

Ray-Ran



Advanced Pendulum Impact System

RR-IMT

The Ray-Ran **Universal Pendulum Impact Tester** utilises microprocessor technology to determine the energy required to break or rupture specimens such as plastics, composites, ceramics and nonferrous metals to International testing methods for Izod, Charpy and Tension Impact Testing. Along with Pipe Testing, Component Testing and Puncture Impact testing the Ray-Ran Universal Pendulum Impact Tester should more than meet all your testing requirements.

Built with operator simplicity in mind, its ease of operation and high accuracy makes it ideal for product development and quality control within production, research and development labs and teaching institutions. The apparatus is extremely versatile. Through the combination of highly accurate, solenoid released, variable weight hammers and impact velocities ranging from 1.5m/s to 3.8m/s, impact energies up to 50 Joules can be reached.

To calculate the impact energy, the apparatus uses advanced and highly accurate rotary encoder technology to record the lost angle of the hammer after impacting a test sample against the angle recorded after calibrating the hammer. The resulting lost angle is calculated as the test sample's impact energy by the microprocessor system.

The large on-board liquid crystal display (LCD) provides simple on-screen instruction and using the alpha/numeric membrane keypad test parameters such as usernames, material reference numbers and batch numbers are entered and stored in operator lists for future recall and results presentation.

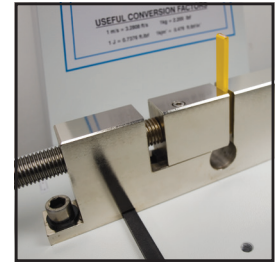
Selecting the type of test is done at the press of a button and the testing parameters such as impact hammer weight, impact velocity and sample size are entered to give the required testing conditions. At the start of each batch of tests, a simple calibration of the apparatus is conducted for bearing resistance and windage and after each test sample has been tested, the results are displayed on the LCD giving the Impact energy in KJ/M, KJ/M², ft/lb.in and ft/lb.in².

Batch statistics of mean, standard deviation and co-efficient of variation are automatically updated after each test and results are shown in graphical and tabular format for analysis when downloaded to the supplied **Techni-Test** PC software. For quality control purposes, High and Low limits can be defined when test results are downloaded showing the user instantly if the material is a pass or fail.

Testing methods available

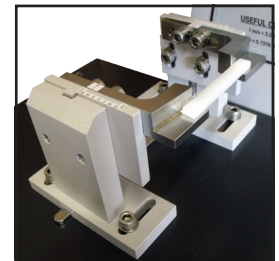
Izod Test

For the Izod test, the specimen is supported and impacted in a cantilevered position with one end of the specimen clamped into the vice. A single swing of the impact hammer is required to break the specimen and the subsequent impact strength calculated. Notched or Un-notched specimens can be tested using the Izod method. Complies to International Test Standards ASTM D256, ASTM D4812 and ISO 180. Impact hammer energies are available from 0.5J up to 25J.



Charpy Test

The Charpy test requires a standard notched or un-notched test specimen to be supported as a horizontal beam and is impacted on either its narrow face or the width of its cross-section. A single swing of the impact hammer is required to break the specimen and the subsequent impact strength calculated. Complies to International Test Standards ISO 179, ASTM D256, ASTM D6110, DIN 53453, DIN 53753, and BS 7413. Impact hammer energies are available from 0.5J up to 50J.



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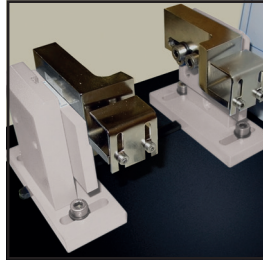
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Tension Impact

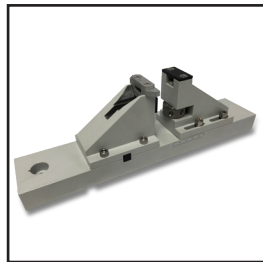
Tensile impact tests are conducted on material samples that are either too thin or exhibit a high elongation before fracture. The test sample, usually in the shape of a tensile bar, is positioned in a horizontal plane with one end supported to the base of the apparatus and the other end supported by a movable clamp. When the pendulum is released it strikes the movable clamp and breaks the test piece along its horizontal axis, thus applying a pure tensile load to the test sample.

Complies to International Test Standard ISO 8256 Method A. Impact hammer energies are available from 0.5J up to 50J.



Pipe Testing

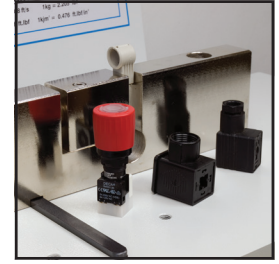
The test is used for the examination of pipe sections and tubing for impact strength properties as either complete segments or small sections of pipes. Sample diameter dimensions up to 25mm can be tested with hammer energies of 7.5 - 15 J. The test specimen is supported as a horizontal beam similar to Charpy tests conditions and complies to International Test Standards ISO 7628 and ISO 9854. Sample diameter dimensions up to 25mm (0.98in) can be tested with hammer energies of 7.5 - 15J (5.6 - 11.1 ft-lbs) or 50J (36.9 ft-lbs), as defined in the ISO standards.



Component test

The component test examines the influences of both the design and the manufacturing processes of a component by measuring the impact energy required to break a complete component, or component part. If a component has a critical cross-sectional area that needs to be tested, then by entering this area into the microprocessor the energy in KJ/M² can be obtained.

The apparatus is supplied as standard with Ray-Ran's **Techni-Test** Windows based PC software for connection to the apparatus via a mini USB or Ethernet connection. Test results can be printed directly from the **Techni-Test** software or can be saved and CSV. files for further analysis in Microsoft Excel, giving the user freedom to display results in the format of their choosing. For quality control purposes, High and Low limits can be defined when test results are downloaded showing the user instantly if the material is a pass or fail



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Technical Specification

- Dedicated microprocessor control
- Touch membrane Alpha / Numeric keypad
- Easy to read liquid crystal display
- Sequence logic menu auto prompt selection
- RS232 interface connector
- Ethernet Interface connector for LAN Networking
- Self-calibration procedure for wind and bearing resistance
- High resolution positional encoder
- Variable pendulum velocity up to 3.8m/s
- Hammer energies up to 50 Joules
- Results in KJ/M and KJ/M²
- Izod, Charpy, Tension, Component, Pipe and Puncture testing
- Electronic levelling device
- Safety guard
- Solenoid pendulum release with audible pre-warning
- Tabular and graphical statistical analysis
- Techni-Test PC software
- Product User Manual
- CE declaration certificate
- Traceable Calibration Certificate
- 1 year return to base warranty

Optional Ancillaries

- Izod Vice
- Charpy Rest
- Tension Impact Rest (Specimen in bed method)
- Puncture Impact Fixture
- Pipe Rest
- Component fixture to customer requirements
- Variable weight impact hammers up to 50 Joules
- Thermal printer
- Full safety enclosure
- Low temperature chamber

Weights & Dimensions

Net Weight (kg)	110
Width (cm)	63
Depth (cm)	50
Height (cm)	76

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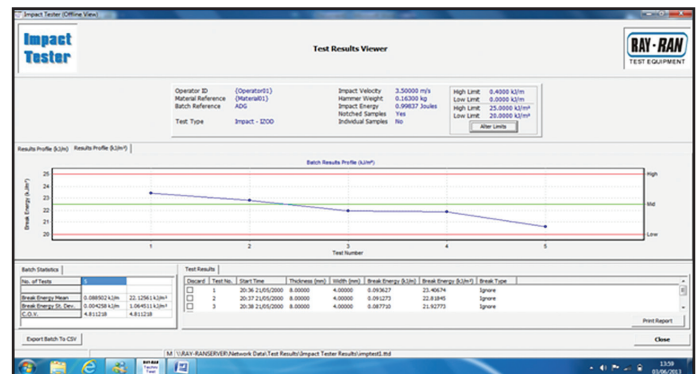
Techni-Test makes a strong impact

Techni-Test is the easy to use software package supplied as standard with the **Universal Pendulum Impact Tester**. **Techni-Test** allows user-defined test data and test results to automatically download from the apparatus for results presentation and data reporting.

Test data downloaded to **Techni-Test** includes operator, material reference, batch reference, test type, impact velocity, hammer weight and impact energy.

From the results graph, each impact test value is clearly identified giving accurate data analysis of the material under test. The graphical impact results can be displayed in KJ/M or KJ/M² by simply selecting the appropriate results profile tab at the top of the graph. By placing the cursor over each plotted point the impact value can also be read on the screen. For internal Quality Control at a glance, high and low limits are clearly displayed on the graph in red, showing instantly if the material is a pass or fail. High and low limits are set on the main screen within the **Techni-Test** software so they can be altered easily without having to re-enter test data and re-test material samples. Tabular results are also displayed under the test results tab for quick results processing and comparison analysis between test samples. **Batch** statistics such as **Mean** and **Co-efficient of Variation** (COV) are also displayed and are updated after each test result is downloaded.

Test results can be printed directly from the **Techni-Test** software in a report format or can be saved and exported as .CSV files. These files can then be opened in Microsoft Excel and manipulated to your specific requirements for use in graphical presentations and reports.



Results screen

In Test Results Viewer mode users have the ability to upload saved results from previous tests for Material Comparison, Data Manipulation or File Export. Abnormal results that could be caused by air voids are clearly identified and can be removed from the test data, bringing the batch statistics into a normal range, ensuring that the test procedure does not have to be repeated, saving time and material. Test results displayed in viewer mode can also be exported as .CSV files easily.

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