



Pathways between worlds

*by Tomoyuki Katsuno, Chair
of ISO/TC 162, Doors and
windows*

Doors and windows are indispensable in housing and wherever people go in and out of places, as in commercial buildings or public facilities like schools or hospitals. Although, from a structural architecture perspective, doors and windows are not regarded as core fundamentals, they are the most critical building components for keeping our life space safe, healthy and comfortable.

Just think of the difference the presence of a window can make in a room or the importance of doors for keeping houses secure. On the other hand, imagine yourself in a wheelchair and trying to pass through an entrance that is just a bit too narrow, or on a cold winter day and trying to keep warm in a room whose windows are not well insulated.

Let the light in, keep the rain out

The essential functions of doors and windows involve security, habitability, weather-ability and operability. In our everyday lives, doors and windows are tightly linked to user accessibility, daylight illumination, opening and closing motions and ventilation, among others. As such, they are pathways that connect the living interior with the building's exterior.

Located at the very boundary between these two worlds, doors and windows are directly exposed to external weather conditions. Notwithstanding, their key role is to securely protect the residents' living space under all circumstances, keeping them safe and sound within their dwellings. Doors and windows are thus vital and perhaps constitute the most influential construction element for our daily life.

One sure way to ensure that doors and windows have the qualities needed to successfully perform their role is through the application of ISO standards, which can contribute to improving our comfort no matter where our doors and windows are installed.

Opening doors worldwide

ISO/TC 162, *Doors and windows*, is the technical committee responsible for developing standards on these construction elements. As doors and windows are directly exposed to human behaviour and the natural environment, the committee takes safety, security, comfort and durability into consideration at all times. Their aim is that the standards ensure that we can feel safe and comfortable no matter where we go.

In particular, the committee encourages the standardization of evaluation measures for verifying the fundamental performances and accessory hardware of doors and windows. These tests are necessary to:

- maintain product quality;
- ensure product safety under all weather conditions; and
- guarantee security during product operation.



In other words, the committee promotes the standardization of methods for determining the performance of doors and windows under diverse meteorological conditions (e.g. gusty wind or rainfall), and various mechanical strengths under static loads, repetitions of opening and closing, torsion and impact, among others. With global standards in these areas, the elementary qualities of doors and windows can be assessed using the same tests method everywhere in the world.

Japan, the current Secretariat for the committee, is coordinating the development of these ISO standards, with excellent cooperation from CEN members and taking the progress of EN standards into account. ISO/TC 162's standardiza-

tion activity does not address any specific areas; rather, it tries to be as comprehensive as possible. Accordingly, the circumstances of all countries are being considered, and, in particular, where meteorological conditions might be especially harsh for doors and windows.

Below are two examples of recently published standards that contribute to our safety and comfort.

Beware of cyclones



The first is ISO 15821:2007, *Doorsets and windows – Water-tightness test under dynamic pressure – Cyclonic aspects*. This standard is used to determine whether

a door or window can prevent rainwater coming from typhoons, hurricanes or cyclones from penetrating into our living space. The test uses an apparatus which reproduces similar natural phenomena, which simultaneously brings both violent rainfalls and stormy winds. If rainwater should permeate indoors under such severe weather conditions, the habitability and sustainability of a building would be dangerously affected.

ISO 15821 is increasingly relevant today, as the areas susceptible to such stormy weather are expanding as a result of global warming. Therefore, this test method will become progressively more important and applicable universally, helping us protect our safety and ensure our comfort under difficult circumstances.

When the earth shakes



The second example is a test standard focussed on earthquakes, which these days occur frequently across the planet. During an earthquake, it is critical that residents can quickly leave their quarters without risking being locked in. Under those conditions, lives depend on doors being available for exit.

ISO 15822:2007, *Test method of doorset opening performance in diagonal deformation – Seismic aspects*, provides a test method to assess whether a door can be securely released in an emergency such as an earthquake. Although it is difficult in itself to make door-frames sufficiently quake-resistant, their performance should at least follow quaking movements in such a way that they permit residents to evacuate a building from the inside.



About the author



Tomoyuki Katsuno is Director of the Japan Testing Center for Construction Materials, Central Laboratories. He has long been in charge of overall man-

agement of tests and investigations, and researches in respect to solid-state performance, built environment, structure, and fire-prevention/fire-resistance of construction materials. He continues to be engaged in the work of product standardization and test methods for openings of doors and windows as an expert committee member of architectural technology of JISC, thus contributing to overall standards for the Japanese building industry. Since 2005, Mr. Katsuno is the Chair of ISO/TC162, *Doors and windows*.

These two new standards are not only significant for areas struck by frequent typhoons, hurricanes, cyclones and earthquakes, but will also become crucial for the livability and sustainability of buildings, and a safeguard of human life in wider areas.

Secure and accessible to all

Social aging is a worldwide phenomenon. More and more, people are suffering from physical inconveniences and disability. It is therefore a matter of high priority for ISO to develop friendly standards for aged and disabled people.

Security and burglar resistance issues are now also of great concern. ISO therefore needs to promptly provide relevant standards for doors, windows and accessory hardware against house-breaking.

“Doors and windows are the most critical building components for keeping our life space safe, healthy and comfortable.”

As building components, doors and windows are in continuous interaction with meteorological conditions and human behaviour. It is important that they are constantly improved with state-of-the-art technology in order to be on par with users' requirements. Likewise, ISO's international standardization activities need to satisfy contemporary needs keeping with technological developments, to continue to ensure the necessary qualities and performances of these elements. ■