The UTEST Automatic range of single testing chamber and double testing chamber compression and flexure testing machines have been designed for reliable and consistent testing of mortar samples. These compression and flexure testers are the results of continuous applications and research studies to upgrade the machines with the latest technologies and conform the current standards EN 196-1, 459-2, 1015-11, 13454-2; ASTM C109, C348, C349; BS 3892-1, 4551-1 in terms of its technical properties taking into account client requirements by using suitable accessories. These machines also meet the requirements of CE norms for safety and health of the operator.

Compression and flexure jigs, distance pieces, and also removable transparent front-rear safety doors (should be factory installed) should be ordered separately.

The UTEST automatic cement compression and flexure testing machines consist of very rigid two column single or double chamber frames, automatic hydraulic power pack with data acquisition and control system BC 100.

The UTEST automatic cement compression and flexure testing machines allow less experienced operators to perform the tests. Once the machine has been switched on and the specimen is positioned and centered by the help of centering apparatus. The only required operations are;

- Setting test parameters, including pace rate (only required when the specimen type is changed.)
- Choosing the compression or flexure frame by using the changeover valve.
- Pressing the START button on the control unit.
- The machine automatically starts the rapid approach; switches the test speed after 1% of the load capacity of the machine and stops once the specimen failure.
- Automatically saves the test parameters and test results.

The UTEST automatic cement compression and flexure testing machines consist of very rigid two column single or double chamber frames, automatic hydraulic power pack with data acquisition and control system BC 100.
Power Pack

UTC-4830 Automatic Hydraulic Power Pack, dual stage, controlled by BC 100 is designed to supply the required oil to the load frames for loading. Very silent power pack can load the specimen between 50 N/sec to 2.4 kN/sec with an accuracy of ±5%. A Rapid approach pump is supplied as standard. Safety valve (maximum pressure valve) is used to avoid machine overloading.

Motor

The motor which drives the dual pump is an AC motor, 380 V, 50-60 Hz, 3 phase, 1 hp and 0.75 kW and it is controlled by Omron J7 motor inverter. The variation in the oil flow is executed with the variation of the rotation speed of the motor.

Distribution Block

A distribution block is used to control the oil flow direction supplied by the dual stage pump, the following parts are fitted to the distribution block;

- Solenoid valve
- Safety valve (maximum pressure valve)
- Transducer
- Low pressure gear pump
- High pressure radial piston pump

Dual Stage Pump

The dual stage pump is formed by two groups:

1. Low pressure gear pump
2. High pressure radial piston pump.

On the dual stage pump, a high delivery, low pressure gear pump is used for rapid approach, while a low delivery, high pressure radial piston pump is used for test execution. The Rapid approach facility shortens the time interval from piston start until the upper platen touches to the specimen. This excellent feature helps to save a lot of time when a large number of specimens are going to be tested.

Oil Tank

The tank includes enough oil to fill the mechanism which pushes the ram during the test. The level and oil temperature can be seen on the indicator fitted to the tank. It has 20 L capacity. Hydraulic motor oil, number 46, must be used.

<table>
<thead>
<tr>
<th>Dimensions</th>
<th>360x380x900 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight (approx.)</td>
<td>80 kg</td>
</tr>
<tr>
<td>Power</td>
<td>750 W</td>
</tr>
</tbody>
</table>
BC 100 Unit

BC100 TFT unit is designed to control the machine and processing of data from load-cells and pressure transducers which are fitted to the machine.

All the operations of BC100 are controlled from the front panel consisting of a 800x480 pixel 65535 color resistive touch screen display and function keys. 2 analogue channels are provided for load-cells or pressure transducers.

BC100 TFT unit has easy to use menu options. It displays all menu option listings simultaneously, allowing the operator to access the required option in a seamless manner to activate the option or enter a numeric value to set the test parameters. The BC100 digital graphic display is able to draw real-time “Load vs. Time”, or “Stress vs. Time” graphics.

BC100 TFT unit offers many addition unique features. You can save more than 10000 test results in its internal memory. BC100 unit has support for various off-the-shelf USB printers, supporting both inkjet and laser printers. Thanks to its built-in internet protocol suite, every aspect of BC100 device can be controlled remotely from anywhere around the world.

Main Features

- Pace rate control from 50 N/sec to 2,4 kN/sec depending on piston size
- Can control 2 frames
- Can make test with load control.
- Real time display of test graph.
- CPU card with 32-bit ARM RISC architecture
- Permanent storage capacity up to 10000 test results
- 2 analog channels for different frame load cells
- Programmable digital gain adjustment for load-cell
- 1 / 256000 points resolution per channel
- 10 data per second sample rate for each channel
- Ethernet connecting for computer interface
- 800x480 resolution 65535 color TFT-LCD industrial touchscreen
- 4 main function keys
- Multi-language support
- 3 different unit system selection; kN, Ton and lb
- Real-time clock and date
- Test result visualization and memory management interface
- Remote connection through ethernet
- USB flash disc for importing test results and for firmware
- USB printer support for inkjet and laser printers (ask for compatible models)
- Camera support for real-time video recording during test (ask for compatible models)
- Free of charge PC software for the test control and advanced report generation
Technical Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>UTCM-6331</th>
<th>UTCM-6431</th>
</tr>
</thead>
<tbody>
<tr>
<td>Test Type</td>
<td>Compression</td>
<td>Flexure</td>
</tr>
<tr>
<td>Capacity</td>
<td>250 kN</td>
<td>0.5 to 15 kN</td>
</tr>
<tr>
<td>Class 1 Measuring Range</td>
<td>2.5 to 250 kN</td>
<td>0.5 to 15 kN</td>
</tr>
<tr>
<td>The roughness value for texture of loading and auxiliary platens</td>
<td>( \leq 3.2 \mu m )</td>
<td>( \leq 3.2 \mu m )</td>
</tr>
<tr>
<td>Lower Platen Dimensions</td>
<td>165 mm</td>
<td>165 mm</td>
</tr>
<tr>
<td>Upper Platen Dimensions</td>
<td>165 mm</td>
<td>165 mm</td>
</tr>
<tr>
<td>Maximum Vertical Clearance Between Platens</td>
<td>263 mm</td>
<td>263 mm</td>
</tr>
<tr>
<td>Piston Diameter</td>
<td>160 mm</td>
<td>80 mm</td>
</tr>
<tr>
<td>Maximum Piston Movement</td>
<td>50 mm</td>
<td>50 mm</td>
</tr>
<tr>
<td>Horizontal Clearance</td>
<td>300 mm</td>
<td>200 mm</td>
</tr>
<tr>
<td>Power</td>
<td>750 W</td>
<td>750 W</td>
</tr>
<tr>
<td>Oil Capacity</td>
<td>20 L</td>
<td>20 L</td>
</tr>
<tr>
<td>Maximum Working Pressure</td>
<td>125 bar</td>
<td>30 bar</td>
</tr>
<tr>
<td>Rapid Approach Rate</td>
<td>50 mm/min</td>
<td>80 mm/min</td>
</tr>
<tr>
<td>Dimensions (WxLxH)</td>
<td>830x500x1650 mm</td>
<td>1050x500x1650 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>265 kg</td>
<td>410 kg</td>
</tr>
</tbody>
</table>

Maximum horizontal clearance for placing sample is limited with the border of the platens. Sample must be placed such that its ends will not overlap the ends of platens and it must be centered perfectly.

The suitable vertical clearance for specimen can be adjusted with distance pieces.

Safety Features

- Maximum pressure valves to avoid machine overloading
- Piston travel limit switch
- Emergency stop button
- Software controlled maximum load value
The Automatic Cement Compression Flexural Machine can be controlled (Start, Stop commands) by a computer with the software (given free of charge by UTEST). This software provides data acquisition and management for compression, flexure and splitting tensile test throughout the test execution. The advanced functions for data base management provide an easy navigation of all saved data. The test results certificate includes all descriptive information. Therefore, test parameters can be set and details about the test carried out such as client details, test type, specimen type, user info and other information required can be entered and printed out as well as test report and graph.

Following tests can be done with the UTEST software.

- **Foreign Language Support and Customizable User Interface**
  All contents of experimental data and additional information can be organized by user. Software can be performed in x different languages.

- **Capability to Save 24 test results of different specimens in one test folder**
  Test results, graphics and properties of 24 different specimens can be saved in one folder. Old test folders can be reviewed and be edited easily. Advanced Graphic User Interface Software.

- **Graphical data on the screen is refreshed simultaneously during test procedure**
  Load values can be monitored in high resolution graphics at every 100 milliseconds. User can highlight all 24 different specimen curves or preferred ones in different colors on the graphics. Zooming in–out and dragging can be done easily by mouse. Peak values of curves can be marked on the graphics and user can get load value of any point on the graph via high resolution.

- **Able to save frequently used texts in memory and recall them when necessary**
  Frequently used information like name and location of the laboratory, type and dimensions of mostly used specimens are held in memory and can be written automatically by right clicking on information boxes and selecting frequently used text in menu.

- **Capable to Access and use previously done test data**
  User can access any data of previously completed tests and use in his/her new report since most of the tests have same structure and properties.

- **Able to edit test parameters of the testing equipment through Software**
  All test parameters supported by testing equipment can be changed remotely via software. All test parameters specified by user are downloaded to the device before initializing the test procedure. By this way predefined device parameters will not cause errors in test results.

- **Graphical outputs and reports can be saved as a MS Excel worksheet**
  Test result parameters and graphics are transferred to MS Excel worksheet properly to give user a chance to edit any data and graph easily.

- **Maximum Flexibility to edit report and graph templates**
  User can design his/her custom report template and graphic scheme in MS Excel. In software part, user will define which data will be screened in which cell on the worksheet. Therefore, he/she will be able to monitor test results in his/her specific design.