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Interconnecting Panel Systems and Supported Components

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NATIONAL STANDARD OF CANADA **CAN/CGSB-44.229-2008**

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INTERCONNECTING PANEL SYSTEMS AND SUPPORTED COMPONENTS

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Supersedes CAN/CGSB-44.229-2002

CANADIAN GENERAL STANDARDS BOARD

INTERCONNECTING PANEL SYSTEMS AND SUPPORTED COMPONENTS

1. SCOPE

1.1 This standard provides dimensional and performance requirements for safety, durability and structural adequacy of interconnecting panels and panel-supported components such as work surfaces, drawers and storage units. Panels may have the capability for management of electrical and communications wiring as well as acoustical properties.

1.2 This standard also provides dimensional and adjustment requirements that respect generally accepted ergonomics guidelines or standards, such as those of CAN/CSA-ISO 9241-5-00, using NATICK/TR-89/044, 1988 as its source of anthropometric data.

1.2.1 The dimensional and adjustment requirements aim to address the estimated needs of the 5th to 95th percentile of adult office workers when in the seated position.

1.3 The selected methods for measuring interconnecting panels and panel-supported components and for assessing their performance are based on the actual field and product-testing experience of the members of the Canadian General Standards Board Committee on Interconnecting Panel Systems and Supported Components.

1.4 Quantities and dimensions used in this standard are given in metric units with imperial equivalents shown in brackets where appropriate. The metric units shall be regarded as official in the event of dispute.

1.5 The testing and evaluation of a product against this standard may require the use of materials and/or equipment that could be hazardous. This document does not purport to address all the safety aspects associated with its use. Anyone using this standard has the responsibility to consult the appropriate authorities and to establish appropriate health and safety practices in conjunction with any applicable regulatory requirements prior to its use.

2. REFERENCED PUBLICATIONS

2.1 The following publications are referenced in this standard:

2.1.1 National Research Council of Canada (NRC)

National Building Code of Canada (NBCC).

2.1.2 Canadian Standards Association (CSA)

CAN/CSA-ISO 9241-5-00 — Ergonomic Requirements for Office Work with Visual Display Terminals (VDTs) — Part 5: Workstation Layout and Postural Requirements

C22.2 No. 9.0 — General Requirements for Luminaires

C22.2 No. 12 — Portable Luminaires

C22.2 No. 203 — Modular Wiring Systems for Office Furniture.

2.1.3 American Association of Textile Chemists and Colorists (AATCC)

EP 1 — Gray Scale for Color Change.

2.1.4 American National Standards Institute (ANSI)/BIFMA International

ANSI/BIFMA X5.6-2003 — Panel Systems — Tests.

2.1.5 American National Standards Institute (ANSI)/National Electrical Manufacturers Association (NEMA)

ANSI/NEMA LD 3-2005 — High-Pressure Decorative Laminates.

2.1.6 ASTM International

C 297-04 — Standard Test Method for Flat Tensile Strength of Sandwich Constructions

C 423-07 — Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method

D 523-89(1999) — Standard Test Method for Specular Gloss

D 3359-02 — Standard Test Methods for Measuring Adhesion by Tape Test

D 3363-05 — Standard Test Method for Film Hardness by Pencil Test

D 4060-01 — Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser

E 90-04 — Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

E 413-04 — Standard Classification for Rating Sound Insulation.

2.1.7 Association for Contract Textiles (ACT)

Performance Guidelines.

2.1.8 BIFMA International

G1-2002 — Ergonomics Guideline For VDT (Visual Display Terminal) Furniture Used In Office Work Spaces.

2.1.9 International Organization for Standardization (ISO)

ISO/IEC 17025 — General requirements for the competence of testing and calibration laboratories.

2.1.10 Underwriters Laboratories Inc. (UL)

UL 1286 — Standard for Office Furnishings.

2.1.11 U.S. Army Natick Research, Development and Engineering Center

NATICK/TR-89/044, 1988 — Anthropometric Survey of U.S. Army Personnel: Methods and Summary Statistics.

2.2 A dated reference in this standard is to the issue specified. An undated reference in this standard is to the latest issue, unless otherwise specified by the authority applying this standard. The sources are given in the Notes section.

3. TERMINOLOGY

3.1 The definitions in ANSI/BIFMA X5.6-2003 and the following apply in this standard:

Articulating Keyboard Support Surface (Support articulé pour clavier)

A vertically and horizontally continuously user-adjustable support surface for a computer keyboard, mouse and other input devices where the adjustment is provided by a jointed or segmented arm providing retractability of the support surface complete with keyboard and mouse below the primary work surface to which it is attached.

Cable Pathway (Chemin de câbles V/D)

A facility for the placement of voice/data cabling.

Cableway (Parcours de câbles)

A space that can contain raceways and cable pathways.

NRC (NRC)

Noise reduction coefficient.

Panel (Cloison)

A flat or curved surface that controls and defines space, provides privacy and a means for supporting components.

Raceway (Canalisation)

An enclosed channel of metal or non-metallic materials designed expressly for holding wires, cables or busbars, with additional functions. Raceways include, but are not limited to, rigid metal conduit, rigid non-metallic conduit, intermediate metal conduit, liquid-tight flexible conduit, flexible metallic tubing, flexible metal conduit, electrical non-metallic tubing, electrical metallic tubing, underfloor raceways, cellular concrete floor raceways, cellular metal floor raceways, surface raceways, wireways and busways.

Roll-out Keyboard Support Surface (Support coulissant pour clavier)

A horizontally user-adjustable work surface or tray that is used to support a computer keyboard and, in some instances, to provide space for a mouse.

STC (ITS)

Sound transmission class.

Substrate (Substrat)

An underlying core or layer that can be laminated, coated or veneered.

4. GENERAL REQUIREMENTS

4.1 **Tolerances** — Unless otherwise specified, the tolerances on test equipment, measuring equipment and loading devices, shall be as follows:

a. Test weights, ±5%

b. Forces, velocities and time, ±5%

c. Linear measurements, ±1.5 mm (1/16 in.)

d. Angles, ±5°

e. Levels, within 5 mm per metre (1/16 in. per linear foot)

f. Cycles, all requirements are minimums.

Test weights, forces, dimensions, angles, time, rates and velocities shall be targeted at the nominal values specified.

4.2 **Workmanship** — The assembled components shall be uniform in quality, style, material and workmanship and shall be clean and free from any defects that may affect appearance, serviceability or safety. When assembled in any of the manufacturer's recommended configurations, there shall be no unfinished edges or surfaces other than stainless steel when viewed in normal use positions. Metal edges, corners and parts with which the user is intended to come in contact shall be rounded or covered with protective caps. Lubricated parts, excluding drawer and roll-out keyboard shelf slides, shall be protected against accidental contact with the user, the user's clothes or documents. Wood core surfaces shall have a balanced construction to minimize warping.

4.3 **Finish** — The specified finish (par. 10.1 a.) shall meet the requirements of Table 1. All exposed aluminum components shall be anodized, painted or otherwise treated to prevent oxidation.

4.4 **Welds** — All welds shall be structurally sound, free from cracks and surface voids. They shall be clean, smooth, uniform in appearance and free from scale, flux, trapped foreign matter or any other inclusions that may be detrimental to the application of the primer or final finish.

4.5 **Safety** — Fixed, movable or adjustable parts shall be constructed so that they cannot unintentionally become loose, dislodged or cause personal injury.

4.6 **Clearance Between Adjusting Surfaces** — The clearance between a vertical user-adjustable surface and any adjacent surface shall not be less than 25 mm (1 in.). A clearance less than 8 mm (0.3 in.) is acceptable where the clearance is maintained throughout the travel of the adjusting surface. Articulating keyboard support surfaces are exempt from this requirement.

4.7 **Wood** — All visible solid wood shall be free from open knots.

4.8 **Cord and Cable Management** — When specified (par. 10.1 b.), the system shall provide cord and cable management capability. When specified (par. 10.1 b.), reusable covers shall be provided for each grommet to conceal the openings when not in use.

4.9 **Edges** — All work surface edges that are designed for a user to rest the forearm or wrist shall have a radius of at least 3 mm (0.12 in.).

4.10 **Recycled Material** — No limit is imposed on the amount of recycled material used in the manufacture of new components, and manufacturers are encouraged to use recyclable materials whenever possible and applicable. Where possible, all major plastic components should carry a composition code to facilitate recycling. The finished components shall meet all requirements of this standard.

4.11 **Work Surface Clearances** — There shall be a clearance envelope under all work surfaces 610 mm (24 in.) in depth or greater, which shall meet the requirements of BIFMA G1-2002 for the 95th percentile male, except that the depth at toe level shall be 584 mm (23 in).

4.11.1 For height-adjustable work surfaces, the range of adjustments shall include the clearance envelope for the 95th percentile male, as specified in par. 4.11.

TABLE 1

Performance Requirements for Finishes[1]

Type of Finish	Gloss Max.	Finish Hardness Min.	Abrasion Resistance Max.	Colour Stability Max.	Paint Adhesion Min.	Impact Resistance
	Par. 5.1	Par. 5.2	Par. 5.3	Par. 5.4	Par. 5.5	Par. 5.6
Horizontal Work Surfaces						
High pressure laminate	45	NA	0.02 g at 500 cycles, 1000 g load	Grey Scale 4	NA	No cracking at 762 mm (30 in.)
Low pressure laminate	45	NA	0.04 g at 500 cycles, 1000 g load	Grey Scale 4	NA	No cracking at 254 mm (10 in.)
Wood veneer	45	NA	NA	NA	NA	NA
Painted wood	45	2H	0.04 g at 500 cycles, 1000 g load	Grey Scale 4	NA	No cracking at 254 mm (10 in.)
Other finishes[2]	45	NA	NA	Grey Scale 4	NA	No cracking at 254 mm (10 in.)
Other Surfaces (excluding fabrics and trim finishes)						
Laminates	45	NA	0.04 g at 500 cycles, 1000 g load	Grey Scale 4	NA	NA
Wood veneer	45	NA	NA	NA	NA	NA
Painted wood	45	H	0.04 g at 500 cycles, 1000 g load	Grey Scale 4	NA	NA
Painted (non-wood)	45	H	0.04 g at 500 cycles, 1000 g load	Grey Scale 4	4B	NA

[1] *NA means the test does not apply to the specified type of finish.*
[2] *Other finishes include, but are not limited to, vinyl- and leather-wrapped surfaces.*

5. DETAILED REQUIREMENTS FOR FINISHES

5.1 **Gloss** — Unless otherwise specified (par. 10.1 c.), the 60° specular gloss of work surfaces, when tested in accordance with ASTM D 523-89(1999), shall not exceed the specified requirement.

5.2 **Finish Hardness** — The finish, when tested in accordance with ASTM D 3363-05, "scratch hardness" method, shall not be less than the specified requirement.

5.3 **Abrasion Resistance** — The loss of finish, when tested in accordance with ASTM D 4060-01, using a CS-10 wheel (with a 1000 g load), shall not exceed the specified requirement.

5.4 **Colour Stability** — The finish, after exposure, when tested in accordance with ANSI/NEMA LD 3-2005, section 3, shall not show a change in colour greater than grey scale 4 contrast by reference to AATCC EP1.

5.5 **Paint Adhesion** — The adhesion rating of the painted metal finish, when tested in accordance with ASTM D 3359-02, Method B, shall be as specified.

5.6 **Impact Resistance** — Impact resistance, when tested in accordance with ANSI/NEMA LD 3-2005, shall comply with the specified requirement, with the following exceptions:

a. The test substrate shall be the material to be used for the manufacturer's work surfaces.

b. Trim and edging that may project onto the work surface are exempt from these requirements.

6. DETAILED REQUIREMENTS FOR COMPONENTS

6.1 Panels

6.1.1 The width and height shall be specified (par. 10.1 d.). The design of the panel assembly shall ensure that sagging of the core material does not occur.

6.1.2 ***Structural Support Frame*** — The structural support frame shall be accurately cut, fitted and fastened to produce a rigid assembly.

6.1.3 ***Trim*** — All exposed panel edges must be finished. If a finished edge of a panel (tops, ends, corner-linking devices, etc.) is not integrated into the design of the panel, the system shall provide it (panel tops, panel end trims, corner covers, etc.), as specified (par. 10.1 e.).

6.1.4 ***Fabric*** — Unless otherwise specified (par. 10.1 f.), the fabrics shall meet the requirements of the ACT *Performance Guidelines* for panel upholstery.

6.1.5 ***Glazing Materials Used in Panels*** — The glazing materials used in glazed panels shall meet the requirements of UL 1286, section 27.

6.1.6 ***Flexible Panel Hinges*** — The flexible panel hinges shall meet the requirements of UL 1286, section 28.

6.1.7 ***Glides*** — All panels shall be equipped with or share two glides that have a corrosion-resistant surface in contact with the floor. The glides shall have a minimum surface area of 5 cm^2 (0.8 sq. in.), shall not exceed the width of the panel, and shall have a vertical adjustment of at least 38 mm (1.5 in.). They shall be secured so that they cannot become loose or detached while in use, but shall be accessible and removable for adjustment or replacement.

6.1.8 ***Cable Pathways*** — When specified (par. 10.1 g.), panels shall have integral cable pathways for the distribution of voice and data cables. Cable pathways shall have removable, reusable or hinged covers for easy access. Cable pathways may be located at the base, near the desk height, or at the top of the panel. Cable pathways shall provide capacity for cabling associated with telephone service and one or more data communications networks for a typical work area. The cable pathway may be designed so that the vendor's standard electrical system may be installed into the cable pathway.

6.1.9 ***Electrical Wiring*** — When specified (par. 10.1 h.), provision for and placement of electrical wiring shall be supplied. Electrical wiring shall be in a raceway. Communication cabling may be placed in the same cableway. The electrical system shall be rated 125 V, 15 or 20 A. The complete electrical system in the panels and all components shall comply with CSA C22.2 No. 203.

6.1.10 ***Acoustical Capability***

6.1.10.1 The panels shall be non-acoustical or have acoustical properties, as specified (par. 10.1 i.).

6.1.10.2 *Acoustical Panels* — Unless otherwise specified (par. 10.1 j.), acoustical panels 1525 mm (60 in.) or greater in height shall have an NRC rating of at least 0.65 when tested in accordance with ASTM C 423-07, and a minimum STC rating of 20 when tested in accordance with ASTM E 90-04[1] and ASTM E 413-04.

6.1.11 ***Flammability of Finished Panels*** — The finished panels (core, adhesive, frame, joining components and decorative fabric type) shall meet the requirements for flame spread rating and smoke developed index of the *National Building Code of Canada.*

Note: *For panels upholstered in 100% polyester fabric, including fabrics with up to 100% recycled content, only one fabric weight needs to be tested to cover the whole range of weight and percentage of recycled content.*

6.1.12 ***Mounting Systems*** — The panels shall have mounting systems on which components can be hung at varying heights on both sides of the panel. Mounting systems shall be slotted for component attachment at vertical increments of no more than 30 mm (1.2 in.). There shall be no see-through gaps in the vertical slotted uprights after installation.

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[1] *ASTM E 413-04 is required in addition to this test method to fully describe STC.*

6.1.13 ***Connector System*** — The connector system shall be capable of joining panels of varying widths and heights and shall be capable of connecting two, three or four panels at a junction. When specified, a wall mount connector shall be available to be connected to walls. Wiring and cabling shall pass easily around corners or connectors.

6.2 **Work Surfaces**

6.2.1 ***Dimensions*** — The width and depth dimensions shall be specified (par. 10.1 k.).

6.2.2 ***User-adjustable*** — When specified (par. 10.1 l.), work surfaces shall be capable of continuous height adjustment over a range of at least 150 mm (6 in.) and shall be capable of including a height range of 660 to 737 mm (26 to 29 in.) as part of the range. User-adjustable work surfaces, when tested in accordance with ANSI/BIFMA X5.6-2003, section 10.18, shall show no loss of serviceability.

6.2.3 ***Supports*** — The work surface shall be supported as specified (par. 10.1 m.). Each support that rests on the floor shall have a levelling mechanism with a vertical adjustment that is at least equal to that of the range of the height adjustment slots (par. 6.1.12) but not less than 25 mm (1.0 in.).

6.2.4 ***Deflection*** — The work surface, when tested in accordance with par. 8.4, shall deflect no more than its length divided by 180 (L/180).

6.2.5 ***Adhesives*** — The adhesives used to apply plastic laminates shall achieve a tensile strength of 449 kPa (65 psi) when tested in accordance with ASTM C 297-04. The plastic laminate, adhesive and test substrate shall be the materials to be used in the manufacturer's work surfaces.

6.2.6 ***Controls*** — Work surfaces offering continuous adjustment capability shall be operable from the usual working position and shall not require the use of any unsupplied tools. Controls used to effect continuous adjustments shall have adequate clearance to permit the user to make the adjustment. Hand-crank adjustable surfaces shall not require more than 50 N (12 lbf.) to operate. This measurement shall be taken with the surfaces loaded as specified in section 10.18 of ANSI/BIFMA X5.6-2003, both before and after the cycle test specified in section 22.2.

6.3 **Keyboard Support Surface**

6.3.1 ***Dimensions*** — The keyboard support surface shall be as wide as specified (par. 10.1 n.) to support the intended input devices.

6.3.2 ***Adjustment*** — The keyboard support surface shall be capable of being locked into a position where the bottom of the keyboard support surface is even with the bottom surface of the work surface. It shall have a minimum adjustment range of 100 mm (4 in.) downward from that position and shall be lockable throughout its adjustment range. When specified (par. 10.1 o.), other features shall be provided such as tilt adjustment and its specified tilt range, specific size for type of keyboard to be accommodated, and provision for a mouse, resilient palm rest or non-slip surface.

6.3.3 ***Roll-out Keyboard Support Surface*** — The roll-out keyboard support surface shall have a minimum of 55 mm (2.2 in.) clearance under the work surface, or as specified[2] (par. 10.1 p.). It shall engage in the fully extended position so that a deliberate action is required to move it into the stowed position. The surface shall be capable of accommodating commercially available standard keyboards in the extended or the recessed position. When specified (par. 10.1 p.), the roll-out keyboard support surface shall also accommodate a mouse on one side of the keyboard.

6.4 **Transaction Surface Dimensions** — The width and depth dimensions shall be specified (par. 10.1 q.).

6.5 **Pedestals** — The pedestals shall be work surface supporting or work surface suspended, as specified (par. 10.1 r.).

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[2] *Because of the variation in keyboard designs, the minimum clearance of* 55 mm *(2.2 in.) may not accommodate some non-standard keyboards. Therefore, special clearance requirements should be agreed upon between the specifying authority and the manufacturer.*

6.6 **Drawers**

6.6.1 ***Types*** — The drawers shall be either box or file type, as specified (par. 10.1 s.).

6.6.1.1 *File Drawers* — The file drawers shall be designed to accommodate both legal- and letter-sized filing systems with minimal adjustment. All file drawers shall have full bottoms unless otherwise specified (par. 10.1 t.). Each file drawer shall be provided with at least two removable dividers, a hanging-file rail system or one compressor, as specified (par. 10.1 t.). The drawer shall fully extend, allowing complete vertical access to usable clear space. The drawer slides shall be corrosion resistant.

6.6.1.2 *Box Drawers* — The drawer slides shall be corrosion resistant. The drawer shall extend at least three quarters of its full length.

6.6.2 ***Pencil Trays*** — When specified (par 10.1 u.), the top box drawer shall have a movable pencil tray that extends from one side of the inside of the drawer to the other.

6.6.3 ***Usable Space*** — All box and file drawers shall have a usable interior depth of at least 65% of the pedestal exterior depth. File drawers shall be at least 235 mm (9.2 in.) in height as measured from the top of the drawer edge or file hanger bar, whichever is used to support file folders. The top of the drawer edge or file hanger bar must allow at least 15 mm (0.6 in.) of clearance to the top of the drawer opening.

6.6.4 ***Bumpers*** — All drawer assemblies shall have resilient bumpers to minimize the noise of impact when drawers reach the end of their inward and outward travel.

6.6.5 ***Stops*** — All drawers shall have stops to prevent their accidental removal, but the drawers shall be removable when required.

6.6.6 ***Pulls*** — The pulls shall be designed so that the drawer can be operated effectively. Recessed or extended pulls shall have adequate finger clearance.

6.7 **Panel-mounted Cabinets and Storage Units**

6.7.1 ***General*** — The cabinets shall be available in the width specified and shall have a minimum interior clearance of 305 mm (12 in.) in height and depth, unless otherwise specified (par. 10.1 v.). The type of door (hinged, sliding [including tambour closures], receding, folding, etc.) or the absence of doors shall be specified (par. 10.1 v.).

6.7.2 ***Deflection*** — The shelf surface, when tested in accordance with par. 8.4, shall deflect no more than its length divided by 180 (L/180).

6.7.3 ***Overhead Storage Units*** — When specified (par. 10.1 w.), overhead storage units shall be designed to accommodate task lighting on the underside of the shelf above the work surface.

6.7.4 ***Durability of Doors*** — Sliding (including tambour closures) and hinged doors, when tested in accordance with ANSI/BIFMA X5.6-2003, shall not show structural damage or loss of serviceability.

6.8 **Shelves** — Shelf width shall be as specified. Shelf depth shall be at least 305 mm (12 in.) in depth unless otherwise specified (par. 10.1 x.).

6.9 **Task Light Fixtures** — When specified (par. 10.1 y.), task light fixtures shall be provided; the type of fixture and the type of mounting shall be as specified. Light fixtures shall comply with CSA 22.2, No. 9.0 or No. 12, as applicable. They shall be equipped with an on/off switch and a diffusion lens to reduce glare. When specified (par. 10.1 y.), the intensity of the light shall be adjustable.

6.10 **Locks** — When specified (par. 10.1 z.), combination or key-activated locks shall be supplied for doors and drawers. When specified (par. 10.1 z.), the requested number of different key-lock combinations and quantities shall be provided. Any additional lock requirements shall be specified (par. 10.1 z.). Two keys per lock will be provided. Lock mechanisms shall have adequate clearance to permit the user to operate the lock. The design of key-activated locks shall require a key to activate the locking mechanism.

6.11 **Modesty Panels** — When specified (par. 10.1 aa.), work surfaces shall be equipped with a modesty panel. The modesty panel shall be flush with the edge of the work surface or recessed, as specified (par. 10.1 aa.).

6.12 **Tackable Surfaces** — When specified (par. 10.1 bb.), tackable surfaces shall be provided. The force to insert the pushpin shall be no greater than 36 N (8.0 lbf.) when tested in accordance with par. 8.5.1. The pushpin must support a 0.45 kg (1.0 lb.) load without pulling free from any of the locations where it was inserted when tested in accordance with par. 8.5.2.

6.13 **Panel-supported Accessories** — When specified (par. 10.1 cc.), accessories shall be provided.

7. PREPARATION FOR DELIVERY

7.1 Unless otherwise specified (par. 10.1 dd.), preparation for delivery shall conform to normal commercial practice.

8. TESTING

8.1 **Sampling** — Sampling for inspection and testing shall be left to the discretion of the inspection authority unless a specific sampling plan is specified (par. 10.1 ee.).

8.2 ISO/IEC 17025 requirements for reporting uncertainty do not apply when determining conformance to this standard.

8.3 Panel systems and supported components shall meet the applicable acceptance levels specified in ANSI/BIFMA X5.6-2003 unless other tests are specified.

8.4 **Horizontal Surface Deflection Test** — Load the surface in accordance with ANSI/BIFMA X5.6-2003 functional distributed load. Average the height of the end points and subtract the height of the centre. The resulting dimension shall be the deflection.

8.5 **Tackable Surface Tests**

8.5.1 ***Insertion Force Test*** — Obtain a complete tackable surface and a pushpin with a length of 12.7 mm (0.5 in.) and a diameter of no more than 1.3 mm (0.05 in.). Using a force gauge, measure and record the maximum force required to push the pin. Repeat the test at five different locations and report the average of the test results.

8.5.2 ***Hanging Strength Test*** — Obtain a complete tackable surface and a pushpin with a length of 12.7 mm (0.5 in.) and a diameter of no more than 1.3 mm (0.05 in.). Insert the pin. Attach a vertical hanging load of 0.45 kg (1lb.) for 60 s before withdrawing the pin. Repeat the test at five different locations.

8.6 **Test Report** — As a minimum, the test report shall be in accordance with the requirements of ANSI/BIFMA X5.6-2003.

9. MARKING

9.1 Panels and all components that consist of primary, secondary or dedicated surfaces shall be permanently and legibly marked with the manufacturer's name or recognized trademark.

9.2 **Operating Instructions** — User-adjustable products shall be provided with pictorial or written (French and English) instructions or both.

10. NOTES

10.1 **Options** — The following options must be specified in the application of this standard:

a. Type of finish (par. 4.3)

b. Whether cord and cable management shall be provided, and if so, whether a reusable cover shall be provided for each grommet (par. 4.8)

c. Whether the specular gloss for surfaces shall be other than as specified (par. 5.1)

d. Width and height of panel (par. 6.1.1)

e. Type of trim (par. 6.1.3)

f. Whether the fabric need not meet the requirements of the ACT *Performance Guidelines* (par. 6.1.4)

g. Whether integral cable pathways are required (par. 6.1.8)

h. Whether provision and placement of electrical wiring is required (par. 6.1.9)

i. Whether panels shall be non-acoustical or have acoustical properties (par. 6.1.10.1)

j. Whether acoustical panels over 1525 mm (60 in.) in height shall have a NRC rating greater than 0.65 and a STC rating greater than 20 (par. 6.1.10.2)

k. Width and depth of work surfaces (par. 6.2.1)

l. Whether work surfaces shall have a continuous height adjustment capability, and a capability of including a height range of 660 to 737 mm (26 to 29 in.) (par. 6.2.2)

m. Type of support for work surfaces (par. 6.2.3)

n. The width of the keyboard support surface (par. 6.3.1)

o. Other features for the adjustable keyboard support surface (par. 6.3.2)

p. Whether the roll-out keyboard support surface shall have a minimum clearance of other than 55 mm (2.2 in.) and whether it shall accommodate a mouse on one side of the keyboard (par. 6.3.3)

q. Width and depth of transaction surface (par. 6.4)

r. Whether pedestals shall be work surface supporting or work surface suspended (par. 6.5)

s. Type of drawer (par. 6.6.1)

t. Whether a full bottom for each drawer is not required and whether each file drawer requires at least two removable dividers, a hanging-file rail system or one compressor (par. 6.6.1.1)

u. Whether a pencil tray is required (par. 6.6.2)

v. Width of cabinets; height and depth, if other than 305 mm (12 in.); type of door for cabinets or absence of doors (par. 6.7.1)

w. Whether the overhead storage units shall accommodate task lighting (par. 6.7.3)

x. Width of shelves and depth if other than 305 mm (12 in.) (par. 6.8)

y. Whether a task light fixture is required, and if so, the type of fixture, the type of mounting and whether it shall be capable of adjusting the intensity of the light (par. 6.9)

z. Whether locks shall be supplied for doors and drawers and, if supplied, whether the locking action is a combination or key, the number of different key-lock combinations and quantities, and any additional lock requirements (par. 6.10)

aa. Whether modesty panels are required and whether they shall be flush with the edge of the work surface or recessed (par. 6.11)

bb. Whether tackable surfaces are required (par. 6.12)

cc. Whether panel-supported accessories are required (par. 6.13)

dd. Preparation for delivery, if other than normal commercial practice (par. 7.1)

ee. Sampling plan, if other than as specified (par. 8.1)

10.2 **Sources of Referenced Publications**

10.2.1 The publication referred to in par. 2.1.1 may be obtained from the National Research Council Canada, Publication Sales, M-20, Institute for Research in Construction, 1200 Montreal Road, Ottawa, Ontario K1A 0R6, telephone 613-993-2463 or 1-800-672-7990, fax 613-952-7673, e-mail IRCpubsales@nrc-cnrc.gc.ca, Web site www.nrc-cnrc.gc.ca.

10.2.2 The publications referred to in par. 2.1.2 may be obtained from the Canadian Standards Association, Standards Sales, 5060 Spectrum Way, Suite 100, Mississauga, Ontario L4W 5N6, telephone 416-747-4044 or 1-800-463-6727, fax 613-747-2510, e-mail sales@csa.ca, Web site www.csa.ca.

10.2.3 The publication referred to in par. 2.1.3 may be obtained from the American Association of Textile Chemists and Colorists, P.O. Box 12215, 1 Davis Drive, Research Triangle Park, NC 27709, U.S.A., telephone 919-549-8141, fax 919-549-8933, Web site www.aatcc.org.

10.2.4 The publication referred to in par. 2.1.4 may be obtained from the American National Standards Institute, 25 West 43rd Street, New York, NY 10036, U.S.A., telephone 212-642-4980, fax 212-398-0023, Web site www.ansi.org, or from BIFMA International, 2680 Horizon Drive S.E., Suite A-1, Grand Rapids, MI 49546-7500, U.S.A., telephone 616-285-3963, fax 616-285-3765, e-mail email@bifma.org, Web site www.bifma.org.

10.2.5 The publication referred to in par. 2.1.5 may be obtained from the American National Standards Institute, 25 West 43rd Street, New York, NY 10036, U.S.A., telephone 212-642-4980, fax 212-398-0023, Web site www.ansi.org, or from the National Electrical Manufacturers Association, 1300 North 17th Street, Suite 1752, Rosslyn, Virginia, VA 22209, U.S.A., telephone 703-841-3200, fax 703-849-5100, Web site www.nema.org.

10.2.6 The publications referred to in par. 2.1.6 may be obtained from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, U.S.A., telephone 610-832-9500, Web site www.astm.org, or from IHS Canada, 1 Antares Drive, Suite 200, Ottawa, Ontario K2E 8C4, telephone 613-237-4250 or 1-800-267-8220, fax 613-237-4251, e-mail gic@ihscanada.ca, Web site canada.ihs.com.

10.2.7 The publication referred to in par. 2.1.7 may be obtained from the Association for Contract Textiles, Headquarters, P.O. Box 101981, Forth Worth, TX 76185, U.S.A., telephone 817-924-8050, Web site www.contracttextiles.org.

10.2.8 The publication referred to in par. 2.1.8 may be obtained from BIFMA International, 2680 Horizon Drive S.E., Suite A-1, Grand Rapids, MI 49546-7500, U.S.A., telephone 616-285-3963, fax 616-285-3765, e-mail email@bifma.org, Web site www.bifma.org.

10.2.9 The publication referred to in par. 2.1.9 may be obtained form IHS Canada, 1 Antares Drive, Suite 200, Ottawa, Ontario K2E 8C4, telephone 613-237-4250 or 1-800-267-8220, fax 613-237-4251, e-mail gic@ihscanada.ca, Web site canada.ihs.com.

10.2.10 The publication referred to in par. 2.1.10 may be obtained from Comm 2000, 1414 Brook Drive, Downers Grove, IL 60515, telephone 415-352-2168, fax 1-888-853-3512, Web site www.comm-2000.com, or from IHS Canada, 1 Antares Drive, Suite 200, Ottawa, Ontario K2E 8C4, telephone 613-237-4250 or 1-800-267-8220, fax 613-237-4251, e-mail gic@ihscanada.ca, Web site canada.ihs.com

10.2.11 The publication referred to in par. 2.1.11 may be obtained from the U.S. Army NATICK Research, Development and Engineering Center, Natick, MA 01760-5000, U.S.A.