



TORONTECH

AUTO-DETECTION DUAL-TUBE KINEMATIC VISCOSITY TESTER WITH HOUILLON VISCOMETER



Auto-Detection Dual-Tube Kinematic Viscosity Tester with Houillon Viscometer - ToronVT™ AD-DT

ToronVT™ AD-DT is an automatic kinematic viscosity tester with Houillon viscometer technology, designed to quickly and accurately measure the kinematic viscosity of petroleum oils and lubricants in accordance with ASTM D7279. The instrument features full-automated detection, full-automated sample injection, full-automated measurement, and full-automated cleaning — delivering a complete hands-free test sequence that eliminates operator variability and reduces labor requirements to a minimum.

With dual viscometer tubes, a 3.5-liter bath volume, and a measurement range of 0.3 to 6,000 mm²/s, the ToronVT™ AD-DT is built for both routine quality control and high-precision laboratory work. Its performance is directly comparable to leading imported competing instruments. The instrument operates on a Windows-based interface with LIMS connectivity via WIFI, making it a practical choice for modern petroleum and lubricant testing laboratories.

APPLICATIONS

Auto-Detection Dual-Tube Kinematic Viscosity Tester with Houillon Viscometer - ToronVT™ AD-DT Applications

The ToronVT™ AD-DT Auto-Detection Dual-Tube Kinematic Viscosity Tester with Houillon Viscometer supports kinematic viscosity testing across a broad range of petroleum and industrial fluid applications:

- Engine oil quality control: ASTM D7279-compliant kinematic viscosity testing for motor oils, transmission fluids, and gear oils
- Petroleum product testing: gasoline, diesel oil, kerosene, cutting fluid, thermal oil, additives, and lubricating oils

- Fresh and in-service lubricating oil analysis: viscosity monitoring for condition monitoring and predictive maintenance programs
- Base oil testing: viscosity characterization for base stock qualification and blending operations
- Independent testing laboratories: automated high-throughput kinematic viscosity testing for commercial petroleum analysis services
- Research and development: reproducible kinematic viscosity data for fluid formulation studies and performance validation



Applicable Standards

The ToronVT™ AD-DT kinematic viscosity tester with Houillon viscometer is designed to support testing in compliance with the following international standards:

- ASTM D7279: Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids by Automated Houillon Viscometer
- ASTM D445: Standard Test Method for Kinematic Viscosity of Transparent and Opaque Liquids
- ASTM D446: Standard Specifications and Operating Instructions for Glass Capillary Kinematic Viscometers

FEATURES

Key Features of - ToronVT™ AD-DT

The ToronVT™ AD-DT automatic kinematic viscosity tester with Houillon viscometer delivers a comprehensive feature set for efficient, accurate petroleum testing:

- **Fast Measurement Cycle:** in fast mode, the result is available in 15 seconds. Generally, the full cycle (including sample injection, measuring, cleaning, drying, and result calculation) is completed within 3 minutes. The total process does not exceed 7 minutes.
- **Fully Automated Operation:** all functions (measuring, cleaning, drying, calculation, and repeatability reporting) are fully automated and consistently executed. The instrument achieves true unattended operation for long testing runs.
- **Broad Transparent and Opaque Sample Compatibility:** the ToronVT™ AD-DT accommodates the full range of Newtonian liquids including gasoline, diesel oil, kerosene, cutting fluid, thermal oil, additives, fresh lubricating oil, and in-service lubricating oil.
- **Fast Cleaning with Low Solvent Consumption:** quick and thorough automatic cleaning with low cost — the dosage of cleaning liquid for a cleaning process is no more than 10 mL. This minimizes solvent consumption and waste management burden.

- Comprehensive Auxiliary Functions: includes constant calibration, temperature calibration, calibration of the built-in real-time clock, automatic viscosity index calculation, and automated kinematic-to-Engler viscosity conversion.
- Software and Hardware Dual Over-Temperature Protection: over temperature protection is implemented at both software and hardware levels, with over-temperature alarm and dry-burning resistant protection functions to safeguard the bath, sample, and instrument components.
- Fast Heating and Cooling Rate: the double-glass cylinder bath achieves a heating and cooling rate of 5°C/min, enabling rapid temperature transitions between test conditions.
- High-Precision Temperature Sensing: PT500 high-precision temperature sensor provides stable, accurate temperature control. Temperature control accuracy reaches 0.01°C.
- Disposable Filter Compatibility: the instrument can be equipped with disposable filters to significantly reduce the workload of sample pretreatment.
- Quick Viscometer Replacement and WIFI/LIMS Connectivity: the viscometer tube is quickly changed without emptying the thermostat bath. Data can be transmitted wirelessly via WIFI to connect to LIMS systems for seamless laboratory data management integration.

THEORY & METHOD

Theory and Method

The ToronVT™ AD-DT measures kinematic viscosity using the Houillon viscometer capillary method as defined in ASTM D7279. A precisely controlled volume of oil sample is automatically injected into the Houillon capillary viscometer tube submerged in a precision constant-temperature bath. High-precision optical sensors detect the passage of the sample meniscus between two calibrated reference points, and the timing system (accurate to 0.01 s) records the capillary flow time. Kinematic viscosity is automatically calculated from the recorded flow time and the viscometer tube constant.

The full-automated detection function continuously monitors the sample flow state, automatically identifying when the meniscus has reached each detection point without operator observation. After the measurement cycle, the double

automatic solvent cleaning system purges the capillary tube and all sample-contact pathways, consuming no more than 10 mL of cleaning fluid per cycle. The double-glass cylinder bath provides uniform temperature distribution and a fast heating and cooling rate of 5°C/min, enabling efficient sequential testing across different target temperatures.

TECHNICAL SPECIFICATIONS

Technical Specifications of Auto-Detection Dual-Tube Kinematic Viscosity Tester with Houillon Viscometer

Parameter	Specification
Model	ToronVT™ AD-DT
Standard	ASTM D7279, ASTM D445, ASTM D446
Measurement Range	0.3 – 6,000 mm²/s; measuring span of two viscosity tubes is 100×
Sample Dosage	0.3 – 1 mL
Repeatability	≤0.5%
Viscometer Bath Volume	3.5 L
Total Power	≤400 W
Timing Accuracy	0.01 S
Temperature Controlling Accuracy	0.01°C
Temperature Controlling Range	20 – 100°C (extra refrigerator needed if target temp <40°C)
Main Unit Size	420 × 300 × 500 mm
Voltage	AC220V ± 10%; 50Hz ± 10% (110V is also available)

Parameter	Specification
Relative Humidity	<80% RH
Ambient Temperature	10 - 28°C
Other Notes	No strong vibration, airflow, strong electromagnetic interference, or corrosive gases in work environment



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