

DEAN STARK DISTILLATION WATER CONTENT



Dean Stark Distillation Water Content - TT-95

The TT-95 Dean-Stark distillation apparatus determines water content in petroleum products, tars, and other bituminous materials. Refinery laboratories, petrochemical quality control departments, and independent testing facilities use it for routine batch verification. The instrument conforms to ASTM D95, the standard test method for water in petroleum products and bituminous materials by distillation. It covers a measurement range of 0 to 25% water by volume. Operators rely on the TT-95 to confirm that crude oil, fuel, and asphalt shipments meet contractual water-content limits before further processing.

The TT-95 is built around a single electric heating element paired with a solid-state voltage regulator. This combination heats the sample and solvent mixture at a controlled, stepless rate. The gentle, adjustable heat prevents bumping or sample loss while still driving the test to completion. The apparatus pairs with standard Dean-Stark glassware, a graduated receiving trap, and a reflux condenser. Together, these components isolate the released water and present it for a direct volumetric reading.

Laboratories often select the TT-95 over titration-based instruments when the sample matrix is too dark, viscous, or particulate-laden for optical or electrochemical endpoint detection. The distillation method reads water volume directly from the graduated trap. Results stay unaffected by interfering compounds that can skew Karl Fischer titration in heavy fuels, tars, and asphalt emulsions. This makes the TT-95 a practical complement to titration equipment already in place in most petroleum testing laboratories.

APPLICATIONS

Dean Stark Distillation Water Content - TT-95 Applications

The TT-95 supports water content verification across the full range of petroleum products, tars, and bituminous materials named in ASTM D95, along with the fuel and process streams that share the same testing requirement.

- **Crude Oil and Petroleum Product Quality Control:** quantifies free and emulsified water in crude oil and refined petroleum products to confirm cargoes and batches meet contractual water-content limits
- **Asphalt and Bitumen Testing:** determines water content in bituminous binders and asphalt materials during production and pre-shipment quality checks
- **Biofuel and Biodiesel Testing:** measures water content in FAME, HVO, and blended biofuel streams alongside coulometric Karl Fischer methods for laboratories that need a distillation-based cross-check
- **Diesel Fuel Quality Testing:** verifies water content in diesel and distillate fuels to protect downstream engines and fuel systems from water contamination
- **Tar and Heavy Residue Analysis:** isolates water from tars and other dense residues where optical or electrochemical water-detection methods struggle with sample color and viscosity
- **Petroleum Refining and Midstream Operations:** monitors water carryover at custody transfer points, storage terminals, and blending operations
- **Industrial Lubricant and Oil Contamination Testing:** checks in-service and bulk lubricating oils for water ingress that can accelerate corrosion and reduce lubrication performance

Standards

The TT-95 Dean-Stark distillation apparatus conforms to the internationally recognized test method for determining water content in petroleum products and bituminous materials by distillation.

- ASTM D95 - Standard Test Method for Water in Petroleum Products and Bituminous Materials by Distillation

FEATURES

Dean Stark Distillation Water Content - TT-95 Key Features

The TT-95 pairs straightforward mechanical design with a heating control system built for the flammable solvents used in Dean-Stark testing.

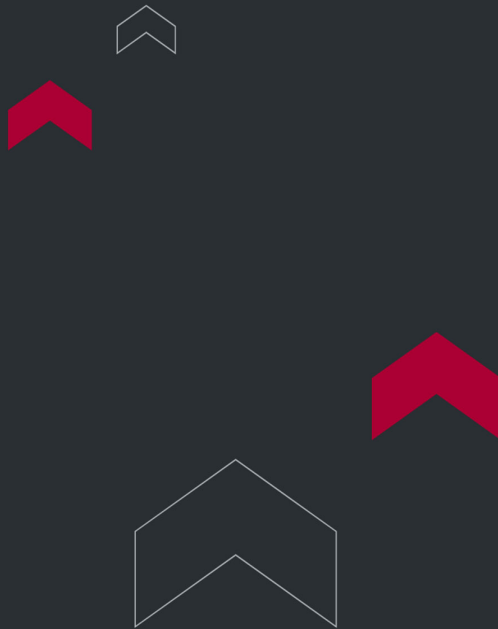
- **Stepless Solid-State Temperature Control:** the solid-state voltage regulator allows continuous, stepless adjustment of heating output so operators can dial in the exact reflux rate the test requires
- **Spark-Free Contactless Regulation:** the voltage regulator delivers stable heating output without physical contact, sparking, or electrical noise, supporting safer operation around flammable distillation solvents
- **Single-Element Heating:** a single electric heating element keeps the thermal design simple, which shortens troubleshooting and maintenance time
- **Integrated AC Voltmeter:** a 0 to 300V voltmeter displays the regulator output in real time, letting operators monitor and repeat heating settings for consistent results between runs
- **Compact, Safety-Oriented Build:** the enclosure design supports safe operation during extended high-temperature distillation runs with volatile solvents

TECHNICAL SPECIFICATIONS

Dean Stark Distillation Water Content - TT-95 Technical Specifications

Parameter	Specification
Applicable Standard	ASTM D95
Water Content Measurement Range	0 to 25% by volume
Test Method	Distillation (Dean-Stark method)

Parameter	Specification
Heating Element	Single element
Heating Power	0 to 650W, continuously adjustable
Temperature Control Mode	Solid-state voltage regulator, stepless
Regulator Display	AC voltmeter, 0 to 300V
Rated Voltage	AC 220V $\pm 10\%$, 50Hz (110V also available)
Operating Temperature	10°C to 40°C
Relative Humidity	$\leq 85\%$



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