



HIGH-TEMPERATURE AND HIGH-SHEAR RATE APPARENT VISCOSITY TESTER (HTHS)

High-Temperature and High-Shear Rate Apparent Viscosity Tester (HTHS) TT-5481

High-Temperature and High-Shear Rate Apparent Viscosity Tester (HTHS) TT-5481 conforms to ASTM D5481 Standard Test Method for Measuring Apparent Viscosity at High-Temperature and High-Shear Rate by Multicell Capillary Viscometer.

High-Temperature and High-Shear Rate Apparent Viscosity Tester (HTHS) TT-5481 facilitates the laboratory determination of high-temperature high-shear (HTHS) viscosity of engine oil at a temperature of 150°C using a multicell capillary viscometer equipped with pressure, temperature, and timing instrumentation. The shear rate for this test method corresponds to an apparent shear rate at the wall of 1.4 million reciprocal seconds ($1.4 \times 10^6 \text{ s}^{-1}$). This shear rate has been observed to reduce the discrepancy between this test method and other high-temperature high-shear test methods utilized for engine oil specifications. Viscosities are directly determined from calibrations established with Newtonian oils having viscosities ranging from 2 to 5 mPa·s at 150°C.

APPLICATIONS

The primary application of the High-Temperature and High-Shear Rate Apparent Viscosity Tester (HTHS) TT-5481 is to measure the **apparent viscosity of engine oils under conditions of high temperature (150°C) and high shear rate**, in compliance with the **ASTM D5481** standard. This HTHS viscosity is a critical performance parameter that simulates the conditions inside a running engine's bearings and other tight-tolerance areas. A lower HTHS viscosity can contribute to improved fuel economy, but it must remain high enough to provide adequate wear protection.

Key Industries

- **Lubricant Manufacturing:** This is a mandatory test for lubricant blenders formulating modern, fuel-efficient engine oils. The HTHS viscosity is a key specification for oil grades defined by organizations like API, ACEA, and ILSAC, and it is

essential for certifying that the oil meets the performance requirements of modern engines.

- **Automotive and Engine Manufacturing:** Automakers rely on HTHS viscosity data to specify the correct engine oil for their vehicles. It is a fundamental parameter in the balance between achieving fuel economy targets and ensuring long-term engine durability and wear protection.
- **Additive Manufacturing:** Chemical companies that develop and produce viscosity index (VI) improvers and friction modifier additives use this test extensively in their research and development. It allows them to evaluate how their additives perform under the high-temperature, high-shear conditions found inside a running engine.

FEATURES

- Featuring touch screen operation and a built-in standard computer calculation program, this apparatus is easy to operate.
- It is equipped with an needle valve and a full-time safe pressure detecting system.
- With a simple one-button operation to initiate the test, it offers ease and convenience of use.

TECHNICAL SPECIFICATIONS

1. Conforming to ASTM D5481 standard.
2. Utilizes electrical heating bar for temperature control.
3. Temperature control range: Ambient to 150°C $\pm$ 0.1°C.
4. Capillary tube dimension: ϕ 0.15*18mm.
5. Power: 700W.
6. Pressure oxygen source: Oxygen, CO₂.

7. Dimensions: 360*450*630mm, weighing 40kg.



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