

EXTREME PRESSURE TEST ON OILS BY THE FALEX MACHINE

Application

This method is used to determine the film strength or load carrying property of an oil by means of mechanical testing equipment.

Apparatus and Materials Required

Falex Extreme Pressure Tester (See sketches 1 and 2)

Used to apply a prescribed load to a standard test pin which is rotated by the machine in a bath of the oil under test.

Source: Faville LeVally Corp.
1129 Bellwood Ave.
Bellwood, IL U.S.A.

Standard Steel Test Pin

(See sketches)

Standard V-Block

Brass Shear Pin

Source: Faville LeVally Corp.

Stop Watch

Naphtha

Note: Chlorinated solvents must not be used as these impart a surface film to the test parts which will give erroneous results.

Standard Copper Test Coupon "E"

Source: Faville LeVally Corp.

Date	Action	Revisions
2001 07 23	Revised	Editorial – no technical change A. Cockman
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Page 1 of 10

Conditioning and Test Conditions

All test values indicated herein are based on material conditioned in a controlled atmosphere of 23 +/- 2 °C and 50 +/- 5 % relative humidity for not less than 24 h prior to testing and tested under the same conditions unless otherwise specified.

Procedure**Warm-up**

1. Remove loading device and open jaws.
2. Insert a standard test pin in the lower end of the rotating column, line up matching holes in column and test pin and insert shear pin.
3. Insert the two standard V-blocks in the holes provided in the jaws.
4. Close the jaws and attach the loading device.
5. Fill oil container to the mark provided on the inside of the tray with a sample of any lubricant approved (approx 55 mL).
6. Start the machine and apply a load of 227 kgf by engaging the pawl and ratchet to the wear teeth, and run for 15 minutes. This is the initial warm up. For repeated tests, a warm machine at 65 °C is satisfactory.

Method A - Step Test for Hydraulic Oils

Increment of 45.4 kgf.

1. Remove the test pin and V-block used in the warm-up procedure and wash the apparatus with the specified solvents.
2. Insert a new standard test pin and V-block carefully degreased in the solvent after first inspecting and discarding any with surface imperfections.
3. Attach the loading device and fill the cup with a test sample of the well mixed oil.
4. Start the machine, engage the pawl and ratchet until a load of 136 kgf is reached and disengage the ratchet.
5. Set the stop watch, run the machine for 3 minutes at this load and record the torque.
6. Increase the load in increments of 45.4 kgf and run at 1 minute intervals, recording the torque before and after each run at new load.

Note:

1. If the load falls off, increase it to the required number of pounds by engaging the pawl and ratchet.
2. Inability to maintain load indicates failure of lubricant.
7. Repeat the load additions and recordings every minute until a failure occurs as indicated by a rapid loss in the load applied, increase in torque caused by wear or in the shear pin breaking.

Note: If the applied load increased to 907 kgf without failure, stop the test. In this case the oil must be tested according to Method B (Step Test with increments of 113 kgf).

Method B - Step Test for Hypoid Gear Oils

Increment of 113 kgf.

1. Remove the test pin and V-block used in the warm-up procedure and wash the apparatus with the prescribed solvents.
2. Insert a new standard test pin and V-block carefully degreased in the solvent after first inspecting and discarding any with surface imperfections.
3. Attach the loading device and fill the cup with a test sample of the well-mixed oil.
4. Start the machine, engage the pawl and ratchet until a load of 225 kgf is reached and disengage the ratchet.
5. Set the stop watch, run the machine for 3 minutes at this load and record the torque.
6. Increase the load in increments of 113 kgf and run at 1 minute intervals, recording the torque before and after each run at new load.

Note:

1. If the load falls off 22.7 kgf, increase it to the required number of pounds by engaging the pawl and ratchet.
2. Inability to maintain load indicates failure of lubricant.
7. Repeat the load additions and recordings every minute until a failure occurs as indicated by a rapid loss in the load applied, increase in torque caused by wear or in the shear pin breaking.