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QUEEN'S UNIVERSITY FURNITURE SAFETY & PERFORMANCE STANDARDS General Information

Queen's University has developed detailed technical furniture specifications to ensure the general safety and performance for office and institutional furnishings. These specifications all cover flammability, surface material durability, electrical component requirements, ergonomics, materials emissions, product recyclability, etc.

The university's Furniture standards meet or exceed the ANSI/BIFMA (American National Standards Institute / Business + Institutional Furniture Manufacturers Association) minimum industry safety and performance standards for office and institutional furnishings.

The various ANSI/BIFMA standards incorporated into the technical specifications are listed below, and all text is excerpted from the BIFMA website. There are also several guidelines included as well.

<https://www.bifma.org/page/standardsoverview>

ANSI (American National Standards Institute): ANSI oversees the creation, promulgation and use of thousands of norms and standards that directly impact businesses in nearly every sector. ANSI is also actively engaged in accreditation - assessing the competence of organizations determining conformance to standards.

BIFMA (Business and Institutional Furniture Manufacturer's Association); BIFMA is the commercial furniture industry's trade association that develops and promulgates minimum industry safety and performance standards for office and institutional furnishings. BIFMA is an ANSI-accredited standards developer and many BIFMA standards are developed and approved through the ANSI process and bear the "ANSI/BIFMA" designation as part of the title of most standards.

BIFMA PC-2018 BIFMA Product Conformance Requirements

The purpose of BIFMA PC-2018 is to provide minimum requirements for claiming product conformance to BIFMA standards. Companies making product claims of conformance for BIFMA standards shall follow these requirements when making conformance statements. Customers who buy products that are declared by the manufacturer to be BIFMA compliant should be confident that any individual product they purchase would pass the appropriate BIFMA tests.

This requirements document applies to all products declared as being in conformance with ANSI/BIFMA mechanical performance standards and the BIFMA G1 Ergonomics Guideline.

BIFMA PC-2018 Document:

https://cdn.ymaws.com/bifma.site-ym.com/resource/resmgr/standards/bifma_pc-2018.pdf

ANSI/BIFMA X5.1-2017 Office Chairs

This standard is intended to provide manufacturers, specifiers, and users with a common basis for

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evaluating the safety, durability, and structural adequacy of general-purpose office chairs. General-purpose office chairs are normally used in an office environment and may include, but are not limited to those seating styles typically referred to as: executive/management, task/secretarial, side/guest chairs, nesting folding chairs, tablet arm chairs and stools.

This standard describes the means of evaluating general-purpose office chairs, independent of construction materials, manufacturing processes, mechanical designs or aesthetic designs. This standard does not address lounge seating, flammability, surface material durability, cushioning materials, product emissions, or ergonomic considerations.

The standard defines specific tests, the laboratory equipment that may be used, the conditions of tests, and the minimum acceptance levels to be used in evaluating general-purpose office chairs. The acceptance levels and test parameters given in this standard are based on the actual field use and test experience of BIFMA members. Where appropriate, the National Health and Nutrition Examination Survey (NHANES) 2007-2010 study, which indicates the weight of the 95th percentile male is 125 kg (275 pounds), was used in the development of the tests. This does not mean that users with weights above the percentiles referenced cannot safely or comfortably use a chair developed to a given BIFMA standard. (See also Appendix E). The tests were developed with an estimated product life of ten years based on single-shift usage. Product life will be affected by user size/weight, product use, care and maintenance, environment, and other factors, and, as such, product compliance to this standard does not necessarily guarantee a ten-year product life.

The tests in this standard are intended to assess the performance of new products only. They are not intended to assess a product that has been in use.

ISO 17025 requirements for measurement uncertainty do not apply to this standard.

ANSI/BIFMA X5.4-2012 Lounge Seating

This standard is intended to provide manufacturers, specifiers, and users with a common basis for evaluating the safety, durability, and structural adequacy of business and institutional lounge and public seating.

Lounge and public seating is normally used in indoor public spaces such as waiting, reception, or gathering areas. Lounge and public seating includes products with single seat units, units with multiple seating positions within one unit or ganged seating units. Lounge and public seating may be restrained from moving by attaching to the building structure or freestanding. These products are not generally adjustable for personal use. This standard does not address general-purpose or task-oriented office chairs, or seating used for stadiums, auditoriums, lecture rooms, airports/train stations and similar high-use public seating areas.

ANSI/BIFMA X5.5-2014 Desk Products

This standard provides a common basis for evaluating the safety, durability and structural performance of desk/table products intended for use in commercial office and related institutional environments

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such as educational environments. It provides test methods and performance requirements for desk/table products. Where a product may be covered by more than one ANSI/BIFMA standard, the manufacturer shall determine which standard provides the most appropriate test conditions. Where a product is intended for use outside of the commercial office and related institutional environments, it is the responsibility of the user of this standard to determine if it is suitable for use in such evaluations.

Note: Commercial product naming conventions may cause confusion regarding the applicability of this and other BIFMA standards. For example, a "credenza" is typically defined and tested in the BIFMA X5.5 Desk standard, however, some configurations of "credenzas" will appear to be storage products within the definition of this standard and may be appropriately tested by X5.9 Storage Units - Tests standard. The manufacturer shall determine which standard provides the most appropriate test conditions.

ANSI/BIFMA X5.6-2016 Panel Systems

This standard is intended to provide a common basis for evaluating the safety, durability, and structural performance of panel systems products, such as panels, screens, panel-supported systems, access doors and various hang-on components used in conjunction with panel systems products. Building wall-mounted components are not covered by this standard; they are covered by the ANSI/BIFMA X5.9 Standard for Office Furniture Storage Units' Tests. Where a product may be covered by more than one ANSI/BIFMA standard, the manufacturer shall determine which standard provides most appropriate test conditions. Where a product is intended for use outside of the commercial office and related institutional environments, it is the responsibility of the user of this standard to determine if it is suitable for use in such evaluations.

This standard specifies acceptance levels to help ensure reasonable safety and performance independent of construction materials, manufacturing processes, mechanical designs, or aesthetic designs. The acceptance levels herein are based on the actual field and test experience of BIFMA members.

This standard also provides recommendations for acoustical performance of panel systems products, and an Informative Annex that addresses considerations for Full-height Relocatable Wall products. The standard defines tests used to determine the acceptability of the product and specifies the acceptance levels of performance. These tests are not intended to assess a product that has been in use.

The tests were developed with an estimated product life of ten years based on a single-shift usage. Product life will be affected by product use, care and maintenance, environment, and other factors. Product compliance to this standard does not necessarily guarantee a ten-year product life. Products may perform longer than ten years with appropriate use and care.

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

ANSI/BIFMA X5.9-2019 Storage Units

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BIFMA X5.9-2019 is intended to provide a common basis for evaluating the safety, durability and structural performance of storage units. It provides test methods and performance requirements for freestanding, mobile, and wall-mounted storage units. Where a product may be covered by more than one ANSI/BIFMA standard, the manufacturer shall determine which standard provides most appropriate test conditions. This standard applies to products designed for use in commercial and institutional environments. Its application for other environments may not be appropriate; it is the responsibility of the user of this standard to determine its applicability to such environments. Note: Commercial product naming conventions may cause confusion regarding the applicability of this and other BIFMA standards. For example, a "credenza" is typically defined and tested in the BIFMA X5.5 Desk standard, however, some configurations of "credenzas" will appear to be storage products within the definition of this standard and may be appropriately tested by this standard. The manufacturer shall determine which standard provides most appropriate test conditions.

This standard specifies test methods and acceptance levels to help ensure reasonable safety and performance independent of construction materials, manufacturing processes, mechanical designs, or aesthetic designs. These tests are not intended to assess a product that has been in use.

The tests were developed with an estimated product life of ten years based on a single-shift usage. Product life will be affected by product use, care and maintenance, environment, and other factors: product compliance to this standard does not necessarily guarantee a ten-year product life. Products may perform longer than ten years with appropriate use and care. The acceptance levels herein are based on the actual field and test experience of BIFMA members.

ISO 17025 requirements for measurement uncertainty do not apply to this standard.

ANSI/BIFMA X5.11-2015 Large Occupant Office Chair

This standard is intended to provide manufacturers, specifiers, and users with a common basis for evaluating the safety, durability, and structural adequacy of office chairs for large occupants (often referred to as "users" throughout this standard).

ANSI/BIFMA X6.1-2018 Educational Seating

BIFMA X6.1-2018 is intended to provide manufacturers, specifiers, and users with a common basis for evaluating the safety, durability, and structural adequacy of Educational Seating, including units with integrated desk or table surfaces. The tests in this standard are intended to evaluate seating for students in pre-school, elementary, middle school, high school, adult education, trade school, and college environments. These tests are not intended to evaluate products used in living/dorm environments. The educational seating products covered by this standard are normally used in schools and colleges and include those typically referred to as chairs, stacking chairs, tablet-arm chairs, chair-desks, stools, and convertible bench/tables. Seating products that are anchored to the building floor or structure and bleachers are not specifically addressed in this standard.

Chairs with tilting seats and/or backs such as executive/management chairs, task/secretarial/teacher chairs, side/guest chairs may be used in educational environments, but these products are covered by

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ANSI/BIFMA X5.1 General-Purpose Office Chairs - Tests (designated within that standard as Type I and II). Similarly, items such as lounge seating may also be used in the educational environment; however, these are covered by ANSI/BIFMA X5.4 Lounge Seating - Tests. Mobile cafeteria tables with attached seating are covered by UL 2040 "Folding Rollaway Tables". Where a product may be covered by more than one ANSI/BIFMA standard, the manufacturer shall determine which standard provides most appropriate test conditions. Where a product is intended for use outside of the educational and related institutional environments, it is the responsibility of the user of this standard to determine if it is suitable for use in such evaluations.

Tests in this standard were developed considering the weight ranges based on age (not grade level) for the size categories. These weights were taken from CAESAR and/or NHANES as appropriate. Where appropriate, the National Health and Nutrition Examination Survey (NHANES) 2011-2014 study was used in the development of the tests (see Table 2). This standard also considered the occasional use of the smaller (Category A and B) products by adults. The tests were developed with an estimated product life of ten years based on estimates for usage as determined by the manufacturers' experience and research.

In general, seating was estimated to be used 6.5 to 8 hours/day and 170-180 days per year for learning environments and other common space environments and 2 to 4 hours/day for convertible bench tables. Product life will be affected by user size/weight, daily hours of use, product use, care and maintenance, environment, and other factors, and, as such, product compliance to this standard does not necessarily guarantee a ten-year product life. Actual life of the product may be more or less than ten years depending on the aforementioned factors.

This standard describes the means of evaluating Educational Seating, independent of construction materials, manufacturing processes, mechanical designs or aesthetic designs. This standard does not address flammability, surface material durability, cushioning materials, product emissions, lead content, or ergonomic considerations; these properties may be covered by other standards/regulatory documents.

The standard defines specific tests, the laboratory equipment that may be used, the conditions of tests, and the minimum acceptance levels to be used in evaluating educational seating. The acceptance levels given in this standard are based on the actual field use and test experience of BIFMA International members. The tests in this standard are intended to assess the performance of new products only. They are not intended to assess a product that has been in use.

ISO 17025 requirements for measurement uncertainty do not apply to this standard.

BIFMA X6.4-2018 Occasional-Use Seating

BIFMA X6.4-2018 defines specific tests, laboratory equipment, conditions of test, and recommended minimum levels to be used in the test and evaluation of the performance, durability, and structural adequacy of occasional-use seating units.

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This standard is intended to provide manufacturers, specifiers, and users with a common basis for evaluating the safety, durability, and structural adequacy of occasional-use seating.

Occasional-use seating is normally used in indoor spaces such as waiting, reception, or gathering areas. Occasional-use seating includes products with single seat units, units with multiple seating positions within one unit or ganged seating units. Occasional-use seating is freestanding. Occasional-use seating products are generally not adjustable for personal use.

This standard does not address general-purpose or task-oriented office chairs, or seating used for stadiums, auditoriums, lecture rooms, airports/train stations and similar high-use public seating areas.

These types of products may be covered by other BIFMA standards. It is the responsibility of the user of this standard to determine if it is suitable for the intended use as defined in the scope of this document.

This standard specifies tests and acceptance levels to help ensure reasonable safety and performance independent of construction materials, manufacturing processes, mechanical designs, or aesthetic designs. This standard does not address flammability, surface material durability, cushioning materials, product emissions, or ergonomic considerations.

The acceptance levels herein are based on the actual field and test experience of BIFMA members. Where appropriate, the National Health and Nutrition Examination Survey (NHANES) 2007-2010 study, which indicates the 95th percentile male weighs 125 kg (275 pounds), was used in the development of the tests. The tests were developed with an estimated product life of five years based on continuous single-shift usage. Product life will be affected by user size/weight, product use, care and maintenance, environment, and other factors, and, as such, product compliance to this standard does not necessarily guarantee a five-year product life. Products may perform longer than 5 years with appropriate use and care. This standard may not apply to seating for persons in medically compromised conditions that are often found in certain health care environments, such as physical therapy and weight loss clinics. These environments may require specific product designs that may not be adequately covered by the requirements of this standard.

ANSI/BIFMA M7.1-2011(R2016) Standard Test Method for Determining VOC Emissions

The standard Test Method is intended for determining volatile organic compound (VOCs including aldehydes) emissions from office furniture and seating under environmental and product usage conditions that are typical of those found in office buildings.

ANSI/BIFMA X7.1-2011(R2016) Standard for Formaldehyde and TVOC Emissions

This standard is intended to provide performance requirements for the emissions of volatile organic compounds (VOCs), including Formaldehyde and Aldehydes, from Office Furniture Systems and Seating. This standard specifies acceptance levels that define low-emitting furniture independent of construction materials, manufacturing processes, mechanical designs, or aesthetic designs. This standard is intended to apply to a newly manufactured product and does not apply to products that have been in use.

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ANSI/BIFMA e3-2019 Furniture Sustainability Standard

The ANSI/BIFMA e3 Furniture Sustainability Standard was developed by a "Joint Committee" of stakeholders using a consensus process described by the American National Standards Institute.

The purpose of this voluntary standard is to provide measurable market-based definitions of progressively more sustainable furniture by establishing performance criteria that address environmental and social aspects throughout the supply chain. It addresses product-based characteristics in the general areas of materials, energy usage, human and ecosystem health, and social responsibility impacts. The standard was designed to allow for multiple levels of achievement and to provide an open alternative to proprietary protocols.

BIFMA e-3 furniture standard now requires low emissions criteria for BIFMA level certification.

Recently, the Business and Institutional Furniture Manufacturers Association (BIFMA) announced updates to its ANSI/BIFMA e3-2019 Furniture Sustainability Standard. The updated standard requires some additional measures to meet new prerequisite criteria and report with increased transparency. A key update that will affect furniture manufacturers is that the Low Emitting Furniture credit (credit 7.6.1) is now a prerequisite, requiring that all level certified furniture products meet the ANSI/BIFMA x7.1 Standard for Emissions.

BIFMA G1-2013 Ergonomics Guideline

The purpose of this Guideline is to provide guidance to designers and specifiers in developing, designing and specifying ergonomic solutions for computer workspaces in North America. The relevant measurable ergonomic principles and design requirements are found in ISO 9241-303 and 9241-5. The dimensions and adjustment ranges of components are based on the anthropometric data provided in CAESAR (June 2002), weighted to the United States population demographics from the National Health and Nutrition Examination Survey (NHANES) 2007-2008 and 2009-2010 datasets. Other tasks may require considerations not addressed in this Guideline.

Proper application of ISO's principles will enhance the performance and comfort of computer users. The more intensive the computer usage, the more important adherence to these principles becomes. This Guideline is intended for use by:

- BIFMA Members and other Furniture Manufacturers
- Interior Designers/Architects/Specifiers/Industrial Designers
- Facility and Purchasing Managers
- Ergonomists, Industrial Hygienists, Occupational Therapists, Health Care Providers
- Testing Laboratories
- Furniture Dealers and their clients
- Other professionals involved in the design, manufacturing, specifying, qualifying and purchasing of office furniture for computer work spaces

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Note: G1 is a Guideline not a Standard; the dimensions given within the G1 document are recommendations not requirements. The committee intends this document to be primarily used to give design guidance to manufacturers of furniture to be used in office workspaces. It is expected that specifiers/customers will want to use this document to determine their purchasing specifications. It should be noted that this document does not make specific recommendations for some product dimensions. This is due to the complexities inherent in some of these areas; they are presented in the G1's discussion sections. In some cases, a manufacturer will provide information pertaining to the percentile of the user population their product(s) will accommodate.

BIFMA HCF 8.1-2017 Health Care Furniture Design Guidelines for Cleanability

The purpose of BIFMA HCF 8.1-2017 is to provide guidance to furniture manufacturers and healthcare professionals in understanding typical cleaners, disinfectants, cleaning methods, and performance of furniture when exposed to these cleaners and disinfectants. It is the intent of this guideline to bring the recommended manufacturers' standards in line with existing practices and typically used cleaners. This guideline offers standard test methodologies and specific performance recommendations to which manufacturers can test; and to which users may evaluate relative product performance. This guideline also provides product design considerations that support effective cleanability of healthcare furniture products.