Manual of Petroleum Measurement Standards Chapter 22.1

General Guidelines for Developing Testing Protocols for Devices Used in the Measurement of Hydrocarbon Fluids

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Suggested revisions are invited and should be submitted to the Standards Department, API, 1220 L Street, NW, Washington, DC 20005, standards@api.org.

Contents

Introduction

Various sections of API *MPMS* Chapter 22 provide testing protocols for devices used in the measurement of hydrocarbon fluids. This Chapter (22.1) is the general guideline for developing the other sections of API *MPMS* Chapter 22. A testing protocol may address the performance of the devices classified by the technology used (e.g. thermocouple, thermistor element, RTD, etc.) or by the measured parameter (e.g. temperature), irrespective of the technology used. The purpose of a testing protocol is to define appropriate methods for measuring and reporting the performance characteristics of equipment performing similar tasks; thus providing a means to highlight the relativ performance advantages and disadvantages of competing devices.

General Guidelines for Developing Testing Protocols for Devices Used in the Measurement of Hydrocarbon Fluids

1 Scope

This document is for the development of testing protocols and to serve as a guideline to document performance characteristics of hydrocarbon fluid measurement related devices.

2 Normative References

No other document is identified as indispensable or required for the application of this document.

Individual sections of this API *MPMS* Chapter may include a list of important and relevant publications available in the public domain that may describe or address the technology or technique used by the device or instrument for which the testing protocol is developed. If such a list is included, it should be comprehensive and should serve only as an additional information source for the user of the respective testing protocol document.

If the testing protocol document requires a specific test method described in a national or international standard or document (e.g. ASTM, ISO, OIML, etc.), the relevant section or sections of the reference document shall be specified and the title and year of publication of that referenced standard or document shall be listed under Normative References.

3 Terms and Definitions

All symbols and/or terms listed under the Terms and Definitions section should be consistent with API *MPMS* Chapter 1. Any symbol used in the equations, or a term used in sections of API MPMS Chapter 22 that is not defined in API *MPMS* Chapter 1 shall be defined under the Terms and Definitions section of the document. If a symbol or definition of a term in the document is different from that in API *MPMS* Chapter 1, the specific reason for the change shall be explained in the document.

4 Field of Application

The field of application of testing protocols developed under this chapter should be limited to devices that are used in the measurement of hydrocarbon fluids in the petroleum, energy, and petrochemical industries.

5 Parameter Variations Affecting Device Performance

The manufacturer shall define the meter installation requirements, operating range, limits of fluid properties, and environmental conditions for which the device is designed and/or is intended to be used. The range of conditions over which the device is to be tested shall be defined before the test is performed, because extrapolation of the process variable is not permitted for fiscal measurement beyond the range over which the performance of the device is tested. Each section of Chapter 22 developed for a specific type or class of instrument or device should define the parameters that are important for the performance evaluation of the device or instrument and list the parameters and information that should be documented in the test report.

Listed below are some of the parameters which may influence the performance of the device to be tested. For certain devices or instruments, some of the parameters listed in this section may have no influence, while there could be other parameters not listed in this section that may influence the performance of the device to be tested. If such parameters can be identified, the testing protocol should define them.

The various conditions which may affect the performance of the device may include and are not limited to:

— fluid property conditions: fluid density, viscosity, lubricity, abrasiveness, phase, phase fractions, composition, etc.;