API CJ-4 / Foaming

ASTM D 892 (No Opt. A)

SPECIFICATIONS

This test is approved for API CJ-4.

TEST METHOD / SUMMARY

The sample, maintained at a temperature of 24°C (75°F) is blown with air at a constant rate for five minutes, then allowed to settle for 10 minutes. The volume of foam is measured at the end of both periods. The test is repeated on a second sample at 93.5°C (200°F), and then, after collapsing the foam, at 24°C (75°F).

SIGNIFICANCE AND USE

The tendency of oils to foam can be a serious problem in systems such as high-speed gearing, high-volume pumping, and splash lubrication. Inadequate lubrication, cavitation and overflow loss of lubricant can lead to mechanical failure. This test method is used in the evaluation of oils for such operation conditions. This test method covers the determination of the foaming characteristics of lubricating oils at 24°C and 93.5°C. Means of empirically rating the foaming tendency and the stability of the foam are described.

PASS / FAIL CRITERIA

Foam volumes in mL at the end of three five-minute blowing period and ten-minute setline period, as received, and after agitation, are recorded for Sequences I, II, and III. For the purpose of reporting results, when the bubble layer fails to completely cover the oil surface and a patch or eye of clear fluid is visible, the value shall be reported as “0 foam”.

Foaming / Settling	
Sequence I, max	10 / 0 %
Sequence II, max	20 / 0 %
Sequence III, max	10 / 0 %

APPARATUS

A foaming test apparatus, consisting of a 1000-mL graduated cylinder is fitted with a heavy ring to overcome the buoyancy, and an air-inlet tube, to the bottom of which is fastened a gas diffuser. Test baths large enough to permit the immersion of the cylinder at least to the 900-mL mark and capable of being maintained at temperatures constant to 0.5°C (1°F) at 24°C (75°F) and 93.5°C (200°F), respectively. Both bath and bath liquid are clear enough to permit observation of the graduations on the cylinder. Air supply from a source capable of maintaining an airflow rate of 94 ± 5 mL/min through the gas diffuser is required.