

## Glass standards address quality and performance

by Valerie L. Block, Secretary of ISO/TC 160, Glass in building, SC 2, Use considerations

**A**rchitectural glass is an integral part of buildings due to its functionality and aesthetic appeal. A wide range of glass products brings energy efficiency, sound control, security, and safety to residential and commercial buildings. ISO/TC 160, *Glass in building*, is developing standards that address the quality of glass products and the use of these products to achieve a specified level of performance.

One of the first ISO/TC 160 standards, developed under the Vienna Agreement, was ISO 12543, Parts 1-6, on laminated glass. Laminated glass consists of

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two pieces of glass bonded together by an interlayer material. From basic definitions and descriptions in part 1 to test methods for durability in part 4, these standards promote uniformity and give users a valuable tool for ensuring consistent, high-quality laminated glass.

The Convenor of the working group on laminated glass, Dr. Norbert Wruk of Pilkington, says, “the development of the ISO 12543 standard series was not straightforward, because different standards for impact testing existed in various parts of the world. But finally I believe we found a satisfactory solution for everybody. Meanwhile, working Group 3 has even finished the revised ISO/DIS 12543 standard series, which will be published for enquiry shortly.”

Working groups are currently developing ISO standards for basic glass, toughened glass, coated glass, mirrors, and curved glass.

### New test methods to demonstrate glass performance

ISO/TC 160 has published several standards that help to demonstrate glass performance through testing programs specifically designed for end-use applications. ISO 22897 on glazing and airborne sound sets a common framework for product descriptions and properties of acoustical glazing. ISO 16940 further enables the user to measure the mechanical impedance of laminated glass.

### “A typical solution to the energy challenge is to specify glass in insulating units.”

ISO 16936, parts 1-4, is focussed on forced-entry security glazing tests. The test methods, which include a repetitive ball drop and a hammer and axe test, allow the user to identify the test method that most closely resembles the threat scenario. Other standards for bullet resistance (ISO 16935) and destructive windstorm resistance (ISO 16932) testing create uniform test protocols and acceptance criteria.

According to Convenor Dr. John Turnbull, a consultant in the United States,

“the ISO security standards have worldwide relevance. For example, the standard on windstorm resistance can apply equally in Asia and in the Caribbean. This test method promotes a safer environment and protects people and property in severe weather areas.”

### Standards for energy-efficient glass products

While acoustical performance and security are critical elements in building design, from a practical perspective, a quiet, safe environment promotes employee satisfaction and a more pro-

ductive work environment. The use of glass in windows, facades, storefronts and skylights also brings more daylight into the interior of a building – potentially reducing energy consumption. Energy conservation strategies often include high performance glass for this purpose, and also afford building occupants a view to the outside.

A typical solution to the energy challenge is to specify glass in insulating units. These products contain one or two air spaces to reduce heat loss. ISO/TC 160 addresses insulating glass in ISO/DIS 20492, parts 1-4. The working group Convenor, A. William Lingnell of Lingnell Consulting Services reports, says, “our working group has developed test methods that evaluate insulating glass performance. These test methods examine the durability and physical attributes of edge seals, chemical fogging, and gas concentration and gas leakage. Part of our strategy in standards development around insulating glass is to give testing options – thus serving different regional needs.”

### “Quality standards are essential in promoting understanding on expectations and quality.”

Another ISO/TC 160 standard in development concerns coated glass. Under Convenor Dr. Richard Blacker of Guardian Industries, work is progressing on a two-part standard. Part 1 will define the optical and aesthetic qualities of high-performance coatings applied to glass through pyrolytic and vacuum

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### About the author



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deposition processes. These coatings are typically used to control solar heat gain, energy performance and condensation, and to enhance building aesthetics. Part 2 describes a method for allowing an objective evaluation of the colour of coated glass.

## Promoting global use of glass

The development of standards has enabled glass experts from different countries to share information and work together to create ISO standards that bring the best information forward during the development process. In today's economic environment, glass and fabricated glass products are shipped from one region to the next with ease. Quality standards are essential in promoting an understanding around expectations and finished quality. Additionally, performance standards are key to the proper specification and use of glass for safety, security, sound control, and energy management.

Homes, apartment buildings, office buildings, shopping malls, schools, concert halls, and many other types of buildings continue to incorporate glass to enhance the aesthetic appeal of the building and to provide important benefits to occupants. The standards of ISO/TC 160 are designed to support the continued use of glass well into the future. ■

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