Government of Canada
Gouvernement du Canada

Canadian General Standards Board
Office des normes générales du Canada

CAN/CGSB-44.229-2017

Supersedes CAN/CGSB-44.229-2008

National Standard of Canada

Interconnecting panel systems and supported components

Canadian General Standards Board CGSB

Standards Council of Canada
Conseil canadien des normes

Canada

Experience and excellence
Expérience et excellence
CGSB ONGC

The CANADIAN GENERAL STANDARDS BOARD (CGSB), under whose auspices this standard has been developed, is a government agency within Public Services and Procurement Canada. CGSB is engaged in the production of voluntary standards in a wide range of subject areas through the media of standards committees and the consensus process. The standards committees are composed of representatives of relevant interests including producers, consumers and other users, retailers, governments, educational institutions, technical, professional and trade societies, and research and testing organizations. Any given standard is developed on the consensus of views expressed by such representatives.

CGSB has been accredited by the Standards Council of Canada as a national standards-development organization. The standards that it develops and offers as National Standards of Canada conform to the criteria and procedures established for this purpose by the Standards Council of Canada. In addition to standards it publishes as National Standards of Canada, CGSB produces standards to meet particular needs, in response to requests from a variety of sources in both the public and private sectors. Both CGSB standards and CGSB national standards are developed in conformance with the policies described in the CGSB Policy and Procedures Manual for the Development and Maintenance of Standards.

CGSB standards are subject to review and revision to ensure that they keep abreast of technological progress. CGSB will initiate the review of this standard within five years of the date of publication. Suggestions for their improvement, which are always welcome, should be brought to the notice of the standards committees concerned. Changes to standards are issued either as separate amendment sheets or in new editions of standards.

An up-to-date listing of CGSB standards, including details on latest issues and amendments, and ordering instructions, is found in the CGSB Catalogue at our Web site — www.tpsgc-pwgsc.gc.ca/ongc-cgsb/index-eng.html along with more information about CGSB products and services.

Although the intended primary application of this standard is stated in its Scope, it is important to note that it remains the responsibility of the users of the standard to judge its suitability for their particular purpose.

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. CGSB neither assumes nor accepts any responsibility for any injury or damage that may occur during or as the result of tests, wherever performed.

Attention is drawn to the possibility that some of the elements of this Canadian standard may be the subject of patent rights. CGSB shall not be held responsible for identifying any or all such patent rights. Users of this standard are expressly advised that determination of the validity of any such patent rights is entirely their own responsibility.

Language
In this Standard, "shall" states a mandatory requirement, "should" expresses a recommendation and "may" is used to express an option or that which is permissible within the limits of this Standard. Notes accompanying clauses do not include requirements or alternative requirements; the purpose of a note accompanying a clause is to separate from the text explanatory or informative material. Annexes are designated normative (mandatory) or informative (non-mandatory) to define their application.

Further information on CGSB and its services and standards may be obtained from:

The Manager
Standards Division
Canadian General Standards Board
Gatineau, Canada
K1A 1G6

A National Standard of Canada is a standard developed by an SCC-accredited Standards Development Organization (SDO), and approved by the Standards Council of Canada (SCC), in accordance with SCC's: *Requirements and Guidance-Accreditation for Standards Development Organizations, and Requirements and Guidance-Approval of National Standards of Canada Designation*. More information on National Standard requirements can be found at www.scc.ca.

An SCC-approved standard reflects the consensus of a number of experts whose collective interests provide, to the greatest practicable extent, a balance of representation of affected stakeholders. National Standards of Canada are intended to make a significant and timely contribution to the Canadian interest.

SCC is a Crown corporation within the portfolio of Industry Canada. With the goal of enhancing Canada's economic competitiveness and social well-being, SCC leads and facilitates the development and use of national and international standards. SCC also coordinates Canadian participation in standards development, and identifies strategies to advance Canadian standardization efforts. Accreditation services are provided by SCC to various customers, including product certifiers, testing laboratories, and standards development organizations. A list of SCC programs and accredited bodies is publicly available at www.scc.ca.

Users should always obtain the latest edition of a National Standard of Canada from the standards development organization responsible for its publication, as these documents are subject to periodic review.

The responsibility for approving standards as NSCs rests with:

Standards Council of Canada
55 Metcalfe Street, Suite 600
Ottawa, Ontario K1P 6L5, CANADA

NATIONAL STANDARD OF CANADA **CAN/CGSB-44.229-2017**

Supersedes CAN/CGSB-44.229-2008

Interconnecting panel systems and supported components

CETTE NORME NATIONALE DU CANADA EST DISPONIBLE EN VERSIONS FRANÇAISE ET ANGLAISE.

ICS 97.140

Published September 2017 by the
Canadian General Standards Board
Gatineau, Canada K1A 1G6

CANADIAN GENERAL STANDARDS BOARD

Committee on Interconnecting Panel Systems and Supported Components

(Voting membership at date of approval)

Chair (Non-voting)

Parratt, B.	Independent consultant (General interest)

General interest category

Comtois, M.	Micom Laboratories Inc.
Panning, D.	BIFMA International
Stables, L.	Workplace Safety and Insurance Board

Producer category

Barbeau, J.	Arto Pex Plus
Barber, P.	Compx Waterloo
Brochu, J.	Teknion Limited
Carmona, P.	Correctional Service Canada (CORCAN)
Dykstra, T.	Haworth Inc.
Musculus, J.	Steelcase Inc.
Ruster, R.	Herman Miller Inc.
Worthy, K.	Global Contract Inc.

User category

Bach, A.	Canada Revenue Agency
Dewling, D.	Government of Newfoundland and Labrador
Reid, A.	Public Services and Procurement Canada

Secretary (Non-voting)

Panu-Anghel, C.	Canadian General Standards Board

Acknowledgment is made for the translation of this National Standard of Canada by the Translation Bureau of Public Services and Procurement Canada.

Contents

Page

Interconnecting panel systems and supported components

1 Scope

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.

This standard also provides dimensional and adjustment requirements that respect generally accepted ergonomics guidelines, reports or standards, such as those of CAN/CSA-ISO 9241-5-00(R2016), BIFMA G1-2013, CAESAR FINAL REPORT Vol. I and II, June 2002 as its source of anthropometric data. Designing products to meet the dimensional needs of the 5th percentile female to the 95th percentile male will accommodate a large number of users. It is important, however, to realize that furniture for the above range may not accommodate at least 5 % of the users for any particular dimension. In order to accommodate user dimensions outside the 5th to 95th percentile ranges, it may be necessary to purchase additional products to meet unique individual needs.

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.

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.

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.

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 Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of this National Standard of Canada. The referenced documents may be obtained from the sources noted below.

NOTE The addresses provided below were valid at the date of publication of this standard.

An undated reference is to the latest edition or revision of the reference or document in question, unless otherwise specified by the authority applying this standard. A dated reference is to the specified revision or edition of the reference or document in question.

2.1 Canadian Standards Association (CSA)

CAN/CSA-ISO 9241-5-00(R2016) — *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*.

2.1.1 Source

The above may be obtained from CSA Group, Standards Sales, 178 Rexdale Blvd., Toronto, Ontario M9W 1R3 Canada. Telephone 416-747-4044 or 1-800-463-6727. Fax 416-747-2510. E-mail sales@csagroup.org. Web site www.shopcsa.ca.

2.2 National Research Council of Canada (NRC)

National Building Code of Canada 2015 (NBC).

2.2.1 Source

The above 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.

2.3 American Association of Textile Chemists and Colorists (AATCC)

EP 1 — *Gray Scale for Color Change*.

2.3.1 Source

The above 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, or from IHS Markit, 200-1331 MacLeod Trail SE, Calgary, Alberta T2G 0K3, telephone 613-237-4250 or 1-800-267-8220, fax 613-237-4251, Web site www.global.ihs.com.

2.4 American National Standards Institute (ANSI)/BIFMA

ANSI/BIFMA X5.6-2016 — *Panel Systems — Tests*.

2.4.1 Source

The above 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 the above may be obtained from BIFMA, 678 Front Avenue NW, Suite 150 Grand Rapids, MI 49504-5368, U.S.A., telephone 616-285-3963, e-mail email@bifma.org, Web site www.bifma.org.

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

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

2.5.1 Source

The above 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 22209, U.S.A., telephone 703-841-3200, fax 703-849-5100, Web site www.nema.org.

2.6 Association for Contract Textiles (ACT)

Performance Guidelines.

2.6.1 Source

The above 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, fax 817-924-8048, Web site www.contracttextiles.org.

2.7 ASTM International

C297-15 — *Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions*

C423-09a — *Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method*

D523-14 — *Standard Test Method for Specular Gloss*

D3359-09e2 — *Standard Test Methods for Measuring Adhesion by Tape Test*

D3363-05 (2011)e2 — *Standard Test Method for Film Hardness by Pencil Test*

D4060-14 — *Standard Test Method for Abrasion Resistance of Organic Coatings by the Taber Abraser*

E90-09 — *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*

E413-16 — *Standard Classification for Rating Sound Insulation*.

2.7.1 Source

The above may be obtained from ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, U.S.A., telephone 610-832-9585, fax 610-832-9555, Web site www.astm.org, or from IHS Markit, 200-1331 MacLeod Trail SE, Calgary, Alberta T2G 0K3, telephone 613-237-4250 or 1-800-267-8220, fax 613-237-4251, Web site www.global.ihs.com.

2.8 BIFMA

BIFMA G1-2013 — *Ergonomics Guideline For Furniture Used In Office Work Spaces Designed For Computer Use*.

2.8.1 Source

The above may be obtained from BIFMA, 678 Front Avenue NW, Suite 150 Grand Rapids, MI 49504-5368, U.S.A., telephone 616-285-3963, e-mail email@bifma.org, Web site www.bifma.org.

2.9 International Organization for Standardization (ISO)

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

2.9.1 Source

The above may be obtained from IHS Markit, 200-1331 MacLeod Trail SE, Calgary, Alberta T2G 0K3, telephone 613-237-4250 or 1-800-267-8220, fax 613-237-4251, Web site www.global.ihs.com.

2.10 National Technical Information Service (NTIS)

CAESAR Final Report Vol.I
Civilian American and European Surface Anthropometry Resource (CAESAR) Final Report, Vol.I, Experimental Designs and Data Description, June 2002.

CAESAR Final Report Vol.II
Civilian American and European Surface Anthropometry Resource (CAESAR) Final Report, Vol.II Detailed Methodology and Descriptions, June 2002.

2.10.1 Source

The above may be obtained from NTIS, 5301 Shawnee Road, Alexandria, VA 22312, telephone 1-800-553-6847 or (703) 605-6900, fax (703) 605-6880, e-mail: orders@ntis.gov, Web site www.ntis.gov.

2.11 Underwriters Laboratories Inc. (UL)

UL 1286 — *Standard for Office Furnishings*.

2.11.1 Source

The above 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 Markit, 200-1331 MacLeod Trail SE, Calgary, Alberta T2G 0K3, telephone 613-237-4250 or 1-800-267-8220, fax 613-237-4251, Web site www.global.ihs.com.

3 Terms and definitions

For the purposes of this National Standard of Canada, the terms and definitions in ANSI/BIFMA X5.6- 2016 and the following terms and definitions apply.

3.1
articulating keyboard support surface
keyboard support surface offering continuous vertical adjustment by the user for a computer keyboard, mouse and other input devices that is supported by a single jointed or segmented arm providing retractability of the keyboard support surface complete with keyboard and mouse below the surface to which it is installed.

3.2
box drawer
drawers designed to store miscellaneous loose office supplies and personal items. Drawer has a nominal height of 152 mm (6 in.). Often referred to as “box height”.

3.3
cable pathway
facility for the placement of voice/data cabling.

3.4
cableway
space that can contain raceways and cable pathways.

3.5
continuous adjustment
adjustment to any setting within a mechanical range of adjustment operable by the user in the usual upright working position without the use of unsupplied tools.

3.6
file drawer
drawers designed to accommodate paper files, nominal height 305 mm (12 in.) described as letter height.

3.7
incremental adjustment
adjustment to a specified number of predefined settings within a mechanical range of adjustment.

3.8
lateral file drawer
a file drawer with width greater than its depth.

3.9
NRC
noise reduction coefficient.

3.10
panel
flat or curved surface that controls and defines space, provides privacy and a means for supporting components.

3.11
pencil drawer
drawers designed to accommodate small office supplies such as writing instruments, nominal height 80 mm (3 in.).

3.12
raceway
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.

3.13
STC
sound transmission class.

3.14
substrate
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) All cycle 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 suitable construction to minimize warping.

4.3 Finish

The specified finish (see 10 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 (see 10 b), the system shall provide cord and cable management capability. When specified (see 10 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 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 G1-2013 for the 95th percentile male, except that the depth at toe level shall be 584 mm (23 in.).

4.10.1 For height-adjustable work surfaces, the range of adjustments shall include the clearance envelope for the 95th percentile male, as specified in 4.10.

4.10.2 Clearance under adjacent work surfaces

Where two work surfaces at least 610 mm (24 in.) in depth are adjacent, the supports shall have a minimum recess of 330 mm (13 in.) measured from the front of the supports closest to the working edge. This measurement shall apply throughout the range of 50 mm (2 in.) to 610 mm (24 in.) from the floor. If the support incorporates glides, the glides are to be fully recessed for this measurement.

5 Detailed requirements for finishes

Table 1 — Performance requirements for finishes

Type of finish	Gloss Max.	Finish hardness Min.	Abrasion resistance Max.	Colour stability Max.	Paint adhesion Min.	Impact resistance
	See 5.1	See 5.2	See 5.3	See 5.4	See 5.5	See 5.6
Horizontal work surfaces						
High pressure laminate	45	NA[a]	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[b]	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

[a] NA means the test does not apply to the specified type of finish.

[b] Other finishes include, but are not limited to, vinyl- and leather-wrapped surfaces.

5.1 Gloss

Unless otherwise specified (see 10 c), the 60° specular gloss of work surfaces, when tested in accordance with ASTM D523-14, shall not be greater than the specified requirement.

5.2 Finish hardness

The finish, when tested in accordance with ASTM D3363-05 (2011) e2, “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 D4060-14, 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 D3359-09 e2, 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 (see 10 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 shall 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 (see 10 e).

6.1.4 Fabric

Unless otherwise specified (see 10 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 1286-2008, section 35.

6.1.6 Flexible panel hinges

The flexible panel hinges shall meet the requirements of UL 1286-2008, section 36.

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 thickness 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 (see 10 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 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 (see 10 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 (see 10 i).

6.1.10.2 Acoustical panels

Unless otherwise specified (see 10 j), acoustical panels 1525 mm (60 in.) or greater in height shall have an NRC rating of at least 0.50 when tested in accordance with ASTM C423-09a, and a minimum STC rating of 15 when tested in accordance with ASTM E90-09[1] and ASTM E413-16.

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* or ANSI/BIFMA X5.6-2016 Panel Systems ─ Tests.

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.

[1] ASTM E413-16 is required in addition to this test method to fully describe STC.

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.

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 (see 10 k).

6.2.2 User-adjustable

When specified (see 10 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 mm to 737 mm (26 to 29 in.) as part of the range. Incremental work surfaces shall be adjustable in increments of no more than 25 mm (1.0 in.).

6.2.3 Supports

The work surface shall be supported as specified (see 10 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 (see 6.1.12) but not less than 25 mm (1.0 in.).

6.2.4 Deflection

The work surface, when tested in accordance with 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 400 kPa (58 psi) when tested in accordance with ASTM C297-15. 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 10.9 of ANSI/BIFMA X5.6-2016, both before and after the cycle test specified in section 9.

6.3 Keyboard support surface

6.3.1 Dimensions

The keyboard support surface shall be as wide as specified (see 10 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, (see 10 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.

6.4 Transaction surface dimensions

The width and depth dimensions shall be specified (see 10 p).

6.5 Pedestals

The pedestals shall be work surface supporting or work surface suspended, as specified (see 10 q).

6.6 Drawers

The drawer slides shall be corrosion resistant.

6.6.1 Types

The drawers shall be either file, box or low height type, as specified (see 10 r).

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 (see 10 s). Each file drawer shall be provided with at least two removable dividers, a hanging-file rail system or one compressor, as specified (see 10 s). The drawer shall fully extend, allowing complete vertical access to usable clear space.

6.6.1.2 Box drawers

The drawer shall extend at least three quarters of its full length.

6.6.1.3 Low height drawer

The drawer shall extend at least three quarters of its full length.

6.6.2 Pencil trays

When specified (see 10 t), 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 shall 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.

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 (see 10 u). The type of door (hinged, sliding [including tambour closures], receding, folding, etc.) or the absence of doors shall be specified (see 10 u).

6.7.2 Deflection

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

6.7.3 Overhead storage units

When specified (see 10 v), 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 X5.6-2016 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 (see 10 w).

6.9 Task light fixtures

When specified (see 10 x), task light fixtures shall be provided. They shall be an articulating arm-type fixture or a fixture mounted beneath a shelf or cabinet, as specified (see 10 x). 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 (see 10 x), the intensity of the light shall be adjustable. When specified (see 10 x) the energy efficiency shall be provided.

6.10 Locks

When specified (see 10 y), combination or key-activated locks shall be supplied for doors and drawers. When specified (see 10 y), the requested number of different key-lock combinations and quantities shall be provided. Any additional lock requirements shall be specified (see 10 y). Two keys per lock will be provided. Lock mechanisms shall have adequate clearance to permit the user to operate the lock.

6.11 Modesty panels

When specified (see 10 z), 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 (see 10 z).

6.12 Tackable surfaces

When specified (see 10 aa), 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 8.5.1. The pushpin shall 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 8.5.2.

6.13 Panel-supported accessories

When specified (see 10 bb), accessories shall be provided.

7 Preparation for delivery

7.1 Unless otherwise specified (see 10 cc), 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 (see 10 dd).

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 X5.6-2016 unless other tests are specified.

8.4 Horizontal surface deflection test

Load the surface in accordance with ANSI/BIFMA X5.6-2016 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 X5.6-2016.

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 Options

The following options shall be specified in the application of this standard:

a) Type of finish (see 4.3)

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

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

d) Width and height of panel (see 6.1.1)

e) Type of trim (see 6.1.3)

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

g) Whether integral cable pathways are required (see 6.1.8)

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

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

j) Whether acoustical panels over 1525 mm (60 in.) in height shall have a NRC rating greater than 0.50 and a STC rating greater than 15 (see 6.1.10.2)

k) Width and depth of work surfaces (see 6.2.1)

l) Whether work surfaces shall have a continuous height adjustment capability, and a capability of including a height range of 575 to 747 mm (22.6 to 29.4 in.) (see 6.2.2)

m) Type of support for work surfaces (see 6.2.3)

n) The width of the keyboard support surface (see 6.3.1)

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

p) Width and depth of transaction surface (see 6.4)

q) Whether pedestals shall be work surface supporting or work surface suspended (see 6.5)

r) Type of drawer (see 6.6.1)

s) 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 (see 6.6.1.1)

t) Whether a pencil tray is required (see 6.6.2)

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

v) Whether the overhead storage units shall accommodate task lighting (see 6.7.3)

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

x) Whether a task light fixture is required, and if so, the type of fixture, articulating arm or mounted beneath a shelf or cabinet, whether it shall be capable of adjusting the intensity of the light and the minimum light efficiency desired (see 6.9)

y) 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 (see 6.10)

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

aa) Whether tackable surfaces are required (see 6.12)

bb) Whether panel-supported accessories are required (see 6.13)

cc) Preparation for delivery, if other than normal commercial practice (see 7.1)

dd) Sampling plan, if other than as specified (see 8.1).