

JAPANESE
INDUSTRIAL
STANDARD

Translated and Published by
Japanese Standards Association

JIS A 1905-2 : 2015

Performance test of sorptive
building materials of reducing
indoor air pollution with small
chamber—Part 2: Measurement of
capability for suppressing
formaldehyde emission

ICS 13.040.20;71.040.40

Reference number : JIS A 1905-2 : 2015 (E)

PROTECTED BY COPYRIGHT

Date of Establishment: 2007-02-01

Date of Revision: 2015-03-20

Date of Public Notice in Official Gazette: 2015-03-20

Investigated by: Japanese Industrial Standards Committee
Standards Board for ISO area
Technical Committee on Architecture

JIS A 1905-2:2015, First English edition published in 2016-02

Translated and published by: Japanese Standards Association
Mita MT Building, 3-13-12, Mita, Minato-ku, Tokyo, 108-0073 JAPAN

In the event of any doubts arising as to the contents,
the original JIS is to be the final authority.

© JSA 2016

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

PROTECTED BY COPYRIGHT

Contents

	Page
Introduction	1
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Symbols and units	2
5 Principle	2
6 Apparatus	3
7 Test conditions	4
7.1 General	4
7.2 Temperature and relative humidity	4
7.3 Supply air quality and background concentration	5
7.4 Mass transfer coefficient	5
7.5 Area specific ventilation rate and air change rate	5
7.6 Formaldehyde emission source	6
8 Verification of test conditions	6
8.1 Monitoring of test conditions	6
8.2 Air tightness of chamber	6
8.3 Air change rate in test chamber	6
8.4 Efficiency of the internal test chamber air mixing	7
8.5 Recovery and sink effects	7
9 Preparation of chamber	7
10 Preparation of test specimens	7
11 Test methods	8
11.1 General	8
11.2 Background concentration and travel blank	9
11.3 Placing the test specimen in the test chamber	9
11.4 Time intervals for measurement of test chamber concentration	9
11.5 Long-term reduction performance	9
11.6 Air sampling	10
11.7 Measurement of saturation mass per area	10
12 Determination of formaldehyde	10
13 Calculation of concentration reduction effect rate and expression of results	10

14	Test report	11
Annex A (informative)	Comparison table between previous and current editions of this Standard on technically significant revisions	13

Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law.

Consequently **JIS A 1905-2:2007** is replaced with this Standard.

This **JIS** document is protected by the Copyright Law.

Attention is drawn to the possibility that some parts of this Standard may conflict with patent rights, applications for a patent after opening to the public or utility model rights. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying any of such patent rights, applications for a patent after opening to the public or utility model rights.

JIS A 1905 series consists of the following 2 parts under the general title “*Performance test of sorptive building materials of reducing indoor air pollution with small chamber*”:

Part 1: Measurement of adsorption flux with supplying constant concentration of formaldehyde

Part 2: Measurement of capability for suppressing formaldehyde emission

Performance test of sorptive building materials of reducing indoor air pollution with small chamber— Part 2: Measurement of capability for suppressing formaldehyde emission

Introduction

This Japanese Industrial Standard was established in 2007. The purpose of this revision is to re-establish consistency with a closely related standard, **JIS A 1905-1**, which has been revised to harmonize with the corresponding **ISO Standard** (originally established based on **JIS A 1905-1**) and also to correspond to revisions and establishments of other related standards for ensuring overall consistency. The comparison table between previous and current editions of this Standard on technically significant revisions is given in Annex A.

No corresponding International Standard has been established at this point.

1 Scope

This Standard specifies a general laboratory test method for evaluating the concentration reduction performance of sorptive building materials via sorption or decomposition of formaldehyde in the indoor air of a building using the chamber specified in **JIS A 1901**. The method specified in this Standard employs formaldehyde emission material to determine the sorption flux.

It is applicable to building boards, wall papers, floor materials and coating materials, and not applicable to materials capable of decomposing formaldehyde by catalytic reaction in the presence of ultraviolet and visible rays.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS A 1901 *Determination of the emission of volatile organic compounds and aldehydes by building products—Small chamber method*

JIS A 1902-1 *Determination of the emission of volatile organic compounds and aldehydes by building products—Sampling, preparation of test specimens and testing condition—Part 1: Boards, wallpaper and floor materials*

JIS A 1902-2 *Determination of the emission of volatile organic compounds and aldehydes by building products—Sampling, preparation of test specimens and testing condition—Part 2: Adhesives*

JIS A 1902-3 *Determination of the emission of volatile organic compounds and aldehydes by building products—Sampling, preparation of test specimens and testing condition—Part 3: Paints and coating materials*

- JIS A 1902-4 *Determination of the emission of volatile organic compounds and aldehydes by building products—Sampling, preparation of test specimens and testing condition—Part 4: Heat-Insulating material boards*
- JIS A 1905-1 *Performance test of sorptive building materials of reducing indoor air pollution with small chamber—Part 1: Measurement of adsorption flux with supplying constant concentration of formaldehyde*
- JIS A 1962 *Determination of formaldehyde and other carbonyl compounds in indoor air and test chamber air—Active sampling method*
- JIS A 1965 *Determination of volatile organic compounds in indoor and test chamber air by active sampling on Tenax TA® sorbent, thermal desorption and gas chromatography using MS or MS-FID*
- JIS K 0124 *General rules for high performance liquid chromatography*
- JIS K 0557 *Water used for industrial water and wastewater analysis*
- JIS Z 8703 *Standard atmospheric conditions for testing*

3 Terms and definitions

For the purpose of this Standard, the terms and definitions given in **JIS A 1901** and **JIS A 1905-1** and the following apply. The target pollutant is formaldehyde.

3.1 emission material

building material which emits formaldehyde

3.2 composite material

building material prepared by laminating a test material over an emission material and fixing with screws or nails, if the emission material is a board, or coating a test material with an emission material, if the emission material is a coating material

3.3 source

mass of formaldehyde emitted per time in a specified time from the test start

NOTE : In this Standard, this mass is calculated by multiplying the area specific emission factor q_A by the surface area of the test specimen: $S = A \times q_A$.

4 Symbols and units

For the purpose of this Standard, the symbols and units given in **JIS A 1901** and **JIS A 1905-1** and the following apply.

S : source ($\mu\text{g/h}$)

5 Principle

Performance of a test material to suppress the emission of a target pollutant is determined under steady ventilation. Determination is carried out in accordance with **JIS A 1901** using two small chambers (Chamber 1 and Chamber 2) containing respectively a target pollutant emission material and a composite material prepared by laminating the reduction performance test material over the emission material such that it covers

66 % of the emission material. Performance of the test material to suppress the emission of the target pollutant is evaluated by comparing the emission from the emission material set in Chamber 1 with that from the composite material set in Chamber 2. Also, by comparing the concentrations of volatile organic compounds (hereafter referred to as "VOC") in Chamber 1 and Chamber 2, the properties of the VOC emitted from the test material can be determined.

6 Apparatus

6.1 General

The apparatus shall be as specified in **JIS A 1901**. Principal laboratory equipment used for determination of emission factor of the target pollutant from the emission material and from the composite material shall be as follows:

- chamber;
- sealing material for test specimens;
- air purifier;
- temperature and humidity control system;
- air flow meter;
- air sampling device;
- oven;
- analytical instrument.

6.2 Chamber, complying with relevant specifications and requirements of **JIS A 1901**. See Figure 1 for outline of test chamber system. No air shall be allowed to circulate from the outlet back to the inlet.

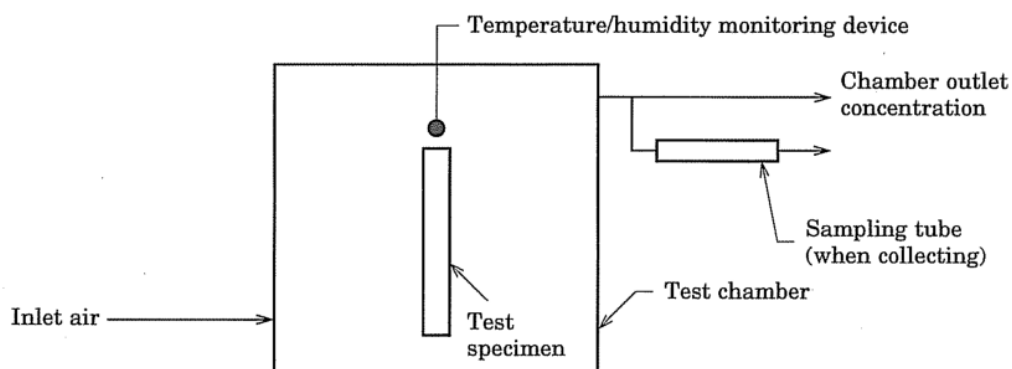


Figure.1 Outline of test chamber system

6.3 Sealing material for test specimens, such as aluminium foil to cover the edges and the back of the test specimen, if only the surface normally directly exposed to the indoor environment under intended condition of use is the subject of the test.

6.4 Air purifier The purifier shall ensure the supply air is as clean as possible. In order to prevent a rise in background concentration, an air purifier shall be provided or a cylinder of clean air shall be used.