

# APPARATUS FOR SHEAR STABILITY OF LUBRICATING OILS CONTAINING POLYMERS



# Apparatus for Shear Stability of Lubricating Oils Containing Polymers TT-51350-6

Apparatus for Shear Stability of Lubricating Oils Containing Polymers TT-51350-6 complies with DIN 51350-6 standards.

Apparatus for Shear Stability of Lubricating Oils Containing Polymers TT-51350-6 is utilized for testing lubricants in the Shell four-ball tester, specifically for determining the shear stability of lubricating oils containing polymers.

The tapered roller shearing system evaluates the viscosity shear stability of transmission lubricants. This equipment, a standard four-ball extrusion tester with a constant temperature device, includes components such as an embedded body, mandrel, tapered roller friction pair, tapered roller bearing, and temperature control instrument.

The tapered roller bearing tester (KRL) subjects the lubricating oil under test conditions similar to those in a gearbox, inducing mechanical shear stress. This stress leads to permanent viscosity loss and movement in the test lubricant before and after testing. The rate of viscosity decrease serves as an indicator of the lubricating oil's shear stability. This test method originated from the sixth part of the German standard DIN 51350, also referred to as KRL (Kugel Rollen Lager in German, abbreviated as KRL) or CEC L-45-99.

## APPLICATIONS

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The primary application of the Apparatus for Shear Stability of Lubricating Oils Containing Polymers TT-51350-6 is to determine the **mechanical shear stability of polymer-containing lubricants**, particularly transmission and gear oils, in compliance with the **DIN 51350-6** standard (also known as CEC L-45-99). The test uses a tapered roller bearing (KRL) to subject the oil to intense, prolonged mechanical shear stress that simulates the harsh conditions inside a gearbox. By measuring the permanent viscosity loss, the test provides a critical assessment of the lubricant's ability to "stay-in-grade" and maintain its protective properties under severe service.

## Key Industries

- **Lubricant Manufacturing:** This is a crucial quality control and development tool for formulators of high-performance driveline fluids, such as manual transmission fluids, axle oils, and industrial gear oils, where maintaining viscosity under extreme shear is paramount for equipment protection.
- **Additive Manufacturing:** Chemical companies that develop and produce the advanced Viscosity Index (VI) improver polymers used in gear and transmission oils rely on this severe shear test to evaluate and certify the performance and durability of their products.
- **Automotive and Heavy Equipment:** This industry uses the test to qualify and specify lubricants for their transmissions, axles, and final drives. The KRL test ensures that the chosen lubricant can withstand the mechanical shearing in these components and provide reliable protection throughout a full service interval.

## TECHNICAL SPECIFICATIONS

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1. Dimensions: 640\*380\*895mm.
2. Motor speed: 1475±25RPM.
3. Temperature control mode: Utilizes an compressor.
4. Sample temperature: Maintained at 60±1°C.
5. Sample volume: 40±0.5ml.
6. Test load: 5000±200N.
7. Test period: 174000 cycles (approximately 19 hours and 40 minutes).
8. Power: 5.5KW.
9. Weight: 150kg.



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