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ANSI/ASHRAE Standard 86-2026
Methods of Testing the Floc Point of Refrigeration-Grade Oils

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Preview

NOTE

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FOREWORD

This standard describes a standard test method for measuring the floc point (waxing tendency) of refrigeration-grade oils. Petroleum-derived oils are mixtures of large numbers of chemically distinct hydrocarbon molecules. At the low temperatures encountered in the low-pressure side of refrigeration units, some of the larger molecules separate from the bulk of the oil in the form of wax-like deposits. Wax deposition of these molecules in refrigeration systems is undesirable, as they are known to clog capillary tubes and to cause expansion valves to stick. The floc point procedure requires, in addition to the oil, a fluid in which the oil is completely miscible to a temperature below that at which floc will form. Refrigerant-12 (R-12) was selected because it fits this requirement. Refrigerant-22 (R-22), for example, cannot be used because phase separation would, generally, result before the floc point was reached. The ensuing hazing, clouding, and separation into two different layers precludes obtaining a floc point. The industry has a great deal of experience in successfully extrapolating floc point data from the test tube to field application.

Development of a floc point using some other fluid besides R-12 is feasible. However, it would require a research project, and extrapolation of the data from another fluid without the field correlation, which has been available for R-12 floc point data, could result in major field problems.

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1. PURPOSE

This standard provides a method for measuring the waxing tendency of refrigeration-grade oils.

2. SCOPE

The floc point measurement indicates the waxing tendency of refrigeration-grade oils at low temperatures. The floc point is defined as the highest temperature at which wax or other solid substances precipitate when a mixture of 10% by volume of oil and 90% by volume R-12 is cooled under specified conditions. The results can be used to compare the waxing tendency of several different oils.

3. DEFINITIONS

floc point: the highest temperature at which solid substances precipitate when a mixture 10% by volume of oil and 90% by volume of R-12 is cooled under specified conditions.

flocculent: containing, or occurring in the form of, loosely aggregated particles or soft flakes.

refrigeration-grade oil: a naphthenic/paraffinic type oil that is stable with system components, will form a friction-reducing film between rubbing surfaces and seal critical clearances, and has low-temperature transport properties suitable for the application for which it is used.

wax: higher molecular weight materials that are not soluble in R-12/mineral oil mixtures at a particular temperature.

Preview