



# MALAYSIAN STANDARD

MS ISO 14164:2011

**STATIONARY SOURCE EMISSIONS -  
DETERMINATION OF THE VOLUME  
FLOWRATE OF GAS STREAMS IN DUCTS -  
AUTOMATED METHOD  
(ISO 14164:1999, IDT)**

**ICS: 13.040.40; 17.120.10**

Descriptors: air, quality, emissions, determination, volume flowrate, ducts, automated method

**© Copyright 2011**

**DEPARTMENT OF STANDARDS MALAYSIA**

## DEVELOPMENT OF MALAYSIAN STANDARDS

The **Department of Standards Malaysia (STANDARDS MALAYSIA)** is the national standards and accreditation body of Malaysia.

The main function of STANDARDS MALAYSIA is to foster and promote standards, standardisation and accreditation as a means of advancing the national economy, promoting industrial efficiency and development, benefiting the health and safety of the public, protecting the consumers, facilitating domestic and international trade and furthering international cooperation in relation to standards and standardisation.

Malaysian Standards (MS) are developed through consensus by committees which comprise balanced representation of producers, users, consumers and others with relevant interests, as may be appropriate to the subject at hand. To the greatest extent possible, Malaysian Standards are aligned to or are adoption of international standards. Approval of a standard as a Malaysian Standard is governed by the Standards of Malaysia Act 1996 [Act 549]. Malaysian Standards are reviewed periodically. The use of Malaysian Standards is voluntary except in so far as they are made mandatory by regulatory authorities by means of regulations, local by-laws or any other similar ways.

STANDARDS MALAYSIA has appointed **SIRIM Berhad** as the agent to develop, distribute and sell the Malaysian Standards.

For further information on Malaysian Standards, please contact:

**Department of Standards Malaysia**  
Ministry of Science, Technology and Innovation  
Level 1 & 2, Block 2300, Century Square  
Jalan Usahawan  
63000 Cyberjaya  
Selangor Darul Ehsan  
MALAYSIA

Tel: 60 3 8318 0002  
Fax: 60 3 8319 3131  
<http://www.standardsmalaysia.gov.my>

E-mail: [central@standardsmalaysia.gov.my](mailto:central@standardsmalaysia.gov.my)

OR **SIRIM Berhad**  
(Company No. 367474 - V)  
1, Persiaran Dato' Menteri  
Section 2  
40000 Shah Alam  
Selangor Darul Ehsan  
MALAYSIA

Tel: 60 3 5544 6000  
Fax: 60 3 5510 8095  
<http://www.sirim.my>

E-mail: [msonline@sirim.my](mailto:msonline@sirim.my)

**CONTENTS**

	<b>Page</b>
Committee representation .....	ii
National foreword .....	iv
Foreword .....	v
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	2
4 Measuring principles of commercially available AMS .....	3
5 Numerical performance characteristics and their applicability .....	6
6 Test report .....	6
Annex A Determination of main performance characteristics .....	7
Annex B Additional performance characteristics .....	11
Bibliography .....	13

# MS ISO 14164:2011

## Committee representation

The Industry Standards Committee on Environmental Management (ISC Z) under whose authority this Malaysian Standard was adopted, comprises representatives from the following organisations:

Association of Consulting Engineers Malaysia  
Association of Environmental Consultants and Companies of Malaysia  
Balai Ikhtisas Malaysia  
Business Council for Sustainable Development Malaysia  
Centre for Environment Technology and Development Malaysia  
Department of Environment, Malaysia  
Department of Standards Malaysia  
Environmental Management and Research Association of Malaysia  
Federation of Malaysian Manufacturers  
Malaysian International Chamber of Commerce and Industry  
Malaysian Nuclear Agency  
Malaysian Palm Oil Association  
Malaysian Palm Oil Board  
Malaysian Palm Oil Council  
Malaysian Plastics Manufacturers Association  
Malaysian Rubber Board  
Malaysian Rubber Glove Manufacturers' Association  
Malaysian Textile Manufacturers Association  
Ministry of Domestic Trade, Co-operatives and Consumerism  
Ministry of Housing and Local Government  
Ministry of International Trade and Industry  
Ministry of Natural Resources and Environment  
Ministry of Plantation Industries and Commodities  
Ministry of Science, Technology and Innovation  
SIRIM Berhad (Environmental Technology and Research Centre)  
SIRIM Berhad (Secretariat)  
The Electrical and Electronics Association of Malaysia  
The Institution of Engineers, Malaysia  
Universiti Malaya  
Universiti Putra Malaysia

The Technical Committee on Air Quality which supervised the adoption of the ISO Standard as Malaysian Standard consists of representatives from the following organisations:

Alam Sekitar Malaysia Sdn Bhd  
Association of Environmental Consultants and Companies of Malaysia  
Department of Chemistry, Malaysia  
Department of Environment, Malaysia  
Department of Occupational Safety and Health Malaysia  
Malaysian Industrial Hygiene Association  
Malaysian Meteorological Department  
Malaysian Nuclear Agency  
Ministry of Health Malaysia  
SIRIM Berhad (Secretariat)  
The Institution of Engineers, Malaysia

**Committee representation** *(continued)*

Universiti Kebangsaan Malaysia

Universiti Malaya

Universiti Putra Malaysia

The Working Group on Stationary Source Emissions which recommended the adoption of the ISO Standard as Malaysian Standard consists of representatives from the following organisations:

Alam Sekitar Malaysia Sdn Bhd

Association of Environmental Consultants and Companies of Malaysia

Department of Chemistry, Malaysia

Department of Environment, Malaysia

Environmental Science (M) Sdn Bhd

Excel Air Engineering Sdn Bhd

Federation of Malaysian Manufacturers

Ministry of Health Malaysia

SIRIM Berhad (Secretariat)

Spectrum Laboratories Sdn Bhd

The Institution of Engineers, Malaysia

TNB Research Sdn Bhd

Universiti Malaya

Universiti Teknologi Malaysia

# MS ISO 14164:2011

## NATIONAL FOREWORD

The adoption of the ISO Standard as a Malaysian Standard was recommended by the Working Group on Stationary Source Emissions under the authority of the Industry Standards Committee on Environmental Management.

This Malaysian Standard is identical with ISO 14164:1999, *Stationary source emissions - Determination of the volume flowrate of gas streams in ducts - Automated method*, published by the International Organization for Standardization (ISO). However, for the purposes of this Malaysian Standard, the following apply:

- a) in the source text, "this International Standard" should read "this Malaysian Standard";
- b) the comma which is used as a decimal sign (if any), to read as a point; and
- c) reference to International Standards should be replaced by corresponding Malaysian Standards as follows:

### Referenced International Standards

ISO 7935:1992, *Stationary source emissions - Determination of the mass concentration of sulfur dioxide - Performance characteristics of automated measuring methods*

ISO 9169:1994, *Air quality - Determination of performance characteristics of measurement methods*

ISO 10155:1995, *Stationary source emissions - Automated monitoring of mass concentrations of particles - Performance characteristics, test methods and specifications*

ISO 10780:1994, *Stationary source emissions - Measurement of velocity and volume flowrate of gas streams in ducts*

ISO 10849:1996, *Stationary source emissions - Determination of the mass concentration of nitrogen oxides - Performance characteristics of automated measuring systems*

### Corresponding Malaysian Standards

MS ISO 7935, *Stationary source emissions - Determination of the mass concentration of sulfur dioxide - Performance characteristics of automated measuring methods*

MS ISO 9169, *Air quality - Definition and determination of performance characteristics of an automatic measuring system*

MS ISO 10155, *Stationary source emissions - Automated monitoring of mass concentrations of particles - Performance characteristics, test methods and specifications*

MS ISO 10780, *Stationary source emissions - Measurement of velocity and volume flowrate of gas streams in ducts*

MS ISO 10849, *Stationary source emissions - Determination of the mass concentration of nitrogen oxides - Performance characteristics of automated measuring systems*

Compliance with a Malaysian Standard does not of itself confer immunity from legal obligations.

NOTE. IDT on the front cover indicates an identical standard i.e. a standard where the technical content, structure, and wording (or is an identical translation) of a Malaysian Standard is exactly the same as in an International Standard or is identical in technical content and structure although it may contain the minimal editorial changes specified in clause 4.2 of ISO/IEC Guide 21-1.