Introduction.

At the National Bureau of Standards' (NBS) Center for Building Technology (CBT), safety research is concerned with reducing the hazards of life and property during the construction and the use of buildings. CBT building safety research is pursued through a multidisciplinary approach. Its products include performance requirements, criteria and test methods, retrofit recommendations, and design guides. They are used by owners, architects, and engineers in designing, constructing, and operating buildings. Results of CBT safety research are made available to the general public. This information provides the technical basis for improved building safety.

Research at CBT includes analytical, laboratory, and field activities. This work is supported by such Federal agencies as the Department of Housing and Urban Development, the Consumer Product Safety Commission, the Occupational Safety and Health Administration, the Department of Justice and the National Bureau of Standards.

The projects noted briefly describe NBS research in building safety.

Research Activities.

Stairs. CBT has evaluated stairs and their use to provide an understanding of the causes of stair accidents. Over 465,000 stair-related injuries are treated in U.S. emergency rooms each year. Recommendations presented by CBT to the Consumer Product Safety Commission include cautions against using distracting patterned carpet, guides for providing proper lighting, and suggestions for placement and selection of handrails. Separate recommendations for new construction and for upgrading existing buildings are being developed.

Slippery Surfaces. CBT research has led to the development of a portable tester for measuring the slip-resistance of surfaces, such as bathtubs, floor surfaces and stairs.

The device is being used to establish standards for flooring materials to control slipperiness. The tester can be taken to locations of slip accidents where measured values can be correlated with incidents. The American Society for Testing and Materials adopted the tester for use in establishing a bathtub and shower safety standard. Additional research will be conducted to develop a universal calibration procedure for all slip-resistance testers.

Doors and Windows. CBT developed criteria and test methods to evaluate the resistance of doors and windows to common burglary attacks. Doors present the primary opportunity for entrance by burglars. In addition, doors are among the ten most hazardous consumer products. Research sponsored by the Department of Justice has resulted in two National Institute of Law Enforcement and Criminal Justice (NILECJ) standards: "Physical Security of Door Assemblies and Components" and "Physical Security of Window Units." The method developed for the NILECJ door standard was incorporated in the American National Standards Institute/American Society for Testing and Materials standard, "Standard Test Methods for Security of Swinging Door Assemblies," which is being promulgated by ASTM.

Glass. Non-safety glass that is used in buildings may result in an unreasonable risk of injury,
Concrete Construction. CBT is also working on criteria for safe design, erection, and removal of formwork for concrete building construction. Researchers are evaluating the strength gain characteristics of concrete at early ages using nondestructive test methods for determining the strength of concrete and determining the formwork strength as affected by field conditions.

Visual Alerting Standardization. CBT is attempting to further the development of a nationally unified system of safety color codes for signs, signals, labels, and markings used in buildings. CBT is acting as the secretariat for the American National Standards Institute committees on "Safety Color Code for Marking Physical Hazards" and "Accident Prevention Signs and Tags." This involvement includes standardization and coordination—among government, industry, standards organizations, and the public—of visual alerting systems for use in and around buildings.

Electrical. CBT is developing for the Department of Housing and Urban Development criteria for electrical circuits that will eliminate shock hazards and insure fire safety. The technical data from this research will be provided to the National Fire Protection Association for incorporation into future revisions of the National Electric Code.

Mobile Home Egress. For the Department of Housing and Urban Development, CBT is studying the operating characteristics of hatches and windows to determine if they are effective as emergency exits.
Selected Publications.


