

API CJ-4 / Noack Volatility

ASTM D 5800

SPECIFICATIONS

This test is approved for API CJ-4.

SIGNIFICANCE AND USE

The evaporation loss is of particular importance in engine lubrication. Where high temperatures occur, portions of an oil can evaporate. Evaporation may contribute to oil consumption in an engine and can lead to a change in the properties of an oil. Many engine manufacturers specify a maximum allowable evaporation loss. Some engine manufacturers, when specifying a maximum allowable evaporation loss, quote this test method along with the specifications. Procedure C, using the Selby-Noack apparatus, also permits collection of the volatile oil vapors for determination of their physical and chemical properties. Elemental analysis of the collected volatiles may be helpful in identifying components such as phosphorous, which has been linked to premature degradation of the emissions system catalyst.

APPARATUS

A Noack evaporative tester, comprised of the following pieces, is used: electrically heated block unit made from a malleable aluminum alloy, insulated at the inlet and base against loss of heat; evaporating crucible; crucible clamp and spanner; reamer; ball bearing; thermometer; contact-type control thermometer; glass delivery tubes; two glass bottles; a monometer; a glass T-piece; a vacuum pump; a timer; and silicone rubber tubing.

TEST METHOD / SUMMARY

A measured quantity of sample is placed in an evaporation crucible or reaction flask that is then heated to 250°C with a constant flow of air drawn through it for 60 minutes. The loss in mass of the oil is determined. This test method covers three procedures for determining the evaporation loss of lubricating oils (particularly engine oils). Procedure A uses the Noack evaporative tester equipment; Procedure B uses the automated non-Wood's metal Noack evaporative apparatus, and Procedure C uses Selby-Noack volatility test equipment. Procedures A and B use an electrically heated block to heat a steel crucible where Procedure C heats the glass reaction flask with an electric heating element. A vacuum pump is used to maintain a constant flow of air across the surface of the sample.

PASS / FAIL CRITERIA

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| Evap Loss @ 250C | |
| Vis Grades other than 10W-30, max | 13% |
| Evap Loss @ 250C | |
| 10W-30, max | 15% |

