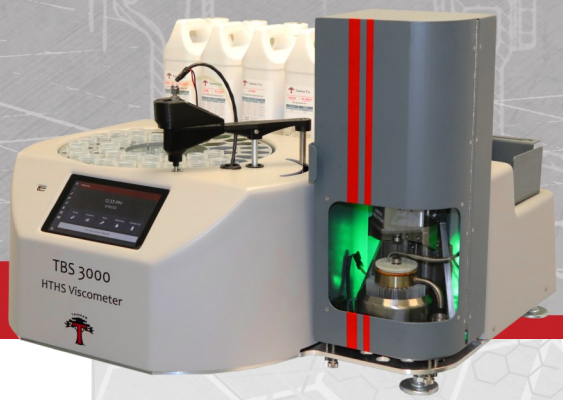
TANNAS CO.
LABORATORY INSTRUMENTS

TBS 3000 HTHS

Tapered Bearing Simulator Viscometer

ASTM D4683, D6616 | CEC L-36-90 | IP 370



Principle

High-Temperature, High Shear Rate Rotational (*Absolute*) Viscosity: The coaxial Rotor/Stator design permits the exact measurement of rotor position and the torque response of the liquid's resistance to flow (viscous friction), which determines the apparent fluid viscosity. Applying a constant and linear shear rate profile continually to the fluid makes the TBS an *absolute* viscometer where 'true' shear rate is calculated from known dimensions and speed of rotation. The TBS measures viscosities of fresh and used oils at multiple select shear rates and temperatures. This proves particularly useful with multi-grade oils and their influence on fuel efficiency.

History

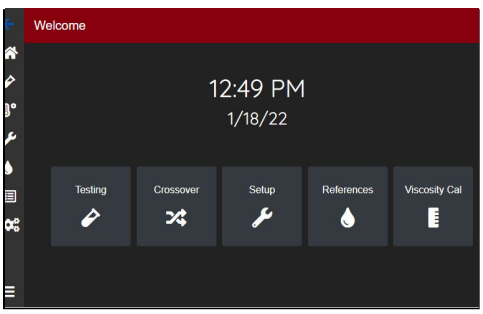
Developed in 1979 and under several patents, the TBS Viscometer became the world's first high shear viscometer. It remains the modern benchmark 'referee' instrument for HTHS viscometry due to its innovative measurement technique, robust design, and notable operational versatility.

Innovation

This newest TBS model is completely redesigned and re-innovated providing multiple enhancements to electrical and temperature components, automation, calibrations, and oil injection features, dramatically improving the overall user experience. These advancements promote simplified operations and less reference oil usage with no separate components, while offering the same or better precision and robustness as previous TBS models.

Features

- Integrated Custom Control System with custom PCB Boards and built-in TBS Touch Software – Eliminates computer, DAQ Boards and associated cabling.
- Improved operating stability to varying lab environment conditions.
- Built-in 40-position AutoSampler with auto single-injection mechanism.
- Incorporates up to (10) easily replaceable Reference Oil containers *(Quart, 1/2 Gal. or Gal.).*
- Custom LED lighting scheme based on operating condition.
- Innovative temperature control system – no external cooling bath for 80° operation.
- Auto rubbing contact
- Auto-monitoring of Waste Oil container with Overfill Alarm.
- Remote data access with Ethernet connection.
- Barcode reader compatible.



The new TBS® 3000 model offers a HMI touchscreen with TBS Touch Integrated Software.

ASTM D4683
CEC L-36-90, IP 370
JPI-5S-36-03

HTHS viscosity determination of fresh and used engine oils at 150°C and $1x10^6$ sec^{-1} shear rates.

Required for :

- ILSAC GF-2 to GF-6 (A&B) & dexos™ Engine Oil Specifications
- API 'SM', 'SN' and 'SP' categories for modern engine oils
- ACEA Oil Sequences
- SAE *J300* Engine Oil Viscosity Grade Classification

ASTM D6616

HTHS viscosity determination of large, medium speed, automotive, and heavy duty engine oils at 100°C and $1x10^6$ sec^{-1} shear rates.

- Basis for 100°C railroad oil viscosity classification.

Reference Technique:
TBS is the referee instrument for

ASTM D4741, D5481

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Parts & Accessories

TBS 3000 HTHS Viscometer:

330000: TBS 3000 HTHS Viscometer, 120-220 VAC, 50/60 Hz Power

Oil Package Options:

330100: 150°C Reference Oil Package

330101: CEC RL | 150°C Reference Oil Package (EU CEC)

330102: 100°C Reference Oil Package

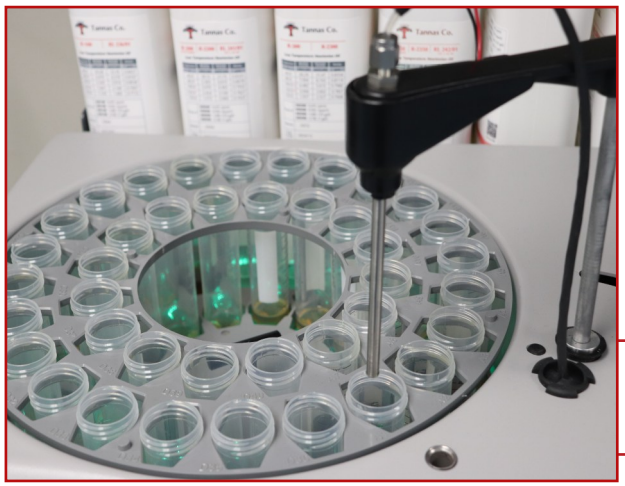
330103: 80°C Reference Oil Package

Components & Accessories:

300319: Collet Assembly Tool

Instrument Specifications

Dimensions (W x D x H)	Benchtop: 66 x 66 x 48 cm (26 x 26 x 19 inches)
Weight	~ 38.5 kg | (85 lbs.)
Voltage	100-240 VAC @ up to 6 Amp
Frequency	50/60 Hz.
Viscosity Range	1 to 10-15 mPa•s (cP) depending on temperature and shear rate
Sample Volume	Recommended 40 mL for chase-flush technique
Spindle Speed	Up to 8,000 RPM
Sample Test Time	Approximately 12 minutes per sample
AutoSampler Capacity	Auto-inject 1 to 40 sample sequentially
Operating Temperatures	Constant Temperature Control: 80°C, 100°C, and 150°C (±0.1°C)
Shear Rates	500,000 sec^{-1} to (3+) million sec^{-1} depending on viscosity and temperature
Read-out	Digital Touchscreen Display of Temperature, Torque and other operating conditions.
Safety	Safe restart (rotor motor and stator heater off) in case of power loss, CE Mark



Dual–ring, 40-position Sample Carousel with Auto Sample Receiver Arm

Additional TANNAS CO. Precision Laboratory Instruments

Tannas Foam *Air* Bath (TFAB)
- ASTM D892, D6082, D1881, D7840, IP146
- Non-liquid bath
- 24°C to 150°C range

Tannas Noack S2® Volatility Test
- ASTM D5800 Procedure D, CEC L-40
- Phosphorus Volatility
- non-Wood's metal heating system

***Quantum*® *Pro* Oxidation Tester**
- ASTM D2272, D2112, D4742, D942, IP229
- RPVOT, TFOUT, Grease Oxidation
- Non-liquid 'dry cylinder' sample heating

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