SINGAPORE STANDARD

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Materials and performance tests for aluminium curtain walls

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SINGAPORE STANDARD

MATERIALS AND PERFORMANCE TESTS FOR ALUMINIUM CURTAIN WALLS

FOREWORD

This Singapore Standards was prepared by the Technical Committee for Curtain Walls under the direction of the Building Materials Product Standards Committee.

This standard stipulates the technical requirements for the essential materials and evaluation methods for checking the structural adequacy of aluminium curtain walls and their ability to resist water penetration and air leakage.

The performance of the curtain wall systems as an effective barrier against water penetration, air leakage and its structural integrity is dependent upon the technical design and engineering and detailing of the curtain wall system. The objective of the performance evaluation in the laboratory is to check the compliance of the system against the design, and in the course of doing that weakness, if any, in the design may be revealed. In obtaining a good aluminium curtain wall, proper installation is just as important as intelligent design and good fabrication.

The specification for infill panels are not laid down in this standard in view of the diverse variety of available materials.

In preparing this specification, reference was made to the following publications :

1. ASTM E 283 - 91 : Standard test method for determining the rate of air leakage through exterior windows, curtain walls, and doors under specified pressure differences across the specimen

2. ASTM E 330 - 90 : Standard test method for structural performance of exterior windows, curtain walls, and doors by uniform static air pressure difference

3. ASTM E 331 - 86 : Standard test method for water penetration of exterior windows, curtain walls, and doors by uniform static air pressure difference

4 SS 212 : 1988 : Specification for aluminium alloy windows

5. Standard and guide to good practice for curtain walling by Centre for Windows and Cladding Technology University of Bath, UK

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

NOTE

1. Singapore Standards are subject to periodical review to keep abreast of technological changes and new technical developments. The revisions of Singapore Standards are announced through the issue of either amendment slips or revised editions.

2. Compliance with a Singapore Standard does not exempt users from legal obligations.

1. SCOPE

This Singapore Standard specifies materials and performance standards for aluminium curtain walls. The performance standard includes only tests for air permeability, watertightness and structural performance.

This standard may involve hazardous materials, operations, and equipment. This standard does not intend to address all of the safety problems associated with their use. It is the responsibility of whoever uses this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. DEFINITIONS

2.1 Curtain Wall. It is a wall acting as a primary barrier to protect the building interior against air infiltration, water penetration, wind and sound.

2.2 Sealant. An elastomeric material with adhesive qualities that joins components of a similar or dissimilar nature to provide an effective barrier against the passage of air and water.

2.3 Specifying Authority. Architect, designer, engineer, contracting officer who has the authority to amend and/or approve any change to the design.

2.4 Design Wind Pressure. Wind pressure for the design of curtain wall. The pressure shall be determined in accordance with BS CP 3 : Chapter V : Part 2 or other wind design code acceptable to the authority or by boundary layer wind tunnel tests.

2.5 Air Permeability. The property of a closed test specimen to let air pass when it is subject to a differential pressure. The air permeability is characterized by a flow of air expressed in m^3/h as a function of the pressure. This flow may be related to the opening surface area of the test specimen (flow per unit of surface $m^3/h/m^2$), or to the length of opening joint (flow per unit of length $m^3/h/m$), or to the total surface area of the test specimen (flow per unit of surface $m^3/h/m^2$).

2.6 Pressure Difference (Pa). The specified differential static air pressure across the specimen. The difference is positive when the external pressure is higher than the internal pressure. It is negative when the external pressure is lower than the internal pressure.

2.7 Opening Light. Any part of the test specimen that can be moved within the main frame. By convention, the surface of the opening light is equal to the apparent surface, seen from inside. The length of the joints is obtained from the same dimensions as those used for calculation of the surface area.

2.8 Fixed Light. Any part of the test specimen that is fixed in position.

2.9 Test Load. The design wind pressure (unless otherwise specified) both positive and negative for which the specimens to be tested, expressed in Pascals.

2.10 Permanent Deformation. The permanent displacement from an original position that remains after an applied load has been removed.