



MEASUREMENT OF FILM LIFE AND ANTI-WEAR PROPERTIES
OF GREASES AND DRY FILM LUBRICANTS

Application

This procedure is used to determine the film life and anti-wear properties of greases and dry film lubricants by means of the Timken Extreme Pressure Machine operating at 800 rpm.

Description of Test

A Timken roller bearing cup is attached to the rotating shaft of the Timken machine. A rectangular test block is brought into contact with the cup at a prescribed load, after the cup and block are film coated with a given amount of test lubricant. The lubricant is evaluated by the width of the wear scar which occurs on the test block in a prescribed time.

Apparatus Required

Timken Extreme Pressure Machine (see attached drawing)

Source: Faville-LeVally Corp.
2055 Comprehensive Drive
Aurora, IL 60505

Required is a 2 hp, 1750 rpm motor and an adjustable pulley of variable diameter to obtain a spindle speed of 800 +/- 5 rpm and a sliding speed of approximately 122 m/minute.

The pump shall not be used during this test since no liquid lubricant will be circulated.

Balance

Accurate to 0.001 g.

Weight Loading Mechanism

A mechanism must be used to raise and lower the load applying arm at a constant speed of 25 mm per minute to avoid impact of the cup on the test block. A suitable loader can be obtained from Faville-LeVally Corp.

Stopwatch or Timing Device

The time piece shall be capable of measuring 8 h +/- 1.0 minutes.

Microscope

A low power 50X to 60X microscope fitted with a filar eyepiece is used to measure width of wear scar with an accuracy of +/- 0.05 mm.



FORD LABORATORY TEST METHOD

BJ 001-04

Materials Required

Naphtha, Stoddard Solvent, Kerosene or Pentane

These may be used for cleaning the test blocks and cups, machine spindle, and block holder. Do not use chlorinated solvents inasmuch as they may impart a surface film which may give erroneous results.

Caution: Low flash point. Refer to Fire Control Bulletin No. 18. Refer to Industrial Hygiene for health and safety comments. Industrial Hygiene Field Service Telephone: (313) 33-78955.

Test Cups

Timken test cups, No. T-48654, similar to the outer race of a small Timken roller bearing.

Type of Steel	AISI 8720
Case Depth	1.00 - 1.50 mm
Hardness	HRC 58 - 62
Surface Finish	20 - 30 microinches

Test Blocks

Timken steel blocks, No. T-45349, 1.27 cm square and 1.9 cm long.

Type of Steel	AISI 4320
Case Depth	1.00 - 1.50 mm
Hardness	HRC 58 - 62
Surface Finish	20 - 30 microinches

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

1. Wash Timken cup and block with one of the prescribed solvents and dry thoroughly. Avoid finger marking specimens.
2. Assemble cup on spindle of machine and block in specimen holder.
3. For greases, stir the whole grease sample with a spatula to intermix the oil and soap thoroughly. Weigh 0.30 to 0.35 grams of grease and spread uniformly on cup and test surface of block.
4. For dry film lubricants, use thickness of film as required for test.
5. Locate specimen holder on load lever arm with the minimum disruption of the grease or dry film on the block or cup.

Automotive Safety and Engineering Standards Office

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