

# TBS<sup>®</sup> 3000 HTHS

Tapered Bearing Simulator Viscometer

ASTM D4683, D6616 | CEC L-36-A90 | 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<sup>®</sup> an *absolute* viscometer where 'true' shear rate is calculated from known dimensions and speed of rotation. The TBS<sup>®</sup> 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<sup>®</sup> 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

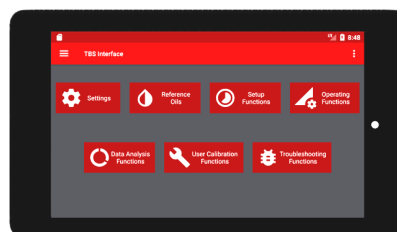
This newest TBS<sup>®</sup> model is completely redesigned and re-innovated providing multiple enhancements to electrical and temperature components, automation, calibrations, and oil injection features, dramatically improving the overall user experience. These advancements promote simplified operations 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<sup>®</sup> 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 (10) easily replaceable Reference Oil containers.
- Custom LED lighting scheme based on operating condition.
- Innovative temperature control system – no external cooling bath for 80° operation
- Auto-find Rubbing Contact
- Auto-monitoring of Waste Oil container with Overfill Alarm.
- Remote data access with Ethernet connection.

### Future Capabilities:

- Barcode reader
- WI-FI for intra-lab data transfers and/or remote firmware updates
- Automated Multi-High-Shear-Rate Modeling features



The new TBS<sup>®</sup> 3000 model offers a HMI touchscreen with TBS Touch Integrated Software.

**ASTM D4683**  
**CEC L-36-A90, IP 370**  
**JPI-5S-36-03**

HTHS viscosity determination of fresh and used engine oils at 150°C and 1x10<sup>6</sup> sec<sup>-1</sup> shear rates.

Required for :

- ILSAC GF-2 to GF-6 (A&B) & dexos<sup>™</sup> Engine Oil Specifications
- API 'SL', 'SM' and 'SN' 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<sup>6</sup> sec<sup>-1</sup> shear rates.

- Basis for 100°C railroad oil viscosity classification.

### Reference Technique:

TBS is the referee instrument for

**ASTM D4741, D5481**



## 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

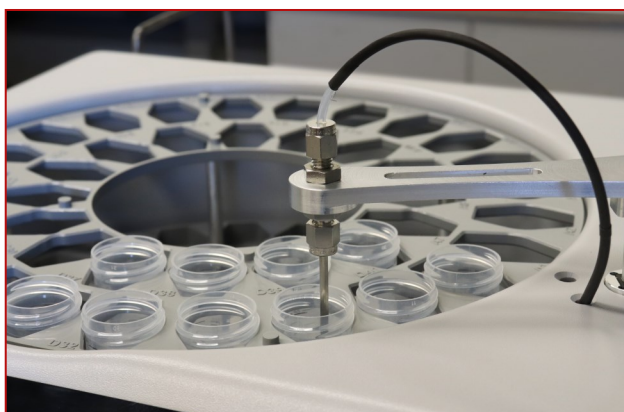
330101: CEC RL | 150°C Reference Oil Package (EU CEC)

330102: 100°C Reference Oil Package

330103: 80°C Reference Oil Package

### Components & Accessories:

300319: Collet Assembly Tool



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

## Instrument Specifications

<b>Dimensions</b> (W x D x H)	Benchtop: 66 x 66 x 48 cm (26 x 26 x 19 inches)
<b>Weight</b>	~ 38.5 kg   (85 lbs.)
<b>Voltage</b>	100-240 VAC @ up to 6 Amp
<b>Frequency</b>	50/60 Hz.
<b>Viscosity Range</b>	1 to 30 mPa·s (cP)
<b>Sample Volume</b>	Recommended 40 mL for chase-flush technique
<b>Sample Test Time</b>	Approximately 12 minutes per sample
<b>AutoSampler Capacity</b>	Auto-inject 1 to 40 sample sequences
<b>Operating Temperatures</b>	Constant Temperature Control: 80°C, 100°C, and 150°C (±0.1°C)
<b>Shear Rates</b>	500,000 sec <sup>-1</sup> to (3+) million sec <sup>-1</sup> depending on viscosity and temperature
<b>Read-out</b>	Digital Touchscreen Display of Temperature, Torque and other operating conditions.
<b>Safety</b>	Safe restart (rotor motor and stator heater off) in case of power loss

## 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, Evaporation Loss
- Phosphorus Volatility
- non-Wood's metal heating system



### Quantum® Oxidation Tester

- ASTM D2272, D2112, D4742, D942, IP229
- RPVOT, TFOOT, Grease Oxidation
- Non-liquid 'dry cylinder' sample heating



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