



TORONTECH

RCP RAPID CRACK PROPAGATION TESTER - TORONRCP™



ISO 13477

RCP Rapid Crack Propagation Tester ToronRCP™ is designed to measure the critical pressure or temperature at which rapid crack propagation occurs.

APPLICATIONS

Standards

ISO 13477

Thermoplastic Pipes for Fluid Transport – Determination of Resistance to Rapid Crack Propagation (RCP) — Small-Scale Steady-State Test (S4 Test)

Principle

A section of thermoplastic test pipe, prepared to a defined length and conditioned to a specific test temperature and internal pressure, is impacted near one end to trigger a rapid longitudinal crack. The pipe is then inspected to assess whether the crack stopped or continued to propagate.

How to do the test

1. Once the impact speed is set, the system automatically calculates the required energy storage stroke based on the selected speed.

2. Open the top cover of the conditioning cabinet. Use a hoist to lift the conditioned pipe sample from the cabinet and mount it onto the specimen support bracket. Secure it in place.
3. Connect the pressure quick connector. The system will automatically pressurize the sample, deliver the support bracket to the impact chamber, and position it accordingly.
4. When the support bracket is correctly positioned and the internal pressure reaches the target value, both impact button indicators will illuminate and the alarm light will flash—signaling the system is ready for impact.
5. After putting on protective goggles and earplugs, press the impact button. The system will release the striker blade to impact the sample.
6. After the impact, the blade capture mechanism automatically secures the striker. Once lifted to a certain height, the support bracket returns to the installation position. Finally, examine and measure the crack length on the sample.

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FEATURES

Features for ToronRCP™ Test Unit

1. The energy storage unit is designed to convert elastic potential energy into kinetic energy, with adjustable impact speeds ranging from 1 m/s to 20 m/s.
2. An industrial control terminal with a full-color touchscreen delivers comprehensive information to the operator, including sample conditioning time, impact speed, test temperature, and more.
3. Rapid pressure filling with precise control allows target pressure to be reached within one minute for pipes ranging from DN 200 to DN 500.
4. A high-rigidity frame increases system durability, while integrated buffers reduce the force from high-speed impacts, ensuring stable component connections even after repeated tests.
5. The energy storage system offers high efficiency and reliability, featuring fast charging capability and a striker lifting mechanism that locks securely or releases quickly as needed.
6. An adjustable support structure and user-friendly assembly and alignment system with quick couplings streamline setup and deliver excellent performance during testing.
7. An automated safety verification system ensures both the sample and striker blade are correctly positioned. This prevents unintended collisions and ensures the striker is only released when the sample is securely in place.

Features for ToronRCP™ Low Temperature Conditioning Cabinet

1. Ultra-low temperature and high efficiency: The system can reach -30°C within 10 minutes, allowing multiple sample groups to be conditioned at the same time. Temperature is automatically monitored throughout the process.
2. A specialized cabinet sealing design prevents freezing between the seal and the cabinet structure.
3. An advanced thermal insulation system improves safety and reduces energy consumption.
4. Multiple safety features are built in, including an emergency escape mechanism and an alarm system for operator protection.

Features for ToronRCP™ Sample Delivery Unit

According to the standard, “crack initiation must occur within 3 minutes of removing the test pipe from conditioning,” leaving limited time to position the sample and pressurize it. To address this, we offer an optional fully electric sample delivery unit.

- 1. The delivery frame is built to securely support pipe specimens up to 400 mm in diameter.
- 2. Two control modes are available to suit different budgets: manual and automatic.

Features for ToronRCP™ Enclosure

The assembly includes front and rear sealing components, a limiting ring, internal baffles, O-rings, and more. A range of sizes is available, including $\Phi 63$ mm, $\Phi 110$ mm, $\Phi 160$ mm, $\Phi 250$ mm, $\Phi 315$ mm, $\Phi 400$ mm, and $\Phi 500$ mm.

- 1. The sealing parts, limiting ring, and internal baffles are interconnected and, along with the sample, are secured onto the V-support of the sample holding base. This setup ensures accurate alignment for the blade to strike the slotted area of the test pipe.
- 2. The specialized design offers a lighter weight with high rigidity, capable of withstanding up to 3 MPa pressure.
- 3. Its optimized structure allows for easy installation and reliable sealing, and pipe size changes (within the same SDR) can be completed quickly and efficiently.

TECHNICAL SPECIFICATIONS

Pipe Diameter Size	$\leq \Phi 250\text{mm}$ or $\leq \Phi 315\text{mm}$ (others on request)
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Impact Speed	3 selectable speed (10m/s, 15m/s, 20m/s) or set a speed between 5m/s ~ 15m/s, at a step of 0.5m/s
Speed Accuracy	± 0.5m/s
Pressure Range	≤ 2.5 MPa (Nitrogen)
Pressure Accuracy	Grade 0.5
Control Mode	PLC control and touch screen display
Striker Blade Release	Pneumatic
Pneumatic Energy Storage	Motor-driven
Security Protection	IP55
ToronRCP Low Temperature Conditioning Cabinet	
Number of Test Station	1
Pipe Diameter Size	≤ 315mm
Temperature Range	RT ~ -30℃
Temperature Display Accuracy	0.1 °C
Temperature Control Accuracy	± 3℃
Voltage	380 (-15%) VAC ~ 380 (1+10%) VAC 5kVA
ToronRCP Sample Delivery Unit	
Number of Test Station	1
Sample Delivery Mode	Automatic feeding & Automatic return
Sample Delivery Distance	3400mm
Sample Delivery Speed	370mm/s

Longest Time for Sample Delivery	21s
Voltage	220VAC -15% ~ 220VAC +10% 50Hz 300VA (110V is also available)



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