

Tannas Product Line

Precision bench-top instruments for routine and research laboratory testing of engine oils, lubricants and related fluids.



Scanning Brookfield Technique

Application: Required to meet specifications ILSAC GF-3, GF-4; API *SL*, *SM*; JPI-5S-56-99; ASTM D4485; China National Standard GB-11121 for engine oils. Recommended test in SAE *J300* Viscosity Classification for engine oils. The only instrument capable of measuring the *Gelation Index* of a lubricant.

Principle: Measures the low temperature pumpability and *Gelation Index* of fresh, sooted, and highly oxidized engine oils by slowly and continuously lowering the test temperature while recording the two values. Gel Index values above 12 have been shown to result in engine failure under certain field conditions of cooling.

(At left) Multi-purpose SB+2 liquid bath, viscometers, and data collection PC.

Test Methods: ASTM D5133, D7110, SH/T0732. SB+2 can also be equipped to run ASTM D2983 (GB-111145), D4684, D445, and D97.

Tapered Bearing Simulator (TBS) Viscometer

Application: High shear rate viscosity required to meet specifications ILSAC GF-3, GF-4; API *SL*, *SM*; JPI-5S-36-03; ACEA; ASTM D4485 for engine oils; SAE *J300* Viscosity Classification; Chinese GB-11121 & GB-11122. Applicable to ATF's, hydraulic fluids and railroad engine oils. The only absolute rotational viscometer. Cooler available for measuring high shear viscosities from 40°C and higher.

Principle: Measures high temperature, high shear-rate (HTHS) viscosity of engine oils and other lubricants at different temperatures by measuring the torque required to move a rotor within a stator at high speed and a clearance of 3.5 microns at test temperature. Simple motor speed adjustment permits shear rates to range from 50,000 to over 7 million sec^{-1} .

(At right) Full-Automation TBS 2100E-F & AutoSampler. Also available in *Manual* operating modes.

Test Methods: ASTM D4683 for 150°C; D6616 for 100°C; CEC L-36; IP370



Tannas Foam Air Bath (TFAB)

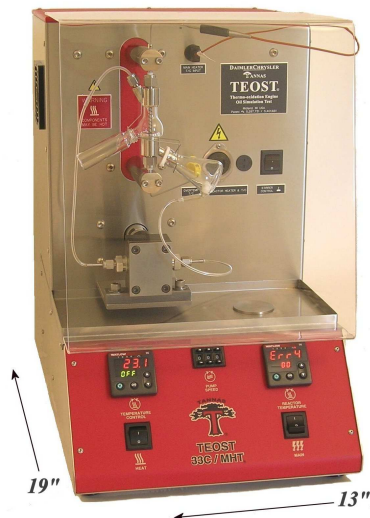
Application: Required to meet specifications ILSAC GF-3, GF-4; API *SL*, *SM*; ASTM D4485; China National Standard GB-11121 & GB-11122 for engine oils. Foaming is a serious deficiency of lubricating oils and hydraulic fluids and can cause destruction of the mechanism in which the fluid is used.

Principle: High foaming tendency and foam collapse time are two undesirable responses of engine oils and hydraulic fluids (ATF, power steering fluid, etc.) and can result in catastrophic failure of the mechanism. Engine oil specifications require measurement at 150°C. For such temperatures as well as rapid shift to 24° and 94.5°C, the TFAB was developed and is used to simplify and speed foaming analysis. Quick change from temperature to temperature with precise temperature control permits the six-station *air* bath to offer fast sample throughput, reduced bench space, and freedom from use and maintenance of messy heating oils.

Test Methods: ASTM D892, D6082, IP146, GB/T12579, SH/T0722



Thermo-oxidation Engine Oil Simulation Test (TEOST®)



TEOST MHT® : Required to meet specifications ILSAC GF-3, GF-4; API *SL*, *SM*; ASTM D4485; China National Standard GB-11121 for engine oils.

Principle: Simulates piston ring belt deposit tendencies in passenger car engines by continuously passing 10 mL of engine oil over a pre-weighed tubular steel rod 24 hours at 285°C. Increase in rod weight caused by deposits is used as a measure of oil performance.

Test Method: ASTM D7097

TEOST® 33C: Required to meet specifications ILSAC GF-2, API *SJ*; ASTM D4485; China National Standard GB-11121 for engine oils.

Principle: Simulates turbocharger deposits by continuously circulating 116 mL of oil over a pre-weighed tubular rod at temperatures varied cyclically from 200° to 480°C twelve times. Increase in rod weight caused by deposits is used as a measure of oil performance.

Test Method: ASTM D6335, SH/T0750

(At left) The *Dual* unit can be setup to run either test protocol. Test units are also available to specifically run only the MHT® or 33C protocols.

Tannas Quantum™ Oxidation Tester

Application: Used in a number of tests evaluating formulated engine oils, turbine oils, and base oil oxidation resistance. Used for meeting methods ASTM D2272, IP229, SH/T0193.

Principle: A small quantity of oil (50 g for D2272) is mixed with or brought in contact with catalyst within an oxygen-pressurized chamber. The oil sample is rotated at 100 RPM until the recorded oxygen pressure in the chamber falls rapidly and signals the end of the test. Automation package available.

(At right) The *Quantum* design is unique in operating without need for a hot liquid bath. This makes all preparations for test, return to test, and general operation, simple and direct – decreasing test turn-around time and interchangeability between methods.



Selby-Noack Volatility Test

Application: Required to meet specifications ILSAC GF-3, GF-4; API *SL*, *SM*; ASTM D4485; China National Standard GB-11121 & GB-11122 for engine oils.

Characterizes the tendency of base oils and formulated oils to volatilize in service. Determines the tendency of phosphorus and sulfur to volatilize from a lubricant by analysis of the volatilized material from the lubricant. Determination produces *Phosphorus Emission Index* (PEI) and *Sulfur Emission Index* (SEI).

The only instrument capable of producing PEI and SEI values and was first to eliminate the use of hazardous Wood's Metal applied by K. Noack, the original developer of the technique in 1936. (T.Selby eliminated the use of Wood's Metal and incorporated recovery of all volatile material in 1993.)

Principle (Volatility): The test oil volume (65 grams) is exposed to 250°C for one hour under slight vacuum. Loss of volatiles by weight is measured.

Principle (Indices): Weight of phosphorus and sulfur in recovered volatile material is determined and the number of milligrams per liter of both which would be emitted are determined.

Test Methods: ASTM D5800c, Equivalent to CEC L-40 method, SH/T0059.





Scanning Brookfield Technique (SB+4)

Application: Required to meet specifications ILSAC GF-3, GF-4; API SL, SM; JPI-5S-56-99; ASTM D4485; China National Standard GB-11121 for engine oils. Recommended test in SAE J300 Viscosity Classification for engine oils. The only instrument capable of measuring the *Gelation Index* of a lubricant.

Principle: Measures the low temperature pumpability and *Gelation Index* of fresh, sooted, and highly oxidized engine oils by slowly and continuously lowering the test temperature while recording the two values.

(At left) SB+4, the most cost-effective and compact SBT model available for labs with low to moderate SBT testing needs. Maximum capacity of up to *four* oil samples per cooling cycle. Capable of achieving temperatures down to -45°C .

Test Methods: ASTM D5133, D7110 for fresh, used and soot-containing oils, SH/T0732.

Tannas Basic Rotary (TBR) Viscometer

Application: A precise and low-cost approach to measuring viscosity at low shear rates (1 to 200 sec^{-1}) over a broad temperature range (20°C to over 200°C). The TBR can analyze fluids with viscosities ranging from 1 to $35,000\text{ cP}$ and is ideal for measuring heavily contaminated engine oils.

Principle: Low-shear rotational viscometer that measures the true viscosity value (dynamic viscosity) not a combined viscosity-density value (kinematic viscosity). Only one calibration is required for multi-temperature analysis.

Test Methods: Has been used for ASTM D445 viscosity studies on fresh, used and sooted oils.



Scanning Brookfield Technique (SB+8)

Application: Required to meet specifications ILSAC GF-3, GF-4; API SL, SM; JPI-5S-56-99; ASTM D4485; China National Standard GB-11121 for engine oils. Recommended test in SAE J300 Viscosity Classification for engine oils. The only instrument capable of measuring the *Gelation Index* of a lubricant.

Principle: Measures the low temperature pumpability and *Gelation Index* of fresh, sooted, and highly oxidized engine oils by slowly and continuously lowering the test temperature while recording the two values.

(At left) SB+8, dramatically increases testing capacity by accommodating up to *eight* SBT Viscometers. Free standing wall or aisle unit can easily be rolled to lab testing area. Capable of achieving temperatures down to approximately -70°C .

Test Methods: ASTM D5133, D7110 for fresh, used and soot-containing oils, SH/T0732.

Tannas Co. is an
ISO 9001 Certified company
committed to designing, building and
servicing the finest instruments in the world
for characterizing and understanding the properties
and behavior of today's automotive fluids and lubricants.

Tannas is a member of the *Savant Group*
of companies located at 4800 James Savage Road,
Midland, Michigan, USA. Other member companies
include Savant Inc., and the Institute of Materials (IOM).

All instruments manufactured by Tannas are laboratory
tested and certified prior to delivery to our customers.

On-site installation and customer training
is provided with each instrument and
is conducted by a Tannas
Certified Engineer.

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