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CONTENTS

ANSI/ASHRAE Standard 146-1998, Method of Testing and Rating Pool Heaters

SECTION	PAGE
Foreword	
1 Purpose	1
2 Scope.....	1
3 Definitions	1
4 Classification.....	1
5 Requirements	1
6 Instruments	1
7 Apparatus	2
8 Methods of Testing	6
9 Test Procedures	7
10 Data to be Recorded.....	8
11 Calculation of Results	8
12 Reference Properties.....	9
13 References	10
Appendix A, Correction Factor for Heating Value of Fuel Gas	10
Appendix B, Concurrent Water Meter Calibration.....	10
Appendix C, Verification Test Method	10
Appendix D, Bibliography	13

(This foreword is not part of this standard but is included for information purposes only.)

FOREWORD

This standard prescribes uniform methods of testing for rating pool heaters and comes under the classification of an ASHRAE Standard Method of Measurement or Test. Unlike previously published methods of testing pool heaters, this standard applies to all pool heaters operated by gas, oil, or electricity, including heat pumps using outdoor ambient air as a heat source.

1. PURPOSE

The purpose of this standard is to provide methods of testing and rating pool heaters.

2. SCOPE

2.1 This standard provides methods of testing for heating capacity and energy efficiency.

2.2 This standard applies to heaters operated by gas, oil, or electricity, including heat pumps using outdoor ambient air as a heat source.

3. DEFINITIONS

apparatus: refers exclusively to test room facilities and instrumentation.

coefficient of performance (COP): as applied to a heat pump, the ratio of heat output in kilowatts (Btu/h) to the total power input in kilowatts (Btu/h).

coil, outdoor: the heat exchanger that absorbs heat from the outdoor air.

equipment: refers exclusively to the equipment to be tested.

heat output: the rate at which heat is passed to the water in kilowatts (Btu/h) under specified conditions of operation.

heating capacity: the rate at which heat is passed to the water in kilowatts (Btu/h) when the pool heater is operating at rated input and achieving the rated thermal efficiency or COP.

outdoor side: that part of the system that absorbs heat from a source external to the pool.

pool heater: an appliance designed for heating nonpotable water contained at atmospheric pressure, including heating water in swimming pools, spas, hot tubs, and similar applications.

rated input: energy-using capacity of a pool heater, as specified by the manufacturer and as specified in Section 8 of this standard.

standard conditions: the conditions of temperature and pressure at which the higher heating value of gas is reported, namely, 15.556°C (60°F) and 101.325 kPa (29.921 inches of mercury).

standard COP: the ratio of heat output in kilowatts (Btu/h) to total power input in kilowatts (Btu/h) as defined when equipment is operating at standard rating conditions.

standard rating conditions: the temperature and pressure conditions specified in Section 8 at which the pool heater input and efficiency are reported.

total power input: for electrical pool heaters, the total electrical input to the appliance in kilowatts.

4. CLASSIFICATION

Pool heaters are classified by energy source and include

- (a) gas-fired pool heaters;
- (b) oil-fired pool heaters;
- (c) air-to-water heat pump pool heaters employing a compressor, water-cooled condenser, and outdoor air coil in a single package assembly;
- (d) electric resistance pool heaters.

5. REQUIREMENTS

The pool heaters for which compliance with this standard is claimed shall be tested and calculations made to verify capacity and efficiency using the following procedures as appropriate:

- (a) a steady-state heating capacity test for a pool heater at standard rating conditions;
- (b) a steady-state efficiency test for gas, oil, and electric resistance pool heater or coefficient of performance (COP) for heat pump pool heater;
- (c) a standby energy consumption test for all except heat pump pool heaters.

6. INSTRUMENTS

6.1 General. Instruments are required for the following measurements with the minimum precision noted. Instruments shall be calibrated at a minimum of once a year. A record shall be kept containing, as a minimum, the date of calibration, the method of calibration, and the reference standard used.

6.2 Temperature. Temperature-measuring devices and any associated instrumentation systems shall be in accordance with *ASHRAE Standard 41.1-1986 (RA 91), Standard Method for Temperature Measurement*.¹ Measurement of water temperature shall be to an accuracy better than 1.0% of the temperature rise.

6.3 Pressure. Pressure-measuring instruments shall have errors no greater than the following:

- (a) Gas — ± 25 Pa (0.1 inch water column)
- (b) Oil — ± 3.4 kPa (0.5 pounds per square inch)
- (c) Atmospheric — ± 33.8 Pa (0.01 inch mercury)
- (d) Water — ± 6.9 kPa (1.0 pounds per square inch)

6.4 Draft. Draft gauges shall have an accuracy of ± 1.2 Pa (0.005 in. water column). Minimum divisions on the draft gauge shall be 1.2 Pa (0.005 in. water column).