

ISBN978-4-8189-5004-7

AIJES

**Architectural Institute of Japan
Environmental Standards**

AIJES-H0003-2013(English Version)

Standard for Diagnosing Moisture Damage in
Buildings and Implementing Countermeasures

Architectural Institute of Japan

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Architectural Institute of Japan Environmental Standards

AIJES-H0003-2013(English Version)

Standard for Diagnosing Moisture Damage in Buildings and Implementing Countermeasures

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Issued May 10, 2019

ISBN 978-4-8189-5004-7 C3052

Edited and published by Architectural Institute of Japan

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On the occasion of the publication of English Versions of Environmental Standards of the Architectural Institute of Japan (AIJES English Versions)

In 2001, Architectural Institute of Japan (AIJ) released the "Report of the Society's Criteria and Specifications Review Committee", announcing that "AIJ continues to prepare and publish standards and standard specification documents for actively addressing various problems currently faced and contributing to the sound development of architecture." It also stated that standards, criteria, and standard specifications of AIJ should have the following four roles: roles leading practical work, roles supporting legal regulations, roles as academic organizations, roles as neutral organizations.

For environmental performance experienced with the five senses in daily life, recommended standards, not legal minimum standards are necessary. These standards are used when users experience the environmental performance levels of a building and practitioners realize the environmental performance required by the users. It is important for AIJ to publish new academic achievements and technological developments as the recommended environmental standards.

Under such a background, the Research Committee on Environmental Engineering has been working on "Environmental Standards of the Architectural Institute of Japan" (AIJES) with affiliated committees which have examined performance items, performance standards, verification methods, and so on.

As of 2019, the Japanese versions of the AIJES have been published for each environmental field. It has been decided that translated English versions will be published at a future date.

These specified in the English versions standards shall become the first step towards raising expectations for the improvement of the building environment and conservation of the global environment.

With the publication of the English versions of the AIJES, the Committee on Environmental Engineering would like to express sincere gratitude to everyone concerned in various fields including the members who assisted the work, and the Committee asks for further cooperation in the global implementation of the AIJES.

AIJ Research Committee on Environmental Engineering

Purpose and basic policy of establishing Environmental Standards of the Architectural Institute of Japan (AIJES)

- (1) AIJ establishes "Environmental Standards of the Architectural Institute of Japan" and publishes it for society. These standards are "environmental standards for buildings and cities" defined by the Research Committee on Environmental Engineering of AIJ, and are referred to as "Environmental Standards of Architectural Institute of Japan" (AIJES). Symbols for target environmental fields and numbers in the order of publication for each field are given.
- (2) The purpose of establishing AIJES is to show academic criteria for judging the environment of buildings and cities based on the Code of Conduct and Ethics Guidelines of AIJ, and to take the leading role in relevant legal standards. Based on this purpose, it is expected that researchers, clients, designers, supervisors, constructors, and administrative officers will share knowledge about AIJES.
- (3) The scope of the application of AIJES covers all environments of buildings and cities, and it covers all levels such as urban environment, environment around buildings, building environment, indoor environment, local environment, and micro-environment around the human body.
- (4) AIJES shall be defined by the terms "standards", "norms", "specifications", and "guidelines". The definition of these terms basically follows the provisions of AIJ; however, in AIJES, "standards" is used to represent the whole.
- (5) AIJES shall demonstrate the academic judgment standards of AIJ with objectivity and foresight, logic and ethics, regionality and internationality, and flexibility and consistency, while maintaining neutrality and fairness.
- (6) The content shall be thereby agreed upon and accepted by consensus of the members of AIJ. AIJES shall include performance items such as safety, health, comfort, energy saving, resource saving / recyclability, environmental compatibility, welfare and so on.
- (7) The contents of AIJES are applied at each stage of planning, designing, construction, completion and operation of buildings, and shall include criteria concerning categories such as performance values, calculation method, construction method, inspection method, test method, measurement method, evaluation method and so on.
- (8) AIJES shall consider such classifications as the minimum level (acceptable value), recommended level (recommended value), and target level (target value) to define the environmental level.
- (9) AIJES shall be revised as necessary in consideration of, among other factors, the progress of science and technologies and the changes in social conditions that affect its contents.
- (10) In principle, AIJES shall conform to various laws and regulations and public rules as it is based on the premise that it is applied to actual cities and buildings.
- (11) Where possible, AIJES shall maintain a consistent system among different environmental fields.

Preface

This document has been prepared for contributing to building design and management by indicating the countermeasures against the moisture damage occurring in buildings and the framework to prevent moisture damages based on the past examples.

The term “moisture damage” is often understood differently between the experts on buildings and the users. This difference causes confusions. From this viewpoint, the document provides the definition of “moisture damage” in buildings and the standards to diagnose whether a phenomenon should be classified as a moisture damage or not.

Despite the accumulation of knowledge to prevent hygrothermal problems in buildings, the moisture damage has not been eradicated. The variety in the conditions, the kinds of the phenomena, and the lifestyle of the occupants combines to make it difficult to prevent moisture damages. A tool that enables a multifaceted judgment based on the past examples is necessary for the true prevention of moisture damages. For this purpose, this document provides also the methodology of classifying the moisture damages, the framework of clarification of the cause, and the countermeasures against the moisture damage.

Many pages are devoted to the collection of the past samples of moisture damages in buildings. The examples mainly collected from literatures are organized and classified in a table, which is designed in order to make it easy for the reader to look up relevant examples to learn from the past errors and to obtain information for the countermeasures against the moisture damages. The collection in this document is a basis to establish a complete collection in the future, and therefore more examples should be added and the table should be improved in light of the up-to-date circumstances of architecture, at the future revision of this document.

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2. Scope

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3. Terminology

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4. Moisture damage definition and diagnosis

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5. Classification of moisture damage

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6. Investigation into and prevention against moisture damage

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Satoru Takada, Masayuki Imanaka

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Masayuki Imanaka

Supplement 2: Categorization of condensation damages and the solutions to them

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Supplement 3: Awareness of moisture damage among residents of housing

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1. Purpose

This standard defines moisture damage in buildings and demonstrates criteria for diagnosing whether the phenomenon that occurs in a building is moisture damage or not. It will also demonstrate methods for the classification and organization of examples of moisture damage and present a framework for investigating and countering moisture damage based on examples.

The term “moisture damage” is interpreted in many different ways. In particular, cognizance of moisture damage is not always consistent between specialists (engineers, researchers, etc.), residents and building users which lead to confusion. For example: residents and building users would consider the occurrence of condensation on window glass or on the surface of a metal sash to be a prime example of moisture damage, but considering the durability of glass and metal materials, it is not always appropriate to call that “moisture damage.” However, it should be called moisture damage when mold growth on the curtains is attributed to the condensation on the glass. It is imperative to resolve the confusion due to definition of “moisture damage” and to present the criteria for diagnosing whether an occurring phenomenon in a building is moisture damage or not.

In addition, climate conditions around a building, the structure and function, and residential lifestyle are very diverse. As a result, the locations of moisture damage occurrence, the processes that lead up to it, and the harmful effects that it brings are varied. It is neither easy to investigate the cause when moisture damage occurs, nor to take measures against and prevent it. Along with offering classification methods and organizing examples of moisture damage, it is important to propose a framework for example-based investigation, countermeasures to support investigation, and countermeasures to prevent moisture damage.

This standard presents common definitions and diagnosing standards of moisture damage to unify the understanding between residents, buildings users and specialists. Furthermore, it better classifies and organizes moisture damage and provides a framework for investigating and taking measures against it. This is a standard that summarizes the points that should be taken into account in building design and used in order to prevent moisture damage.

2. Scope

The following shows the scope covered in this standard:

1. Building damage that is induced by (gaseous/liquid/solid) water.
2. Damage to building components and its resulting damage to humans and properties stored in the building.
3. Damage to buildings for every kind of use, e.g. residences, factories and warehouses.
4. Does not cover warranties for building damage.

There are cases when moisture damage may be derived from the vapor in the outdoor air, the vapor generated by residents in the building, or from rain and domestic water. Design, construction, and management should prevent rain and pipe leak occurrences after completion, however when moisture damage does occur, they should be checked first. On the other hand, although basic design, construction, and management methods are almost established for moisture damage from vapor, there are varying factors related to damage prevention, requiring systemized organization of diagnostic methods. This standard includes rain leaks and other phenomena resulting from liquid. The chapter on moisture damage investigation and prevention methods focuses on compiling information regarding phenomena derived from vapor.