Flexible Packaging Instruments

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The Ink Rub Tester measures the abrasion resistance of printed surfaces. Applications include labels, folding cartons, corrugated boxes, flexible packaging materials and more. The test measurement includes mounting a printed substrate to a test block with a weight of 0.91-kg (2-lb) or 1.81-kg (4-lb). A second flat specimen is placed below the test block and cycled at a controlled speed for a predetermined number of counts. The specimen is then evaluated by comparison or optically to determine the degree of abrasion or smudging that occurred to the image.

**Specifications**

- Three speeds - The standard (42 cycles per minute) and two higher speeds (85 and 100 cycles per minute) let you decrease testing time for samples requiring a higher number of rubs
- Large character LCD Display
- Displays count up, count down, test status and configurations
- Automatic shut-off
- Standards include: ASTM D5264, F 1571, F 2497, TAPPI T-830, FINAT FTM 27

For more info on our flexible packaging instruments, contact Testing Machines, Inc. at (800) 678-3221, or visit www.testingmachines.com
Flexible Packaging Instruments

**Twin Blade Precision Sample Cutter**

The TMI Twin Blade Cutter is designed to cut a precision sample strip from a sheet of material. The robust design features two hardened ground steel blades which provide a precision cut over a base sheer. After extended use, a reconditioning service is available which includes sharpening the blades and replacing the base sheer. Applications include cutting thin plastic films, paper, laminations, foils, non-wovens and other sheet materials. Includes safety shields.

**Specifications**
- Catalog Number 22-34-00
- Sample widths include 15 mm, 25 mm, 50 mm, 63 mm, 0.5 in., 1 in., and 2 in.
- Blades parallel to 0.0254 mm (0.001 in.)
- Hardened steel blades

**Micro Cutting Machine**

Built with absolute simplicity, the Ray-Ran Micro Cutting Machine has been specifically designed to cut thin plastic film and other materials into rectangular strips of varied widths using specific cutting heads. It is Ideal for making Tensile and Tear Test strips to various International Test Standards when conventional die cutting is not suitable. This Ray-Ran apparatus has rapidly become a valuable tool and is ideal for all types of flexible packaging, film, foils and paper up to 250μm (0.25mm) thick.

**Specifications**
- Simple to operate film cutter
- Cuts film up to 250μm (0.25mm) thick
- Minimum sample width 250μm (0.25mm)
- Hardened and ground guide rail system
- Linear roller bearing guides

**6MPCA Advanced Melt Flow System**

The 6MPCA is the most advanced digital model offered within the Ray-Ran range of melt flow index testers. The operating procedure is simple to undertake using its on-board advanced microprocessor technology. The large LCD provides on-screen instructions, reducing user error, and test parameters are easily entered via the keypad. The apparatus can accurately determine results for MFR, MVR and Density at test temperature.

**Specifications**
- Molten polymer extrusion via controlled orifice using set temperature and pressure parameters
- Electronic temperature controller with dual zone heating
- Temperature accurate to +/- 0.1 °C, range 0 to 400°C and resolution +/- 0.01 °C
- Digital encoder accurate to +/- 0.02mm
- Conforms to ASTM D1238, ASTM d3364, ISO 1133, DIN 53735 and others
- Electrical characteristics: 110v@60hz and 220v@50hz - fuse rating: 10amp
Model 32-25 measures the Coefficient of Static Friction between two surfaces of sheet material using an inclined plane and a sled. Static Friction is the force required to start the movement of the sled as the plane is raised and the sled begins to move. The test reports the angle at which the sliding begins. Applications include packaging materials and printed surfaces such as paper, corrugated and plastic film.

**Specifications**
- Catalog Number 32-25-00
- Measurement 0 to 80º angle
- Optional sliding blocks
- Motor driven operation
- Optical sensor automatically stops test after sled movement
- Standards include: TAPPI T 815, TAPPI T 458 ASTM D 4918 and ASTM D 202

The NEW Model 32-76 measures both Static and Kinetic coefficients of friction using the horizontal plane method. Static friction is the force necessary to initialize the movement of a sled and Kinetic friction is the force required to keep the sled moving. The 32-76 features a touch screen user interface for easy set-up and test method storage. Results can be saved to USB drive or printed. Applications include printed, coated or treated surfaces such as packaging films, labels, paper, paperboard, corrugated or non-woven.

**Specifications**
- Fast sampling rate for static: 500 samples/sec
- Test speed 5.0-50.8 cm/min (2.0-20.0 in/min)
- NEW easy loading magnetic clip sled
- Test results saved to USB storage device or printer
- Interchangeable load cells: 5N, 10N, 20N, 50N and 100N
- Meets ASTM D 1894, ISO 8295 COF-Plastic Films
- Meets TAPPI T594 Paper, TAPPI T 549 Corrugated
- Compatible with GraphMaster curve analysis

The 32-91 Lab Master® Static/Dynamic Friction Tester with Elevator System is designed to precisely determine the friction characteristics of a variety of materials. The instrument removes operator variability from the test procedure with specially designed features to control the sled placement contact rate, orientation/angle, dwell time and lifting the sled after the measurement.

**Specifications**
- Integrated PC running Windows™-based software
- User selectable test speed, delay time, and test distance
- Units are displayed in gram force or COF
- Ability to create user-defined test profiles with built-in ASTM, ISO and TAPPI methods
- Individual test speed selection for both static and kinetic COF
- High-speed data acquisition system accurately locates and captures the static peak
- Computer controlled elevator system lowers and raises the sled at a repeatable rate
- Speed range: .4 to 20 in/min (1 to 50.8 cm/min)
Model RR/FT provides accurate, repeatable test results for Static and Dynamic Friction co-efficient values. The load cell measuring range is 1 kg. Applications include COF and peel for any combination of packaging materials using a standard test sled or specific peel attachment. Ray-Ran Friction tester includes Windows™-based Techni-Test software which allows user-defined test data to automatically download to the apparatus for report information and for the operator to analyze all aspects of the friction test curve.

Specifications
- 1 kg load cell
- Touch membrane keypad
- Easy to read liquid crystal display,
- Ethernet interface connector for LAN Networking
- Tabular and graphical statistical analysis
- Temperature display for heated bed option
- Variable speed sled velocity up to 1800 mm/min
- Standards include: ASTM D 1894, ISO 8295 COF-Plastic Films, TAPPI T594 Paper, TAPPI T 549 Corrugated

Model 43-26-27 Falling Dart Impact Tester determines the mechanical puncture resistance of packaging materials such as plastic films and laminates according to ASTM D 1709 methods A and B. These methods cover the determination of the energy that causes polyethylene film to fail under specified conditions of impact of a free-falling dart.

The dart consists of a hemispherical part of aluminum with polished surface and a diameter of 38.1 mm (1.5 in.), having a vertical shaft in the center of the flat top surface. Around the shaft additional weights can be fitted. The base includes a test clamp to secure the film.

Specifications
- Drop height 660 mm for ASTM D-1709 method A
- Drop height 1500 mm for ASTM D-1709 method B
- Weight of falling dart-50 gr.
- Additional weights:
  - 10 pcs of 5 gr
  - 8 pcs of 15 gr
  - 8 pcs of 30 gr
  - 8 pcs of 60 gr

The Ray-Ran Model RR/FDT-A Dart Drop tester complies with the ASTM D1709 Method A & B. The apparatus uses photo electric cells to measure the energy (joules) to break or cause failure to the sample being tested. Manual testing usually requires over sixty drops for each sample to get a good result.

The dart release mechanism is solenoid actuated for easy release and requires the use of both hands to release the dart to ensure optimum operator safety. Test specimens are simply clamped in the unique two-piece pneumatic clamp system which gives a constant tension across the surface area of the specimen ensuring test repeatability.*

Specifications
- Advanced dedicated microprocessor control,
- Touch membrane Alpha/Numeric keypad
- Easy to read liquid crystal display
- Variable Drop height adjustment as standard 660 mm-1500mm
- Techni-Test is the easy-to-use, standard software
- Solenoid actuated dart release mechanism with audible pre-warning

* A manual version is also available, Model 43-61-00-001.
The Ray-Ran Unrestrained Linear Thermal Film Shrinkage apparatus, also referred to as the liquid immersion method, is used to determine thermal shrinkage of plastic film and sheeting. As a result of manufacturing, internal stresses may be locked into a film or sheet which can then be released by heat, causing shrinkage of the material. The amount of shrinkage is dependent upon the temperature during the test. The results are plotted on a graph showing percentage shrinkage against temperature.

**Specifications**
- Determination of Unrestrained Film Shrinkage
- Liquid immersion method
- Simple to operate
- PID electronic temperature control
- Resolution 0.1°C
- PT100 PRT sensor accurate to 0.1°C
- Integrated stirrer motor
- Stainless steel liquid bath
- Sample cutting template, 100mm x 100mm

The Model 49-56 Digital Micrometer combines unmatched accuracy and resolution, a robust mechanical design and improved electronics, including a digital linear encoder. The unit has a measurement range of 0-10.0000 mm (0-10,000.0 um), 0-394.000 mil. Designed for thickness measurements of sheet materials, the 49-56 can be configured to meet ISO, ASTM, EDANA or other specifications for paper, corrugated, plastics, plastic film, tissue paper, nonwovens, textiles and other sheet-like substrates.

**Specifications**
- Easy-to-use
- Small foot print
- Low foot pressure capabilities
- Units include, mm, μm, mil
- Optional strip feeder
- Suitable for multiple material applications
- Computer compatible with GraphMaster™ software
- Meets standards ASTM F 2251, ASTM D 6988, ISO 4593
The NEW model 49-86 Digital Micrometer combines a precision digital linear encoder measuring system with an ultra-clear, easy-to-read digital display. The unit is designed for very thin materials such as plastic films, paper, non-woven textiles, and non-woven board and battery separators. The motor-driven instrument utilizes the dead weight micrometer principle for high accuracy and repeatability. Construction consists of a heavy, solid frame which supports the unit and houses the reflective linear encoder and associated circuitry. A digital readout is provided to automatically display the specimen thickness. The lower anvil and movable pressure foot are made from lapped, stainless steel.

**Specifications**
- Measurement range: 0-0.050 in. (0-1.27 mm)
- Range: 0-0.050 in. (0-1.27 mm)
- Resolution: 0.5 micron (0.02 mil)
- Accuracy: 1.0 micron (0.039 mil)
- Units: Microns, mils, millimeters or inches
- Dwell time: 100 ms - 6 sec
- Meets standards ASTM F 2251, ASTM D 6988, ISO 4593

The Model 68-76 Pocket Goniometer PGX+, from FIBRO System AB, is an electronic, video-based, contact-angle goniometer designed for quality control applications. To perform a measurement, simply place the portable instrument directly on the specimen and press “start.” No sample cutting or preparation is required, saving set up time and eliminating the need for sample manipulation.

**Specifications**
- Small size: 90 (L) x 55 (W) x 90 (H) mm
- Integrated camera captures 80 images/sec (640x480 pixels)
- Built-in pump - delivers precise droplets in 0.5 μl steps
- Automatic Droplet Application - Static and Dynamic Mode
- Runs on most PC & Laptops (USB)
- Easy to install – no computer hardware!
- Complies with TAPPI T458, ASTM D-724, ASTM D-5946

The PG Dosing Unit is a stand-alone pump used in unison with the PGX+ to measure contact angle. When tacky liquids or many different liquids are being tested, it is necessary to clean or replace the liquid system to avoid contamination. With the PG Dosing Unit, disposable syringes are an attractive alternative to tedious cleaning and replacement of expensive parts, saving time, effort and expense.

**Specifications**
- Based on a standard syringe pump for low-cost disposable syringes
- Unit can be operated in several modes: Standard method is to set the pump to a preset droplet volume and pump out a new droplet for each new test position
The Ray-Ran Advanced Universal Pendulum Impact Tester with Puncture head has been designed to measure impact-puncture resistance of a film, brittle or ductile plastic sheet. This method is suitable for plastic or packaging materials having a puncture impact strength which exceeds the capacity of typical Drop Dart or Spencer Impact specimens. The result is the energy necessary to burst or penetrate the center of a plastic specimen mounted between two circular plates.

Test material is clamped between the plates and secured by a rubber “o” ring. Using different impact Tup Strikers, the energy measured at failure can be analyzed to allow direct comparisons with other materials and produce in-house quality control standards, or to simulate actual service conditions.

**Specifications**
- Advanced dedicated microprocessor control
- Touch membrane Alpha/Numeric keypad
- Easy to read liquid crystal display
- RS232 interface connector
- 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 25 Joules
- Results in KJ/M and KJ/M²

The SL-10 Hot Tack Tester & Seal Tester is the most precise and consistent heat seal tester in the packaging industry. Testing capabilities include heat sealing, heat-seal testing and hot-tack testing. The SL-10 provides the critical information needed to determine ideal sealing conditions for packaging films.

**Specifications**
- Direct-touch color screen
- Computer controlled pressure, temperature and dwell time
- Ethernet port, printer port, 2 USB ports, PS/2 keyboard port, VGA monitor port
- Independent upper and lower sealing temperatures
- Dual-load cells for consistent sealing surface pressure
- Safety guards and switches for safe operation
- Measures actual dwell time on the sealing sample
- Meets Standards ASTM F 1921, F 2029

The SL-2 Digital Heat Sealer is a precision heat sealer designed to duplicate heated crimp seals for the flexible packaging industry. The digitally controlled heat sealer allows for independent upper and lower seal jaw temperature. The controlled temperature is assured to ± 1.1°C (± 2°F) across the entire width of the film sample. The dwell timer is switch-controlled to insure actual dwell time on the seal specimen.

The SL-2 Digital Heat Sealer insures sealing consistency for each sample and allows the operator to duplicate and analyze sealing applications in flexible packaging.

**Specifications**
- Digitally controlled temperature and dwell time
- Independent upper/lower sealing temperatures
- Measures actual dwell time on sealing sample
- Sealing temperature range from ambient to 400°C (752 °F)
- Footswitch
- Safety guards and switches for safe operation
- Meets standard ASTM F- 2029
The TS-4 Heat Sealer

The TS-4 is a Laboratory Heat Seal Tester used to prepare heat seal samples for the measurement of sealing strength of flexible packaging films, film foil laminates, nonwovens and other substrates. The TS-4 Heat Seal tester produces consistent and accurate seals utilizing a precision load cell system which measures and displays the total force applied to the film sample. An integrated Digital Electronic Controller displays sealing force, load tare functionality, and dual selectable timer set points. The TS-4 also features interchangeable seal jaws.

Specifications
- Digitally controlled temperature
- Digitally controlled dwell time
- Independent upper/lower sealing temperatures
- Footswitch
- Safety guards and switches for safe operation
- Digital seal pressure output display
- Switch selectable dual set points for timer activation
- Meets standard ASTM F-2029

The TS-12 Heat Sealer

The TS-12 is one of the most precise and consistent table top sealers available. It is designed to produce heated crimp seals for flexible packaging materials. The digitally controlled heat sealer allows independent upper and lower seal jaw temperature and accurately controls the temperature across the entire length of the seal. The seal pressure is changed by simply adjusting the analog gauge which controls the cylinder pressure. The TS-12 ensures sealing consistency for each sample and allows for seal testing, sample package development or small production sealing.

Specifications
- Digitally controlled temperature
- Digitally controlled dwell time
- Independent upper/lower sealing temperatures
- Footswitch
- Safety guards and switches for safe operation
- Auto Cycle switch allows continuous cycling of sealing jaws for quick sample sealing
- Meets standard ASTM F-2029

Bending Resistance Tester

Model 79-25 is a user-friendly, microprocessor controlled instrument to determine the bending resistance of paper, paperboard, plastic film, medical tubing and wire. Bending stiffness is a property associated with the rigidity of a material. Our Bending Tester was developed to produce a more concise, consistent measurement for the paper industry and is now used in personal products, paper, flexible films, packaging and non-wovens.

Specifications
- Direct sample to load cell contact for accurate measurement
- Easy selection of test parameters from a comprehensive range through a setup menu
- Motorized test length setting
- Pneumatic clamps with fast release provide consistent clamping pressures for fast, repeatable results
- Large, clear display showing peak value and angle
- Load cells are fitted with overload protection
Tear testing measures the force required to continue the tearing of an initial cut in sheet materials. Models and weights are available to test material with a variety of strengths.

Also known as the Elmendorf test, this test has been performed in the paper industry for more than half a century to measure the mean internal resistance of cellulose or papers to the propagation of a deliberate tear.

The Automated Elmendorf Tear Tester is a Messmer Büchel product.

**Specifications**
- Automatic specimen notching
- Mechanical-pneumatic clamping avoids sample slippage to ensure repeatable results
- Automatic pendulum reset with lifting device
- Tearing force displayed digitally
- RS-232 data output
- Maintaining a uniform quality level
- Safety hood protects operator from injury
- Meets standards ASTM D 1922, ISO 6383

An automated tear tester equipped with an optical encoder for measuring the angular position of the pendulum during tearing and converting this measurement to tear units. A full-color touchscreen display with intuitive, easy-to-use software provides a revolutionary approach to testing and data review.

Elmendorf Tear testing determines the force required to continue the tearing of an initial cut in sheet materials such as paper, plastic film and textiles.

**Specifications**
- 7" full-color digital touchscreen display
- Storage and editing of up to 200 readings
- Universal pendulum with interchangeable weights
- Pneumatic clamps and pendulum release
- Automatic calibration of pendulum
- Multiple data export options: USB flash drive, USB ESC/POS printer, RS232 and GraphMaster™ software
- Calculates force of multiple plies
- Meets standards ASTM D 1922, ISO 6383

A fully digital tensile testing system with precise control and accuracy. It includes automated computer control of test methods using high resolution auto-ranging load cells with accuracies better than +/-0.5% down to 1/1000th of the load cell capacity for accuracy and simplicity of operation.

**Specifications**
- Aluminum alloy load frame provides high strength and stiffness
- Fully digital testing system with precise control and accuracy, includes automated computer control of test methods to simplify operation
- High resolution auto-ranging load cells with accuracies better than +/-0.5% down to 1/1000th of the load cell capacity
- Automatic recognition and calibration of load cells and extensometers with instant calibration check facility
- 800% overload capability of load cells without damage
- Compact footprint to economize on bench and floor space
The 6MPCA is the most advanced digital model offered within the Ray-Ran range of melt flow index testers. The operating procedure is simple to undertake using its on-board advanced microprocessor technology. The large LCD provides onscreen instructions, reducing user error, and test parameters are easily entered via the keypad. The apparatus can accurately determine results for MFR, MVR and Density at test temperature.

**Specifications**
- Molten polymer extrusion via controlled orifice using set temperature and pressure parameters
- Electronic temperature controller with dual zone heating
- Temperature accurate to +/- 0.1 °C, range 0 to 400°C and resolution +/- 0.1 °C
- Digital encoder accurate to +/- 0.02mm
- Conforms to ASTM D1238, ASTM D3364, ISO 1133, DIN 53735 and others
- Electrical characteristics: 110v@60hz and 220v@50hz - fuse rating: 10amp

For more info on our rigid plastics instruments, contact Testing Machines, Inc. at (800) 678-3221, or visit www.testingmachines.com
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21-25-02-0001
3 or 6 Column Auto Density Measurement System

The Auto Density Gradient Column System is available in either a 3 column unit or 6 column unit. According to ASTM D1505, column gradient measurement systems are the world’s benchmark for accurate density measurement of small polymer specimens. The built in, on-board Microprocessor System accurately calculates the specimen’s density more quickly and more accurately by using the latest linear encoder technology that measures the samples position in the column relative to the calibrated glass marker floats. Once the correct position of the sample is recorded the density is displayed on the LCD screen.

Specifications
- Automatic density calculation
- Automatic calibration system
- Resolution 0.0001 g/ml
- Accuracy 0.0001 g/ml
- Variable speed pumped filling system
- Twin conical filling flasks
- Automatic magnetic stirrer
- 7x optical microscope

21-25-03-0001
Microprocessor Controlled Density Gradient Filling System

The Density Gradient Column Filler is by far the most accurate way of producing a density gradient within your column. It integrates effortlessly with the Ray-Ran 3 and 6 column systems. It also saves considerable time in the preparation and building of your density gradient and overcomes a lot of the trial and error that is associated with this procedure.

Specifications
- Small footprint filler unit with basic operating panel and LCD display
- Fully programmable column volume and upper/lower densities
- Microprocessor provides more accurate and consistent control than other filling methods
- Variable speed pumped filling system
- No need to premix liquids
- Measurement units: g/ml or kg/m3
- Variable top and bottom buffer volumes
- Automatic density calculation

21-10
Automatic Densimeter DSG-1

The 21-10 Automatic Densimeter DSG-1 is a high precision instrument for measuring specific gravity that offers accurate, simple operation in almost any laboratory environment. An electronic balance determines specific gravity of rubber, plastic, ceramic and other materials with the push of a button. Specific gravity of the sample can be directly and easily read on the indicator screen.

An optional attachment allows measurement of the specific gravity of liquids or the rate of change of volume for plastics, rubber and other materials.

Specifications
- Measurement range 0-100 gram with resolution to 0.0001g (0.1mg)
- Specific gravity minimum display 0.000001
- Measures specific gravity of a range of materials
- Only 20 seconds required to measure a sample
- Simple operation - mount sample, push start button, dismount sample
- Standards include Plastics - ISO 1183, ASTM D 792, Rubber- ASTM D 297
Instruments For Rigid Plastics

21-30-00-0001  Density Determination Kit for Solids

The Adventurer Pro Analytical Series Density Determination Balance has established itself as one of the industry’s most versatile balances. The compact Adventurer Pro is an essential, cost effective tool for Laboratory and Quality Control environments that features, among other things, a metal base with ABS shell and an ABS top housing. The Adventurer Pro determines the density of fluids and the specific gravity of solid materials by using the Archimedeans Buoyancy Method.

Specifications
- Weighing Capacity up to 260g
- Repeatability 0.000001g/ml
- Readability 0.000001g/ml
- 2-Line LCD display with Backlight
- RS232 with GLP/GMP Data Output
- Rigid Metal/ABS construction
- Glass draft-shield with flip top door
- Multiple Application Modes
- Selectable Environmental Settings

22-70-00-0001  Test Sample Injection Moulding Apparatus

The Test Sample Injection Moulding Apparatus has been specifically designed to produce a wide variety of laboratory test samples such as color plaques, tensile and impact test specimens as well as small components required for mechanical testing procedures. The unique low cost moulding machine has a compact design for vertical bench mounting making the apparatus ideal for Research and Development Institutes, universities, laboratories and workshops.

Specifications
- Pneumatically operated
- Maximum air line pressure: 150 psi/10 bar
- Maximum polymer pressure: 6500 psi/450 bar
- Maximum shot size: 47cm³
- Max. sample size 175mm (L) x 45 (W) x 12.7 (T)
- Digital Temperature Control
- Automatic nozzle-to-tool locking device.
- Cam-lock Tool Block
- Quick Change Cylinder, Nozzle & Die

22-70-01-0001  Hand Operated Test Sample Cutting Press

Specifically designed to cut test samples such as tensile bars from relatively flexible sheet, the Ray-Ran Hand Operated Test Sample Cutting Press will produce samples from plastics, fabrics, boards and paper. In most cases, the thickness of the material that can be cut will not just depend on the strength of the material, but also on the lateral flexibility of the material to allow the cutter to penetrate down into, and pass through the material.

Specifications
- Hand operated
- 30cm x 15cm sample platform
- Cutting force up to 6KN
- Polypropylene cutting board
- Adjustable cutting arbor with locking handle
- Suitable for rubber, plastic, paper, fabric or laminates
- Product user manual
- CE declaration certificate
- 1 year return to base warranty
Specifically designed to cut test samples such as tensile bars from relatively flexible sheets, the Ray-Ran Pneumatically Operated Test Sample Cutting Press will produce samples from plastics, fabrics, boards and paper. In most cases, the thickness of the material that can be cut will not just depend on the strength of the material, but also on the lateral flexibility of the material to allow the cutter to penetrate down into, and pass through the material.

Specifications
- Pneumatically operated up to 10 bar (150 psi)
- Automatically operated
- Polycarbonate guard
- Cutting force up to 50KN
- 25cm x 15cm sample platform
- Polypropylene cutting board
- Adjustable cutting arbor with locking handle
- Suitable for rubber, plastic, paper, fabric or laminates
- Product user manual

Designed and manufactured by Ray-Ran the Model 1 CNC Sample Profile Cutter is rapidly becoming the best bench top milling machine in its class. The 3 axis rapid prototyping vertical milling machine is ideal for cutting hard dense polymer sheets and laminates up to 40mm thick as well as polyethylene and polypropylene pipes that are used within the gas and water industry.

Specifications
- 300mm x 250mm x 100mm XYZ axis
- 500 mm x 440 mm table size
- High Quality 0.5KW Router Spindle
- Variable spindle speeds from 2400 rpm to 24,000 rpm
- High quality guide rail and lead screw system
- Positional homing switches
- Enclosed safety cabinet for user protection
- Internal lighting
- Computer interface with Windows™ Flashcut CNC PC software

The Model 2 CNC Sample Profile Cutter designed and manufactured by Ray-Ran is the ultimate bench top 3 axis vertical milling machine used for Test Sample Preparation and 3D rapid prototyping.

Specifications
- 600mm x 300mm x 175mm XYZ axis
- 910 mm x 480 mm table size
- High Quality 1.5KW Router Spindle
- Variable spindle speeds from 2400 rpm to 24,000 rpm
- High quality guide rail and lead screw system
- Positional homing switches
- Enclosed safety cabinet for user protection
- Internal lighting
- Emergency Stop Button
- Computer interface with cabling and Windows™ Flashcut CNC PC software
- Low cost CNC programs available for any international test standard
- 220-240 volts 1 ph 50 Hz
### Instruments For Rigid Plastics

#### Notching Cutter
To produce precise stress concentrated notch profiles on Impact and Charpy specimens look no further than the Ray-Ran Autocycle Notch Cutter for Izod and Charpy Impact Tester Sample preparation. A world leader by design, this machine will cut accurate notch profiles to international test standards such as ISO 179, ISO 180 and ASTM D256 on impact machines from TMI, Ray-Ran, and other impact tester manufacturers. **Specifications**
- Advanced dedicated microprocessor control
- Easy to read LCD
- Touch membrane keypad
- Memory feature
- Cutter speed range from 350 rpm to 2500 rpm
- Traverse speed range 0.06 mm/rev to 1.0 mm/rev
- Metric and imperial traverse speeds units
- Anti-vibration linear motion slide
- Multi-sample loading
- Cutter wheel 0.25mm radius included

#### Bulk Density Apparatus (ASTM D1895 Method A)
Bulk density apparatus is testing equipment used to measure the bulk density property of powder, granules and other “divided” solids, especially used in reference to mineral components (soil, gravel, sand), chemical substances, (pharmaceutical), plastics like polyethylene (hdpe or mdpe) pvc, polystyrene etc, or foodstuff and any other masses of granular or particulate matter.

The Method A tester is primarily used to measure the apparent density of fine granules that can be poured readily through a “V” shaped funnel, the material under test is allowed to flow into a cylindrical cup with a known volume of 100cm³. **Specifications**
- V shaped funnel
- Measuring cup 100cm³
- Stand with funnel shut off
- Special funnels and cups are available to meet your requirements
**Tests that can be conducted are:**
- Apparent Density
- Bulk Factor
- Pourability

#### Bulk Density Apparatus (ASTM D1895 Method B)
The larger of the ASTM family Method B is primarily used to measurement of the apparent density of larger coarse granular materials, dice or pellets that cannot be poured readily through the method A funnel. The material under test is allowed to flow into a cylindrical cup with a known volume of 400cm³. **Specifications**
- V shaped funnel
- Measuring cup 400cm³
- Stand with funnel shut off
- Special funnels and cups are available to meet your requirements
**Tests that can be conducted are:**
- Apparent Density
- Bulk Factor
- Pourability
For coarse flakes, strands, chips and cut fibers that cannot be poured using test methods A and B, Ray-Ran offer a measuring cylinder and plunger to method C of the ASTM test standard. Since these types of materials to be tested are very bulky when loosely poured and are usually compressed to lessen the bulk, a measure of their density under a small compression load is very useful. For this test a measuring cylinder of 1000 cm³ is supplied along with a scaled weight plunger with 1 mm graduations on the outside. Lead shot is used to increase the plunger weight to 2300g to compress the material under test.

**Specifications**
- Measuring funnel
- Weight plunger
- Lead shot
- Special funnels and cups are available to meet your requirements

**Tests that can be conducted are:**
- Apparent Density
- Bulk Factor
- Pourability

Primarily used to measure the apparent density of moulding material that can be poured readily through a specified funnel, the material under test is allowed to flow into a cylindrical cup with a known volume of 100 cm³.

**Specifications**
- Measuring cup 100 cm³
- Stand with funnel shut off

**Tests that can be conducted are:**
- Apparent Density
- Bulk Factor
- Pourability

The new 43-76 Pendulum Impact Tester uses a high resolution optical encoder and advanced data acquisition software to determine the impact resistance of rigid materials like plastic in accordance with a variety of ASTM and ISO test standards for Izod, Charpy, Chip Impact and Un-Notched Cantilever Beam testing.

**Specifications**
- Pneumatic clamp for superior repeatability
- Data export options: USB flash drive, USB ESC/POS printer, RS232, GraphMaster™ software
- Tool-less quick change hammers, swappable weights with ranges
- 7" digital touchscreen display
- Polycarbonate safety shield
- Optimized center of percussion minimizes hammer vibration
- Pneumatic hammer release and automatic brake
- Supports classification of specimens according to failure category
- Meets ASTM D256, ISO 180 for Izod; ASTM D6110, ISO 179 for Charpy; ASTM D4508 for Chip Impact; ASTM D4812 for Un-Notched Cantilever Beam
The Ray-Ran Advanced Universal Pendulum Impact Tester utilises advanced microprocessor technology to determine the energy required to break or rupture 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 exceed all of your testing requirements.

Specifications
- 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
- Variable pendulum velocity up to 3.8 m/s

Designed and built with operator simplicity in mind, the Ray-Ran Universal Falling Weight Impact Tester for Pipes up to 500 mm dia is the best in its class. It is used to determine the energy required to break or rupture test specimens such as pipe, sheet, laminates, composites, ceramics and non ferrous metals for material and component evaluation to international testing methods such as ISO6603, ISO3127 and ASTM D2444, to name a few. It can be configured to test larger pipe diameters, have different drop heights, and test flat sheet as well as sectional moldings.

Specifications
- 2 meter drop height test machine
- Twin guide rail system
- Low friction carrier bearing system
- Solenoid release mechanism
- Pneumatic carrier return
- Mechanical raise/lower fixture platform
- Pipe, sheet, Izod, Charpy, Tension, Component compatible – up to 500 mm in diameter
- Variable velocity up to 6.26 m/s
- Impact energies up to 314 Joules

Designed and built to cover multiple international testing standards, the Ray-Ran Advanced HDT/Vicat Apparatus utilises microprocessor technology to accurately determine the deflection and softening point characteristics of all thermo plastic test specimens.

Specifications
- HDT/Vicat testing enabled
- Manual Raise/Lower of test stations
- Advanced microprocessor control
- 2 sample test stations
- Digital temperature control
- Temperature range to 300°C
- Oil bath stirrer
- Solenoid operated cooling system
- Integrated safety thermostat
- HDT Heads (1 per station)
- Vicat Nibs (1 per station)
For more info on our rigid plastics instruments, contact Testing Machines, Inc. at (800) 678-3221, or visit www.testingmachines.com

**46-03-00-0002**

Advanced 4 Station HDT/Vicat Softening Point Apparatus

- Designed and built to cover multiple international testing standards, the Ray-Ran Advanced HDT/Vicat Apparatus utilises microprocessor technology to accurately determine the deflection and softening point characteristics of all thermo plastic test specimens.

**Specifications**
- HDT/Vicat testing enabled
- Manual Raise/Lower of test stations
- Advanced microprocessor control
- 4 sample test stations
- Digital temperature control
- Temperature range to 300°C
- Oil bath stirrer
- Solenoid operated cooling system
- Integrated safety thermostat
- HDT Heads (1 per station)
- Vicat Nibs (1 per station)
- Standard Fiber Stress 0.45, 1.8 or 8.00 MPa
- Temperature resolution +/- 0.1°C
- Temperatures above 250°C require Nitrogen blanket

**46-03-00-0003**

6 Advanced Station HDT/Vicat Softening Point Apparatus

- **Software and hard copy printer included**

For maximum testing capability, choose the Ray-Ran Advanced 6 Station HDT/Vicat Apparatus. Built for multiple simultaneous testing of 6 samples to HDT or Vicat testing methods, the apparatus uses dedicated microprocessor technology to accurately determine the deflection and softening point characteristics of all thermo plastic test specimens. Its simplicity and accuracy makes the apparatus ideal for product development and quality control. It has been designed to meet multiple International Testing Standards.

**Specifications**
- HDT/Vicat testing enabled
- Advanced microprocessor control
- Power rise and fall of test stations
- Dual pump stirrer system
- 6 sample test stations
- Digital temperature control
- Temperature range to 300°C
- Solenoid operated cooling system
- HDT Heads, Vicat Nibs (1 each per station)
- Temperatures above 250°C – Nitrogen blanket

**46-04-00-0001**

6 Cell Thermal Ageing Apparatus

- The 6 Cell Thermal Ageing Apparatus has been designed by Ray-Ran to study the thermal endurance characteristics of polymer materials and their ageing process by passing a constant flow of heated air over individual test samples. At set time intervals, the test samples are removed and inspected for any deterioration or degradation, making the apparatus ideal for research and development labs and product design. Designed in accordance with BS 903, BS 6746, BS 5691 and ASTM E95 international test standards, the apparatus is extremely cost effective and very simple to use.

**Specifications**
- Integrated oil bath
- Dual pump stirrer system
- Digital temperature control
- Oil tank capacity – 30 litres
- 6 off Individual stainless steel test cells
- Test sample holders
- 50-500 cm³/min glass flow meter
- Output flow rate meter
- 6 way switchable temperature indicator
Designed and built by Ray-Ran, the Cold Flex Tester determines how low temperatures affect the torsional stiffness properties of flexible materials, including polyvinyl chloride extrusion compounds, by measuring the temperature at which a test specimen is twisted through a known angular displacement using a pulley system by a specified torque. The apparatus complies with BS2782: Part 1: Method 104B, ISO458/1, 458/2 and ASTM D1043 International Test Standards.

**Specifications**
- Measures apparent torsional modulus of elasticity
- Integrated low temperature bath
- PID electronic temperature control
- Resolution 0.1°C
- PT100 PRT sensor accurate to 0.1°C
- Integrated stirrer motor
- Stainless steel clamping mechanism
- Low friction bearing assembly
- Integrated radial dial indicator (degrees)

The model 17-77 Top Load Compression Tester meets international standards and corporate testing methods for compression strength requirements for a variety of materials and products. A new enhanced microprocessor design with servo motor provides precision force and position control for repeatable instrument performance.

The performance of a container in production and transit is critical. Product failures during filling, packaging, warehousing and shipping are costly and can easily be prevented when containers and finished goods are tested for top-load strength.

**Specifications**
- Maximum Capacity 2000 LB (8896 N)
- Selection of load cell ranges to max capacity
- Platen size 13 x 13 in (330 x 330 mm)
- Adjustable pre-load before start of measurement
- Variable test speed
- Auto return to pre-set start distance
- Automatic fast return platen saves testing time

The 10kN is a two-column, Universal tester that can be programmed with up to 100 different test methods. These tests range from the most basic to the most sophisticated machine control, all with full graphics and statistical display. They are ideal solutions to testing problems where there is a need for precise, efficient and consistent performance. Applications include Plastics, Cord, Textiles, Food, Rubber, Nonwovens, Packaging, Adhesives, Wire, Wood Products, Composites, Adhesives and Metals.

**Specifications**
- Fully digital testing system with high precision control and accuracy, includes automated computer control of test methods for easy operation.
- High resolution auto ranging load cells with accuracies better than +/-0.5% down to 1/1000th of the load cell capacity.
- Automatic recognition and calibration of load cells and extensometers, with instant calibration check facility.
Unparalleled After-Sales Support

Sales, Calibration, Installation And Service Support

Total commitment to customer satisfaction begins with excellent customer support. Our technical support staff around the world offers specialized set-up and training, service, calibration services and expert telephone assistance.

Field installation and service can be utilized for testing equipment from Testing Machines, Inc., Messmer Büchel, Ray-Ran and FIBRO System, as well as many other manufacturers.

Find out how we can help minimize service interruptions and maximize your machine’s efficiency by contacting our global locations.

For more info on our Sales, Calibration, Installation and Service Support contact Testing Machines, Inc. at (800) 678-3221, or visit www.testingmachines.com
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Testing Machines Inc. Field Service Department is accredited to ISO/IEC 17025-2005 by the American Association for Laboratory Accreditation (A2LA).
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