



TECHNICAL REFERENCE Bunker mass flow metering



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Foreword

This Technical Reference (TR) was prepared by the Working Group (WG) on Mass Flow Metering appointed by the Technical Committee for Bunkering under the purview of the Chemical Standards Committee (CSC).

This TR is based on the current knowledge, extensive field trials and experience gained in the new application of Coriolis mass flow metering technology for the bunkering industry.

This TR is a provisional standard made available for application over a period of two years. The aim is to use the experience gained to update the TR so that it can be adopted as a Singapore Standard. Users of the TR are invited to provide feedback on its technical content, clarity and ease of use. Feedback can be submitted using the form provided in the TR. At the end of the two years, the TR will be reviewed, taking into account any feedback or other considerations, to further its development into a Singapore Standard if found suitable.

In preparing this TR, reference was made to the following standards:

American Petroleum Institute Manual of Petroleum Measurement Standards

API MPMS 5.6:2002(2008) Measurement of liquid hydrocarbons by Coriolis meters

American Society of Mechanical Engineers

ASME MFC-11:2006 Measurement of fluid flow by means of Coriolis mass flow meters

International Organization for Standardization

ISO 10790:1999 Measurement of fluid flow in closed conduits – Guidance to the selection, installation and use of Coriolis meters (mass flow, density and volume flow measurements)

Bureau International des Poids et Mesures

Joint Committee for Guides International vocabulary of metrology – Basic and general concepts and associated terms (VIM) 3rd Edition

International Organization of Legal Metrology

OIML D028:2004 Conventional value of the result of weighing in air

Some of the definitions in Clause 3 were reproduced from the above publications with permission from the respective organisations as indicated in brackets after the definitions. All rights are reserved by the organisations.

Acknowledgement is made for the use of information from the above publications.

At the time of publication, this Technical Reference is expected to be used by vendors of Coriolis mass flow meters, bunker suppliers, bunker surveyors, bunker tanker operators, shipowners/buyers and the implementing authority.

Attention is drawn to the possibility that some of the elements of this Technical Reference may be the subject of patent rights. Enterprise Singapore shall not be held responsible for identifying any or all of such patent rights.

Technical Reference for bunker mass flow metering

0 Introduction

This Technical Reference (TR) was developed for the benefit of the bunker industry in Singapore comprising shipowners, operators, charterers, bunker suppliers, bunker craft operators and bunker surveyors and is intended to enhance the efficiency of bunkering operations and promote best practices in the measurement of bunker fuel delivered.

The purpose of this TR is to document principles, requirements and procedures in the application of mass flow metering to bunkering in Singapore.

This TR does not alter the contractual obligations of the parties involved in the bunker delivery.

1 Scope

This TR covers the requirements of metering system qualification, installation, testing, procedures and documentation for bunker custody transfer using the Coriolis mass flow metering system.

The flowchart below shows the stages for the execution of the MFM bunkering requirements in Singapore.



2 Normative references

The following referenced documents are indispensable for the application of this TR. For undated references, the latest edition of the referenced document (including any amendments) applies, unless otherwise stated by the implementing authority.

IMO Regulations – Annex VI of MARPOL	Regulations for the prevention of air pollution from ships
ISO 8217	Petroleum products – Fuels (class F) – Specifications of marine fuels
ISO 17025	General requirements for the competence of testing and calibration laboratories
Joint Committee for Guides in Metrology JCGM 100 GUM	Evaluation of measurement data – Guide to the expression of uncertainty in measurement
International Recommendation OIML R117-1	Dynamic measuring systems for liquids other than water Part 1: Metrological and technical requirements
SS 600	Code of practice for bunkering