

LUBE

TECHNI-GRAM



FROM :

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DEFINING TIMKEN OK LOAD

The Timken OK Load test is one of a number of bench tests that have been designed to simulate extreme pressure conditions and to evaluate the load carrying capacity of lubricants. The tester is operated with a steel test cup of a tapered roller bearing rotating against a steel test block. The rotating speed is about 800 RPM for 10 minutes or until failure occurs. Grease or oil is applied at a constant rate of 45 grams per minute and a temperature of 80° (plus or minimum 15°) Fahrenheit. A specified load is placed on the lever and the test block is inspected at the end of the run for scoring. If scoring occurs the test is re-run using progressively lighter loads and a new steel ring and test block each time. The maximum load (OK value) is the last weight where the rotating cup will not rupture the lubricant film and cause abrasion between the rotating cup and the stationary block.

This method is widely used for specification purposes to differentiate between lubricants having low, medium, or high levels of extreme pressure properties. It is important to note that industry authorities agree that only *general conclusions* can be drawn from the Timken OK Load or any other EP test. The results do not necessarily reflect those experienced in actual service.

Operational techniques and alignment of this test machine are very critical. Operators must be trained on proper operational techniques and follow ASTM-D 2509 (Greases) or ASTM-D 2782 (Fluids) standards. While modified versions of this EP test are conducted by salesmen in the field for demonstration purposes, this is not a valid test for determining Timken OK Load unless they are properly trained in the total operation of the test machine and follow ASTM standards. There are various ways to alter the results of the Timken test, so unless the exact ASTM methods are used, then the test results are not valid.

Many of our products are tested under the ASTM standards for checking the OK Load of the products. However, this is done strictly for specification purposes and does not verify how well the product will function in the field. Generally the only products that are tested on the OK test machine are those products which have extreme pressure additives added in their manufacturing process. Results should be related to additional information about the lubricant such as anti-wear properties, type of additive, corrosion characteristics, etc. Typically, acceptable load values for various compounds obtained just prior to scoring range between 30 and 55-lbs. With an average of 40-lbs. Expressed as the Timken OK Load.

Some manufacturers greatly inflate their Timken load number by boosting the EP additives. This is often used as a marketing tool to give the impression that the higher EP rating indicates a superior grease or other lubricant. Again, industry authorities caution against selecting a grease or other lubricant simply by the



... to keep it running

results *of any one test*. Too much EP additive can have a negative affect on metal surfaces due to etching or corrosion. This negative effect is especially prevalent when too much EP additive is used in conjunction with applications involving yellow metals.

SUMMARY

There are many different tests that can be run on lubricants to check their performance under different conditions such as extreme pressure loads, high temperatures, low temperature torque, oil separation, dropping point, evaporation loss, water wash-out, oxidation stability, rust preventative properties, leakage tendencies, cone penetration, shear stability and many other tests. No one test can determine the lubricant's ability to function and many of these tests are done strictly for specification purposes. The most widely used test for checking extreme pressure properties and other characteristics of lubricants are used mostly for specifications and *do not* show how well they will function in the actual operation.

Photo of Diagram

Diagram of the Timken OK Load Test Procedure