 664

Technical Specifications

Maximum bending moment	200 kg cm
Bending moment adjustable	25-200 kg cm
Ranges	25-125 kg cm 125-200 kg cm
Gripping dia of specimen	12 mm
Testing dia of Specimen	8 mm
Rotating Speed	4200 rpm
Accuracy of applied bending moment	± 1%
Digital counter	8 digit
Power required	0.5 HP
Main supply	415V, 50Hz, 3Ph, AC
Overall size (approx)	1000mm (L) x 500mm (W) x 600mm (H)
Weight (approx)	120 Kg

Ordering Information :

AIM 664 Fatigue Testing Machine



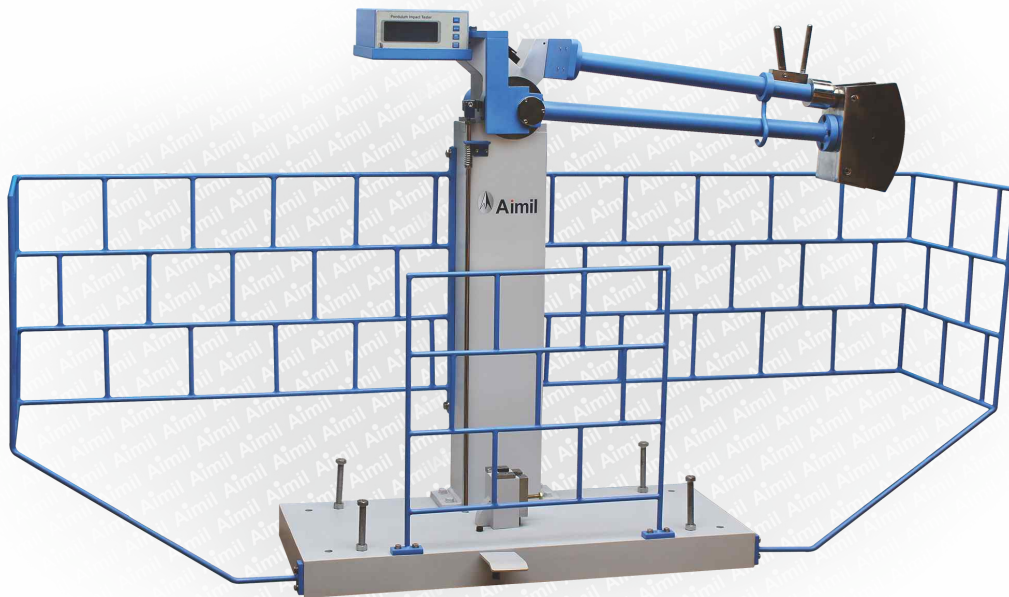
Digital Impact Testing Machine

AIM 665

Ref. Standard: IS 3766

Impact testers are designed to determine the strength of a sample under impact load. This information is important as this strength determines the performance characteristics of the material under impact loading conditions.

Interchangeable strikers, adjustable pendulum drop angle and easy to mount test specimens in the specimen holders, make Aimil Impact tester user friendly and measure the impact resistance of a variety of materials in both Izod and Charpy methods. The basic instrument for conducting both the test methods are same. However the attachments and mounting arrangements for these tests are specific to the tests.



AIM 665

Technical Specifications		
	Charpy Test	Izod Test
Pendulum drop angle	$140^{\circ} \pm 1^{\circ}$	$85^{\circ} \pm 1^{\circ}$
Pendulum effective weight	20.59 ± 1 kgs.	21.79 ± 1 kgs.
Pendulum impact energy	30 kgm, 294 J	16.52 kgm, 162 J
Least count	0.1 kgm, 0.01 J	0.1 kgm, 0.01 J
Distance of axis of hammer rotation and centre	825 mm	825 mm
Striking Edge Angle	$30^{\circ} \pm 1^{\circ}$	$75^{\circ} \pm 1^{\circ}$
Radius of curvature	2.25 mm	0.75 mm
Width	18mm	Horizontal: 10° Vertical relief: 5°
Support Distance between arms	40 mm	For gripping specimen with dimension 10mm X 10mm
Sloping angle	0°	
Relief angle	10°	
Radius of curvature	1.25mm	

Ordering Information :

AIM 665 Digital Impact Testing machine for Izod and Charpy test



Digital Torsion Testing Machine

AIM 670-1

Torsion is the twisting of an object due to an applied torque & is hence expressed in Nm or lbf ft. Torsion Tests are done on materials to determine properties such as the modulus of elasticity in shear, the torsion yield strength & the modulus of rupture.

Torsion testing equipment consists of:

- A twisting head with a chuck for gripping the specimen and for applying the twisting movements to the specimen.
- A weight head, which grips the other end of the specimen & measures the twisting movement or torque.

Features:

- Sturdy & reliable design
- Easy to operate
- Measurement of Torque with electronic load cell
- Accuracy of Torque measurements $\pm 1\%$ above $1/5$ th of the range
- Can conduct torsion tests on both metallic & non-metallic materials
- Windows based software for unloading data
- Data download through RS 232 in text, excel & csv format
- Online degree vs torque graph
- Clear memory, date & time setting facility
- Data stored with test no., date, time, revolution, degree & torque

Technical Specifications

Maximum capacity	: 100Nm
Least Count	: 0.1Nm
Maximum clearance between grips	: 270mm
Grips for square specimens	: 5-15mm
Grips for flat specimens	: 5-12x40mm
Suitable for operation on 440V, 50Hz, Three Phase, AC supply.	



AIM 670-1

Ordering Information :

AIM 670-1 Digital Torsion Testing Machine

Crushing Strength of Iron Ore Pellets

The Crushing Strength of Iron Ore Pellets is important for the manufacturer because it provides an idea about the quality problems associated with production. For the consumer it acts as a quality indicator for performance in the blast furnace.

Crushing Strength Testing Machine For Iron Pellets

AIM 675

Ref. Standard – ISO 4700, ASTM E 382

Crushing Strength is the maximum compressive load at which an iron ore pellet is broken completely. Compressive load is applied on the pellet between two parallel platens at a uniform speed of 15 ± 5 mm/min over the entire period.

The testing machine is a geared machine of 10kN capacity with the capability to apply load at a uniform rate of 15 ± 5 mm/minute. The machine is supplied with a 10kN load cell for the measurement of load, a Load indicator with facilities for displaying the load, for holding the displayed value at the peak load value & for automatically switching the machine off at the maximum or breaking load.

Suitable for operation on 220V, 50Hz, 1Phase AC supply.



AIM 675

Ordering Information :

AIM 675 Crushing Strength Testing Machine for Iron Ore Pellets



Cast Iron Manhole Cover Testing Machine

AIM 680-HO, AIM 680-EO & AIM 680-DG

Ref. Standard: IS 1726

Manhole covers & frames are widely used in various locations for Drainage & water works. There are 4 grades of Manhole covers & frames based on the locations of their placement & type of traffic coming on them. Aimil Manhole cover testing machines are manufactured with high precision.

Classification:

- Analogue model with hand operated pump
- Analogue model with electrically operated pump
- Digital model with pace rate indicator

Salient features:

- Capacities upto 500kN
- High Stability



AIM 680-DG

Technical Specifications

Vertical Clear between upper platen to base	250mm
Horizontal Clear between pillars	1010mm
Diameter of upper platen	300mm
Base Size	1430mm x 1040mm x 270mm
Capacity of Machine	500kN
Display Resolution	0.02 kN
Hydraulic Pump & Jack	Double acting type

Ordering Information:

AIM 680-HO	Cast Iron Manhole Cover Testing Machine Hand Operated, Analogue, Capacity 500kN
AIM 680-EO	Cast Iron Manhole Cover Testing Machine, Electrically Operated, Analogue, Capacity 500kN
AIM 680-DG	Cast Iron Manhole Cover Testing Machine Electrically Operated, Digital, Capacity 500kN