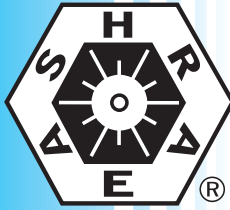


ANSI/ASHRAE Standard 99-2006
(Supersedes ANSI/ASHRAE Standard 99-1987)



ASHRAE STANDARD

Refrigeration Oil Description

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CONTENTS

ANSI/ASHRAE Standard 99-2006 Refrigeration Oil Description

SECTION	PAGE
Foreword.....	2
1 Purpose	2
2 Scope	2
3 Definitions.....	2
4 Test Procedures and Significance of Tests.....	3
5 References	4

NOTE

When interpretations or errata to this standard have been approved, they can be downloaded free of charge from the ASHRAE Web site at <http://www.ashrae.org>.

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FOREWORD

Refrigeration oil covers a wide variety of commercially available or experimental lubricants often differing widely in both composition and performance characteristics. This standard provides a uniform means of identifying particular refrigeration oils without resorting to commercial names or designations by utilizing common laboratory tests that are well recognized by those concerned with the use of the oil. The use of this standard in the literature will permit investigators concerned with oil performance to duplicate experimental programs and allow readers to relate oil characteristics to the subject presented.

First published in 1981, Standard 99 was developed under the sponsorship of ASHRAE Technical Committee 3.4. It represents a joint effort of knowledgeable refrigerating industry consultants, equipment builders, and oil suppliers to define the most meaningful laboratory tests that will adequately characterize a particular refrigeration oil. The 1981 standard was reaffirmed with minor editorial changes in 1987. This edition of the standard has been revised to include synthetic lubricants, especially those used with HFC refrigerants.

1. PURPOSE

The purpose of this standard is to describe lubricants used in refrigerating and air-conditioning systems based on molecular structure, physical properties, and chemical properties. Since the properties of generically similar lubricants can vary significantly depending on source of formulation, terms such as "refrigeration lubricant" have little meaning in defining such materials. This standard defines those properties critical to the precise identification of synthetic as well as petroleum-based lubricants, along with recognized test procedures for the determination of these properties.

2. SCOPE

2.1 Application. This standard applies to both synthetic and petroleum-derived lubricants used or proposed as compressor lubricants in refrigeration systems.

2.2 Test Methods. This standard provides recognized test methods to

- a. describe a specific class of refrigeration lubricant without the use of commercial designations,
- b. describe the molecular structure for various classes of refrigeration lubricants, and
- c. define the critical properties needed to describe a refrigeration lubricant using recognized test procedures.

2.3 Limits. This standard is not intended to define refrigeration oil quality through the establishment of test specifications or requirements. In addition, performance tests intended to measure quality have been excluded from this standard.

3. DEFINITIONS

alkylbenzene: a synthetic hydrocarbon composed of a benzene ring attached to one or more saturated hydrocarbon chains.

ASTM test: a test conducted according to an ASTM International standard test procedure. This standard's developer publishes the *Annual Book of ASTM Standards*, with Parts 05.01, 05.02, 05.03, and 05.04 covering petroleum products and lubricants.

aniline point: the minimum temperature at which a lubricant is soluble in aniline, a solvent for hydrocarbons. It is used to estimate the aromatic/olefin content in a lubricant.

aromatic content: the fraction of aromatic hydrocarbon contained in a lubricant.

aromatic hydrocarbon: a hydrocarbon compound containing one or more cyclic or ring structures characterized by alternating double bonds.

cloud point: the temperature at which haziness is first observed upon cooling of a lubricant under prescribed conditions. This test is also used with refrigerant/lubricant mixtures with or without impurities.

color: the appearance of a lubricant when viewed by transmitted light.

complex ester: an ester lubricant prepared from a polyol and both mono- and dicarboxylic acids, either together or sequentially.

diester: an ester lubricant prepared from a dicarboxylic acid and monohydric alcohols.

flash point: the minimum temperature to which a lubricant must be heated under prescribed conditions in order to give off sufficient vapor to form a flammable mixture with air in the presence of an ignition source.

floc point: the highest temperature at which a mixture of lubricant and R-12 forms a distinct precipitate.

foaming: the formation of a frothy mass of refrigerant bubbles in or on the surface of a lubricant.

hydrotreated oil: a mineral oil lubricant that has been treated with hydrogen to remove aromatic and olefinic components.

kinematic viscosity: a measure of a lubricant's resistance to flow.