

ASHRAE Standard 41.8-1989



ASHRAE[®] STANDARD

Standard Methods of Measurement of Flow of Liquids in Pipes Using Orifice Flowmeters

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**AMERICAN SOCIETY OF HEATING,
REFRIGERATING AND
AIR-CONDITIONING ENGINEERS, INC.**

1791 Tullie Circle, NE • Atlanta, GA 30329

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This is a preview of "ASHRAE 41.8-1989". [Click here to purchase the full version from the ANSI store.](#)

This foreword is not part of this Standard but is included for information purposes only.

FOREWORD

This Standard has been prepared by ASHRAE for the measurement of the flow of liquids and incorporates only Inch-Pound units. In this Standard, the customary notation is used for the description of pipe size in terms of nominal internal diameter of the pipe (inches) and pipe schedule number.

This Standard is intended to be used only where orifice meters are used in connection with the control of fluids associated with heating and air-conditioning systems, and not for custody transfer or other commercial applications covered by ANSI/API 2530 Standard, *Orifice Metering of Natural Gas and Other Related Hydrocarbon Fluids*.

1 PURPOSE

The purpose of this Standard is to establish recommended practices for the measurement of flow of liquids in pipes. It shall also establish the standard technique to be used for the calibration of other instruments more convenient to use. This Standard is not intended to be used as a replacement for the calibration of flow meters by facilities traceable to NBS or by ASME Standard *Measurement of Fluid Flow in Pipes Using Orifice, Nozzle, and Venturi*, (ASME MFC3M-1985)¹, nor restrict the use of such facilities that do not incorporate the methods outlined below.

2 SCOPE

This Standard shall apply to fluids that exist in the liquid physical state and whose thermodynamic properties are such that the fluid will remain in a complete liquid state

prior to, during, and following its path through the flow-measuring instrument.

3 DEFINITIONS

orifice meter: an assembly of a meter tube, an orifice plate, and an orifice plate holder with pressure taps for connection to a pressure differential measuring instrument, such as a manometer, for the flow rate measurement of a monophasic liquid with known properties.

For other definitions, refer to the ASHRAE dictionary, *Terminology of Heating, Ventilation, Air Conditioning and Refrigeration*.²

4 CLASSIFICATION

For the purpose of this Standard, any device, active or passive, that provides some type of physical or electrical analog response to a flowing liquid shall be considered a flowmeter.

5 REQUIREMENTS

5.1 This Standard shall be used for the calibration of other flow meters as well as used as a measurement technique during equipment tests.

5.2 As a calibration standard, a minimum of three separate readings shall be compared between the orifice and the instrument being calibrated at each flow point. Five readings are preferred to establish better statistical reliability.

6 INSTRUMENTS

6.1 Differential Pressure. The measurements of the differential pressure produced by the orifice shall be accomplished by a system which includes any of the following: a differential manometer, an indicator, or an electronic