

## Ultra Shear Viscometer (USV)

The Ultra Shear Viscometer, or USV, is an instrument capable of fully automatic viscosity measurements at 10,000,000 reciprocal seconds and 150°C.



### Application

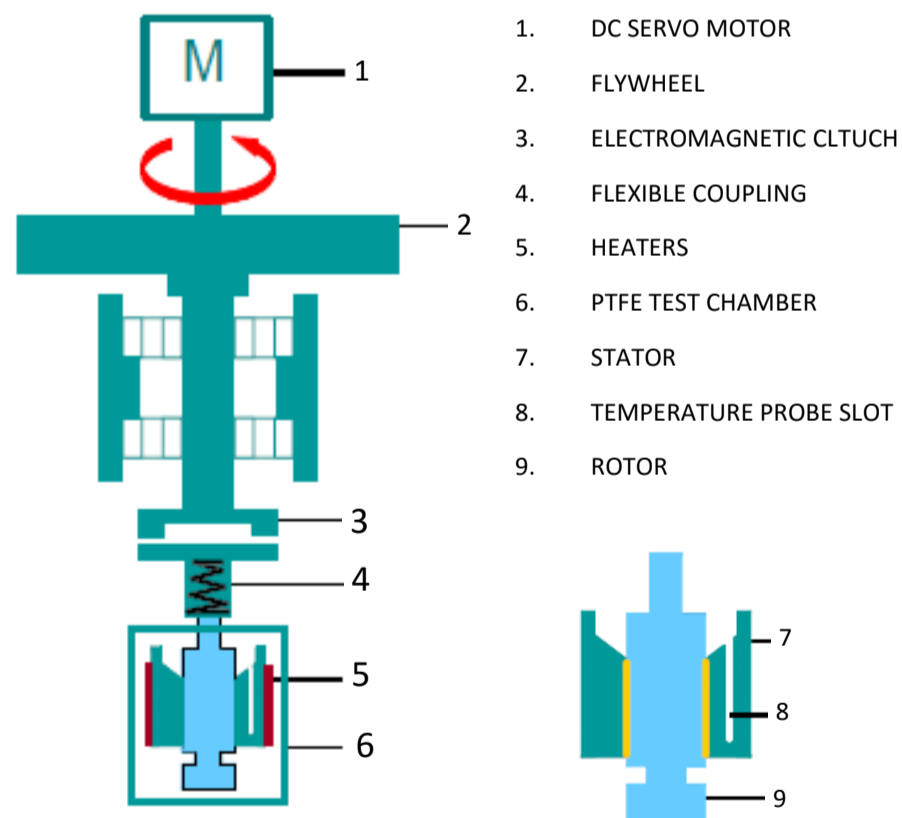
- Shear rates similar to in service conditions of a modern automotive engine can be mimicked
- Testing new and degraded oils.

### Specification

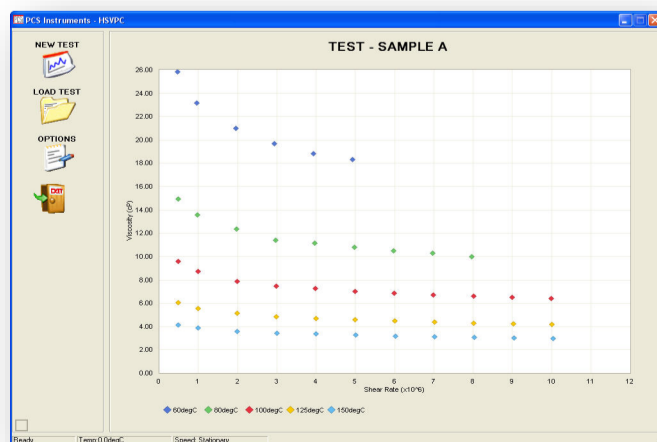
- Shear Rate Range  $10^6\text{s}^{-1}$  to  $10^7\text{s}^{-1}$
- Temperature up to 150°C
- Sample Volume < 5ml

### Test Set-Up

- Fitted with a DC servo motor capable of speeds of over 20,000 rpm.
- An electromagnetic clutch engages the rotor for 30 ms.
- This brief shearing interval minimizes the shear heating in the lubricant.
- The radial gap between the rotor and stator is one micron, making shear rates as high as  $10^7\text{s}^{-1}$  achievable.
- The rotor and stator are both made of tungsten carbide therefore both expand uniformly. This makes the gap change with temperature negligible.
- Constant radial gap means no calibration is necessary
- Measurements are logged by an in-built micro-processor
- Viscosity results are plotted against shear rate displayed in graph format on the USV software



Rotor and Stator



Example results Non-Newtonian oil



Pipette and tips