

# ADVANCED UNIVERSAL PENDULUM IMPACT TESTER

The Ray-Ran **Advanced Universal Pendulum Impact Tester** utilises advanced microprocessor technology to determine the energy required to break or rupture specimens such as plastics, composites, ceramics and non ferrous 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 of 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. Impact velocities are variable from 1.5 m/s up to 3.8 m/s and combined with highly accurate variable weight hammers which are electronically released by a solenoid, impact energy ranges 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 advanced 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 user names, 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 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 and KJ/M<sup>2</sup>. 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.



**TECHNICAL SPECIFICATION**

- Advanced 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 3.8 m/s
- Hammer energies up to 50 Joules
- Results in KJ/M and KJ/M<sup>2</sup>
- 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

<b>WEIGHTS &amp; DIMENSIONS: RR/IMT</b>	
Net Weight (kg)	110
Width (cm)	63
Depth (cm)	50
Height (cm)	76

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## TESTING METHODS AVAILABLE:

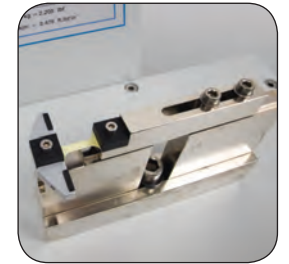
### IZOD TEST

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 0.5 J up to 25 J



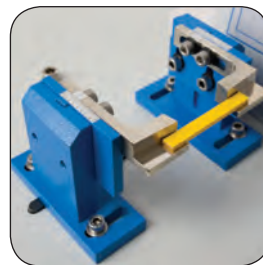
### TENSION IMPACT

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 0.5 J up to 50 J.



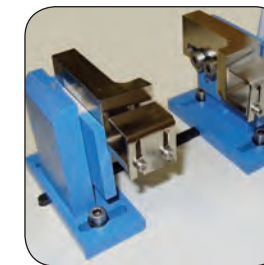
### CHARPY TEST

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 0.5 J up to 50 J



### 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 25 mm 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 25 mm (0.98 in) can be tested with hammer energies of 7.5 - 15 J (5.6 - 11.1 ft-lbs) or 50 J (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 particular component by measuring the impact energy in Joules, required to break a complete or part of a section of a finished component.



If a particular component has a critical cross sectional area that needs to be tested then by entering this area into the microprocessor the energy in  $\text{KJ/M}^2$  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 an RS232 or Ethernet connection. Test results can be printed directly from the **Techni-Test** software or can be saved and exported as .CSV files which can be opened with Microsoft Excel in tabular form which can be manipulated to your specific requirements such as preparing a graphical presentation or copying the results to a Word document for a report presentation if required. 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. If the apparatus is connected to the PC via the Ethernet connector over a LAN network then the RS232 can be used for connection to an optional thermal printer for direct printout by the operator.

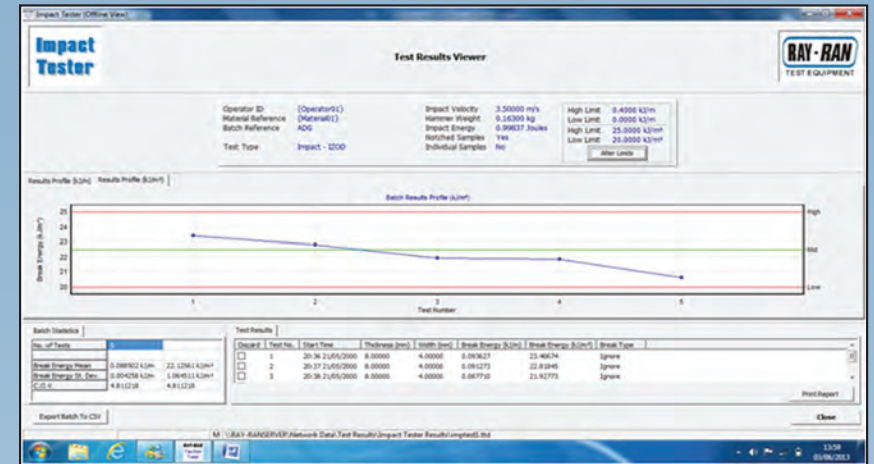


# TECHNI-TEST MAKES A STRONG IMPACT

**Techni-Test** is the easy to use software package supplied as standard with the **Advanced Universal Pendulum Impact Tester**, which 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  $\text{KJ/M}$  or  $\text{KJ/M}^2$  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 procedures 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 which can be opened with Microsoft Excel in tabular form which can be manipulated to your specific requirements such as preparing a graphical presentation or copying the results to a Word document for a report presentation if required

In Test Results Viewer mode users have the ability to upload saved results from previous test 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.