Industry leading plastics testing equipment

INDUSTRIAL PHYSICS

Protecting
Product Integrity

Who are we

We've been designing and building machines to test plastics and polymers for several decades.

Over the years our engineers have manufactured many popular devices that are famous for their accuracy and reliability. Brands in the Industrial Physics family – including Ray-Ran, Testing Machines Inc. and United Testing Systems – are now synonymous with quality test and inspection solutions.

For polymer based products, from packaging through to automotive components, we offer testing instruments using the latest advances in technology to ensure that your products meet stringent international quality standards, from ASTM, ISO and many other standards bodies.

Our innovative devices support all types of plastic testing requirements, including methods to evaluate the properties of recycled materials. Each of our systems offer a quick and efficient testing solution that ensures reproducibility and repeatability.

If you're looking for increased productivity and less hassle, you'll love the capabilities of the innovative devices in this brochure.

Industrial Physics combines the strength of 12+ of the world's leading inspection brands. When you choose us as your test and inspection partner, you'll get access to an unrivalled product portfolio and breadth of knowledge that you won't find anywhere else. We also offer first-rate training, post-sales support and servicing packages suitable for the precise needs of your business.

No matter the size or location of your organization – we're here to safeguard your reputation.

Our brands

Across our portfolio of specialist brands, we've been protecting the integrity of businesses all over the world, for more than a century.

Ray-Ran | TMI | UNITED TESTING SYSTEMS

About Industrial Physics

Innovative Technology

Testing & Inspection in...

15 Industries
40 Applications
22 Materials

20,000+ Customers

Over **300 People**

Customers in **75 Countries**

12+ Brands

Global Service **& Distribution** Network

Plastic and polymer testing expertise

If you need to test the performance of your plastics and polymers, we have the best instruments for the job.

Our innovative products put your raw sample materials and finished components through their paces. They give you highly accurate and repeatable results.

Maximise the capability of your quality testing processes with an Industrial Physics universal test frame. You can inspect just about any plastic material, from any industry, using our operator-independent technologies. Plus, our experts are on hand with service support from local technical experts...all over the world.

If you work with recycled plastics, a rigorous plan of quality testing procedures is critical. As we move from a single use to a fully circular economy, we can help you to bring more of your testing in-house. Giving you complete confidence in your innovative sustainable recycling solutions.

Choose industrial Physics for innovative, cost-effective devices that give precise results in:

- Abrasion testing
- Adhesion testing
- Coating testing
- Coefficient of friction (CoF)
- Compression testing
- Creep to fail testing
- Flexibility testing
- Headspace analysis
- Impact testing
- Permeation testing
- Strength testing
- Tear testing
- Tensile testing
- Thickness testing
- Heat distortion testing
- Softening point testing
- Thermal shrinkage testing
- Melt Flow Testing
- Density Testing
- Moisture Analysis
- Puncture Testing
- Burst Testing

Meet our plastics testing product range

Get the highly accurate, reliable results you need with our purpose-built testing machines for flexible and rigid plastics.

Flexible packaging instruments

The Ray-Ran Micro Cutting Machine (RR-MCM)

The RR-MCM is a popular film cutter that effortlessly cuts through flexible packaging, film and foils up to 250µm (0.25mm) thick. It's ideal for making rectangular strips for use in tensile and tear testing to meet most international standards.

Selected features and benefits:

- Interchangeable cutter heads made for your business
- Hardened and ground guide rail system
- Minimum sample width 250µm (0.25mm)
- Linear roller bearing guides
- Easy to operate

The Ray-Ran Microprocessor Melt Flow System (RR-MFR300)

A perfect partner for your QA, QC and R&D requirements – the MFR300 verifies and validates sample materials. It's highly accurate and easy to use with touch screen electronics and the latest in on-board microprocessor technology.

Selected features and benefits::

- Windows based Techni-Test™ software included as standard
- Multi datapoint capture for accurate flow curve analysis
- Replaceable hardened steel cylinder liner as standard with optional Hastelloy variant available
- USD, Ethernet and flashdrive connectivity
- Wi-Fi enabled for remote results access
- Completes all testing required for Standard Procedures A, B, C & D
- Auto cut-off device as standard

The TMI Static and Dynamic Friction Tester

Need accurate, repeatable results for static and dynamic friction coefficient testing? Look no further! This innovative device has multiple load cell options available. It's perfect for coefficient of friction and peel testing for any combination of packaging materials, to most quality standards.

It comes with powerful GraphMaster software included. Enabling user-defined test data that's automatically downloadable for report information. Giving you instant, accurate analysis of all aspects of the friction test curve.

Selected features and benefits:

- Ethernet interface connector for LAN Networking
- Temperature display for heated bed option
- Tabular and graphical statistical analysis
- Easy to read liquid crystal display
- Touch membrane keypad

The Ray-Ran Manual Advanced Falling Dart Impact Tester (RR-FDT-MA)

When you're checking the **initial energy** required for flexible materials such as plastic film, paper and composite sheets to fail, look no further than the Ray-Ran range of Falling Dart Impact Testers.

Several models are available in the range. This microprocessor controlled set-up from Ray-Ran is built for accuracy and simplicity, with operator security in mind and complies with the ASTM D1709 Method A & B and ISO7765 part 1. Simply add or remove known weights to determine the initial failure of the sample.

Selected features and benefits:

- LCD display with soft-touch keys
- Techni-test software with tabular and graphical results presentation
- Unique constant tension sample clamping
- 'Two-hand' safety operation
- Low maintenance
- Bench mounted
- Mini USB and Ethernet connectivity
- Pneumatically Operated
- Darts available in a range of materials

The Ray-Ran FD-A1 Advanced Floor Mounted Falling Dart Tester (RR-FDT-A1 and RR-FDT-A2)

The powerful microprocessor technology of this innovative testing machine has taken falling dart testing machines to a new level. It's easy to operate and highly accurate – making it ideal for product development and quality control.

The **total energy** that causes failure of thin flexible materials such as plastic film, paper and composite sheets to fail has never been easier to establish.

The FD-A1 uses photoelectric cells to measure the joules needed to break your sample by measuring the kinetic energy lost by the dart.

Selected features and benefits:

- Unique constant tension sample clamping
- Safety engineered clamp and dart release
- Conforms to ASTM D4272
- Pneumatically operated
- Floor Mounted

The FD A-2 is ideal for all aspects of product development and quality control. The energy that causes thin flexible materials such as plastic film, paper and composite sheets to fail has never been easier to establish. This apparatus complies with ASTM D1709 Method A & B, ISO 7765 part 1 and ASTM D4272.

Selected features and benefits:

- LCD display with soft-touch keys
- Techni-test software with tabular and graphical results presentation
- Unique constant tension sample clamping
- 'Two-hand' safety operation
- Low maintenance
- Bench mounted
- Mini USB and Ethernet connectivity
- Pneumatically Operated
- Darts available in a range of materials
- Photo electric cell technology
- Telescopic drop height adjustment

The Ray-Ran Linear Thermal Film Shrinkage Tester (RR-FSL)

This cost-effective inspection device uses the liquid immersion method to determine the thermal shrinkage of your plastic films and sheeting.

Manufacturing processes can cause internal stresses to be locked into a film or sheet. They can then be released by heat, causing shrinkage of the material. This high-quality device was designed to ASTM D2732 standards. It uses a temperature bath, tooling accessories and electronic digital temperature control to work out the shrinkage during a test.

Selected features and benefits:

- Effective liquid immersion method
- PID electronic temperature control to 0.1°C
- PT100 PRT sensor accurate to 0.1°C
- Stainless steel liquid bath
- Integrated stirrer motor
- Electronic timer HR:MIN:SEC
- Over-temperature safety device

The Ray-Ran Hot Plate Film Shrinkage Tester (RR-HSFP)

Get precise thermal shrinkage results for your QC testing with this innovative inspection device.

The hot plate principle is similar to the liquid immersion method. Film specimens are heated directly on the plate, resulting in shrinkage that is proportional to the quantity of internal stresses in the material caused by the manufacturing processes. This one is really simple to use, enabling you to determine unrestrained film shrinkage effortlessly.

Selected features and benefits:

- PT100 PRT sensor accurate to 0.1°C
- PID electronic temperature control to 0.1°C
- Electronic timer HR:MIN:SEC
- Sample cover plate
- Resolution 0.1°C

The Ray-Ran Advanced Pendulum Impact System (RR-IMT)

Using advanced microprocessor technology, this accurate and reliable system determines the energy required to break or rupture your plastic or ceramic samples.

Ray-Ran built this versatile machine with operator simplicity in mind and it delivers incisive Izod, Charpy, Tension Impact or Film Puncture testing. Plus, it's great for small diameter pipe testing and component impact tests.

Selected features and benefits:

- Hammer energies up to 50 joules – results in KJ/M and KJ/M²
- Self-calibration procedure for wind and bearing resistance
- LCD display with soft-touch keys
- Variable pendulum velocity up to 3.8 m/s

The TMI Single-Column Universal Testing Machine (84-01)

A fully digital tensile testing system with the precise control and accuracy that your operators will enjoy.

This solid machine incorporates automated test methods with high resolution auto-ranging load cells for accuracies better than +/-0.5%, down to 1/1000th of the load cell capacity.

Selected features and benefits:

- Aluminum alloy load frame provides high strength and stiffness
- Automatic recognition/calibration of load cells/extensometers
- Automatic control of test methods to simplify operation
- 800% overload capability of load cells without damage
- Compact footprint to economize on bench/floor space

Instruments for rigid plastics

The Testing Machines 21-10 Automated Densimeter DSG-1

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

Selected features and benefits:

- Only about 20 seconds required to measure one sample
- Simple operation – mount sample, push start button, dismount sample
- Electronic Control and Digital Outputs

The Ray-Ran Auto Density Measurement System (RR-DGA 1 / RR-DGA 2)

The benchmark for accurate density measurement of small solid specimens using the column method. Built with operator simplicity in mind and available in both three and six column versions. It's ideal for product development and quality control within production, research and development labs and teaching institutions.

The powerful microprocessor system calculates a specimen's density with accuracies as low as 0.0001g/cm^3 and resolution to 6 decimal places. Rapid results are shown clearly on the LCD screen while the column linearity can be checked and shown using our advanced 'Techni-test' software.

Selected features and benefits:

- Automatic density calculation and calibration system
- Twin conical filling flasks with auto magnetic stirrers
- Resolution 0.000001g/cm3 / accuracy 0.0001g/cm^3
- Variable speed-pumped filling system
- 7x optical microscope

The Ray-Ran Microprocessor Controlled Density Gradient Filling System (RR-DGA-CFS)

No hyperbole – this machine offers THE most accurate way of producing a density gradient in your column. It saves you time in the preparation and building of your density gradient and overcomes much of the trial and error often associated with this procedure.

It integrates effortlessly with the Ray-Ran three and six column DGA systems with a fully programmable column volume and upper / lower densities. It offers digital readout of densities to ASTM D1505 and ISO 1183 standards.

Selected features and benefits:

- Small footprint filler unit with touchscreen operation
- Microprocessor provides accurate, consistent results
- Accurate stepper motor controlled filling system
- Automatic density calculation

The Ray-Ran Adventurer Pro Analytical Density Balance (21-30-00-0001)

One of the industry's most versatile balances. The compact Adventurer Pro is an essential, cost-effective tool for laboratory and quality control environments.

It has a metal base with ABS shell and top housing. It works by determining the density of fluids and the specific gravity of solid materials. Achieving this using the Archimedean buoyancy method.

Selected features and benefits:

- Repeatability 0.000001g/ml / readability 0.000001g/ml
- Selectable environmental Settings
- Glass draft-shield with flip top door
- Weighing Capacity up to 260g
- Two-line backlit LCD display

The Ray-Ran Test Sample Injection Moulding Apparatus (RR-TSMP)

Custom designed to produce a wide variety of laboratory test samples such as color plaques, tensile and impact test specimens. As well as the small components required for mechanical testing procedures.

This unique, moulding machine has a compact design for vertical bench mounting. It's the ideal apparatus for research and development institutes, universities, laboratories, and workshops that are looking for cost-effective, in-house sample preparation capabilities.

Selected features and benefits:

- Automatic nozzle-to-tool locking device
- Quick change cylinder, nozzle, and die
- Digital Temperature Control
- Pneumatically operated
- Cam-lock tool block

The Ray-Ran Hand Operated Test Sample Cutting Press (RR-HCP)

When you've got thin and flexible materials to cut into samples such as tensile bars, this simple hand operated press is just what you need. Whether you work with rubber, plastic, paper, fabric or laminates.

Our popular cutters are manufactured from high grade D3 tool steel. This gives you long-lasting, cutting-edge sharpness for repeatable test specimens and accurate test results.

Selected features and benefits:

- Adjustable cutting arbor with locking handle
- 30cm x 15cm sample platform
- Polypropylene cutting board
- Cutting force up to 6KN
- Hand operated

The Ray-Ran Pneumatically Operated Test Sample Cutting Press (RR-PCP)

An effortless, safe way to cut samples for all manner of materials including plastics, rubber, fabrics and paper. It generates an impressive cutting force of up to 50KN to cut materials up to 8mm thick.

The press is robust and compact and doesn't need to be bolted to a worktop. It comes with a cutting base of 30cm x 30cm and a polypropylene cutting board.

Selected features and benefits:

- Pneumatically operated up to 10 bar (150 psi)
- Adjustable cutting arbor with locking handle
- Cutting force up to 50KN
- Automatically operated
- Polycarbonate guard

The Ray-Ran Model 1 CNC Test Sample Profile Cutter (RR-CNC model 1)

Need to prepare test samples or make 3D prototypes from thicker sheet materials or pipe sections? The 'Model 1' is the best bench top milling machine in its class.

It's a three-axis rapid prototyping vertical milling machine, ideal for cutting hard dense polymer sheets and laminates up to 40mm. It makes light work of polyethylene and polypropylene pipes, making it a popular choice for the water and gas industries.

Selected features and benefits:

- Variable spindle speeds from 2400 rpm to 24,000 rpm
- High quality guide rail and lead screw system
- Enclosed safety cabinet for user protection
- High quality router with ER20 type spindle
- Positional homing switches
- Supplied with Flashcut CNC CAM software

The Ray-Ran Model 2 CNC Test Sample Profile Cutter (RR-CNC model 2)

The 'Model 2' is the ultimate bench top 3 axis vertical milling machine for preparing test samples and 3D rapid prototyping.

It's ideal for cutting heavier sheet materials or pipe sections up to 100mm thick and is totally enclosed for operator security. Cutting feed ranges up to 2500mm/min can be achieved for a fast, accurate milling process. And each axis is driven and controlled by advanced stepper motor technology.

Selected features and benefits:

- 600mm x 300mm x 175mm XYZ axis and 910 mm x 480 mm table size
- Variable spindle speeds from 2400 rpm to 24,000 rpm
- High quality guide rail and lead screw system
- High quality router with ER25 type spindle
- Positional homing switches
- Supplied with Flashcut CNC CAM software

The Ray-Ran Auto Cycle Test Sample Notching Cutter (RR-NC)

Looking for a notching cutter to produce precise stress concentrations in Izod and Charpy specimen bars? The search is over.

This industry leading cutting machine creates multiple accurate notch profiles to international test standards such as ISO 179, ISO 180 and ASTM D256 in a matter of seconds. This reliable device uses a custom-built adaptive microprocessor control unit with LCD screen. Which ensures feed and cutter speeds are always selected for optimum performance.

Selected features and benefits:

- Cutter speed range from 350 rpm to 2500 rpm
- Advanced microprocessor control
- Crystal clear LCD display
- Touch membrane keypad
- Multi-sample loading

Ray-Ran Apparent Bulk Density Apparatus

Pour your eyes over our reliable instruments. They're custom-built to measure apparent density, bulk factory and the pourability of plastic materials, such as molding powders.

Bulk density is a property of powders, granules and other 'divided' solids. You'll find it used when referring to mineral components (soil, gravel), chemical substances, (pharmaceutical) ingredients, foodstuff, or any other masses of corpuscular or particulate matter.

We design and manufacture the following best-in-class devices to the most stringent ASTM and ISO standard requirements.

Bulk Density Apparatus – ASTM D1895 Method A (RR-BDA-D1895A)

Our method A tester is perfect for apparent density, bulk factor and pourability testing to ASTM standards. It measures the apparent density of fine granules that can be poured readily through a "V" shaped funnel. The test material is allowed to flow into a cylindrical cup with a known volume of 100cm³.

Selected features and benefits:

- Special funnels and cups available to meet unique requirements
- Includes a stand with funnel shut off
- 100cm³ measuring cup
- V shaped funnel

Bulk Density Apparatus – ASTM D1895 Method B (RR-BDA-D1895B)

Our method B tester is larger in size, making it ideal for measuring the apparent density of coarse granular materials, dice or pellets. The test material is allowed to flow into a cylindrical cup with a known volume of 400cm³.

Selected features and benefits:

- Special funnels and cups available to meet unique requirements
- Includes stand with funnel shut off
- 400cm³ measuring cup
- V shaped funnel

Bulk Density Apparatus – ASTM D1895 Method C (RR-BDA-D1895C)

Stay on the right side of the regulator with the Ray-Ran method C apparent density tester. It's the right choice for any organisation seeking accurate readings from course flakes, strands, chips and cut fibres to the applicable ASTM standards.

These materials are bulky when loosely poured and typically compressed to lessen the bulk, so a measure of their density under a small compressive load is really useful.

Selected features and benefits:

- Lead shot to increase plunger weight to 2300g (optional)
- Measuring funnel
- Weight plunger

Bulk Density Apparatus (BS 2782 Method 621A & ISO R60) (RR-BDA R60)

Best-in-class for when you need reliable apparent density, bulk factor or pourability testing results of moulding material to BC and ISO quality standards.

Simply pour your test sample through a specified funnel and let it flow into a cylindrical cup with a known volume of 100cm³.

Selected features and benefits:

- Comes with a stand and funnel shut off
- 100cm³ measuring cup

At Industrial Physics we do our best to design and build instruments to suit any valued customer's unique requirements. We make additional devices in this range and we'd be happy to take any special requests you may have too!

The Ray-Ran Universal Falling Weight Impact Tester (RR-FWT)

Safe, simple to operate and versatile in the tests it can deliver, our falling weight impact tester is the best in the business.

You can rely on it to determine the energy required to break or rupture many test specimens and components. That includes anything from pipe, sheet, laminates, composites, ceramics and non ferrous metals to all relevant international testing methods.

Selected features and benefits:

- Two-meter drop height test machine
- Low friction carrier bearing system
- Solenoid release mechanism
- Pneumatic carrier return
- Twin guide rail system

The Ray-Ran Instrumented Falling Weight Impact Tester (RR-IFWT)

Designed and built with operator simplicity in mind the New Ray-Ran Instrumented Falling Weight Impact Tester is sure to set a new benchmark in the industry.

Conforming to ASTM D7136, D3763-02, and ISO 6603, typical test specimens include pipe, sheet, laminates, composites, ceramics and nonferrous metals for material and component evaluation. With real time force vs time plots/results, velocity at impact and more, this apparatus uses both pneumatic and electrical functions making for an extremely versatile instrument.

Selected features and benefits:

- 2m or 3.35m variable drop height test machine
- Instrumented impacting head
- 47 pieces of collectable data
- Low friction carrier bearing system
- Impact energy ranges from 314J up to 1100J (dependent on model)
- TupDaq Data Acquisition Software
- Pneumatic TUP release, return and anti-rebound feature
- 5kN, 13kN, 22kN and 45kN load cells available

The Ray-Ran Advanced HDT / Vicat Apparatus (RR-HDV2, RR-HDV4)

Our HDT/Vicat apparatus will tell you all you need to know about the deflection and softening point characteristics of your thermoplastic specimens.

These two and four-station devices are designed and built to cover multiple international testing standards, including ISO306 and ASTMD1525. Using advanced microprocessor control technology to accurately test two or four samples at the same time.

Selected features and benefits:

- Manual raise / lower of test stations
- Solenoid operated cooling system
- Digital temperature control to 300°C
- HDT / Vicat testing enabled
- Oil bath stirrer

The Ray-Ran Advanced 6 Station HDT/Vicat Apparatus (RR-HDV6)

This highly accurate testing machine comes with all the benefits of the two and four station models. It gives you maximum testing capability using advanced microprocessor technology.

Custom-built for simultaneous testing of up to six samples, to HDT or Vicat testing methods. It's the best in class to accurately determine the deflection and softening point characteristics of all thermoplastic test specimens.

Selected features and benefits:

- Digital temperature control to 300°C
- Power rise and fall of test stations
- HDT/Vicat testing enabled
- Dual pump stirrer system
- Six sample test stations
- Data logging software

United Testing Systems DTM 50 kN Table Top UTM

Ideal for performing tension, compression, or advanced materials testing applications, Table Model frames are the ideal choice when testing materials such as plastic, rubber, textiles, metals, composites, adhesives, bolts, screws, fasteners, wood products, and related material.

Table model frames come in standard sizes, however taller or wider frames can be manufactured if the need arises.

Selected features and benefits:

- Dual Column load frame
- Maximum lateral motion ±0.25mm over full crosshead travel
- Emergency Stop Control is via rocker and mechanical limit switches
- Automatic overload protection standard
- Interchangeable load cell is standard
- Crosshead Guidance System: Uses heavy channel steel columns

Support & services

We believe that supplying you with high quality testing instruments is only part of our job. Being fast, efficient, and truly reliable is critical when it comes to servicing the technology that keeps your business running.

Wherever you are in the world, our experts are on hand to support your needs. From installation, through to calibration, repair, and preventative maintenance, we've got you covered. That's because at Industrial Physics, we're not just suppliers, we are here for you as trusted partners.

Whatever your requirement may be, if you're looking for the highest quality of test and inspection solutions to ensure the quality of your products, the team at Industrial Physics are here to support you.

"During our time with Industrial Physics we only encountered helpful people. The response to our questions is always very quick.

Our purchase orders are quickly confirmed and dealt with. Shipping time is very precise, we always get our package right on time, a few days after the order. The packaging is spot on, our ordered items are packaged very carefully all the time, and we get everything without any damage. In the past couple of years our partnership was smooth and productive. We at Inteszt Kft. hope that in the future everything will be the same and hopefully we will be able to complete many more deals"

Inteszt Kft.

Get in touch

Find out more about how we can support your unique needs and get in touch today.

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industrialphysics.com

INDUSTRIAL PHYSICS