

SHEAR STABILITY OF POLYMER CONTAINING FLUIDS USING A EUROPEAN DIESEL INJECTOR APPARATUS D 6278-02

SIGNIFICANCE AND USE

This test method covers the evaluation of the shear stability of polymer-containing fluids. The test method measures the percent viscosity loss at 100°C of polymer-containing fluids when evaluated by a diesel injector apparatus procedure that uses European diesel injector test equipment. The viscosity loss reflects polymer degradation due to shear at the nozzle.

TEST METHOD/SUMMARY

This test method evaluates the percent viscosity loss for polymer-containing fluids resulting from polymer degradation in the high shear nozzle device. Thermal or oxidative effects are minimized. This test method is used for quality control purposes by manufacturers of polymeric lubricant additives and their customers.

A polymer-containing fluid is passed through a diesel injector nozzle at a shear rate that causes polymer molecules to degrade. The resultant degradation reduces the kinematic viscosity of the fluid under test. The percent viscosity loss is a measure of the mechanical shear stability of the polymer-containing fluid.

APPARATUS/TEST FIXTURES

The apparatus consists of a fluid reservoir, a double-plunger pump with an electric motor drive, an atomization chamber with a diesel injector spray nozzle, and a fluid cooling vessel, installed in an area with an ambient temperature of 20 to 25°C (68 to 77°F).

REPORT

The percent viscosity loss (PVL) of the sheared oil is calculated:
$$PVL = 100 \times (V_u - V_s)/V_u$$

where:

V_u = kinematic viscosity of unsheared oil at 100°C, mm²/s,
and

V_s = kinematic viscosity of sheared oil at 100°C, mm²/s.

The following information is reported:

- The calibration pressure, in Mpa
- Kinematic viscosity of the unsheared oil at 100°C
- Kinematic viscosity of the sheared oil at 100°C
- Percent viscosity loss (PVL) as calculated in 12.1.



DE13570



DE135761

