BIFMA

BUSINESS + INSTITUTIONAL FURNITURE MANUFACTURERS ASSOCIATION

OVERVIEW OF EDUCATIONAL FURNITURE STANDARDS

DECEMBER 1, 2016

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BIFMA

BUSINESS + INSTITUTIONAL FURNITURE MANUFACTURERS ASSOCIATION

Agenda

OVERVIEW OF BIFMA

ANSI PROCESS

ANSI/BIFMA STANDARDS

UPHOLSTERED FURNITURE FLAMMABILITY

INTERNATIONAL STANDARDS

QUESTIONS?

BIFMA

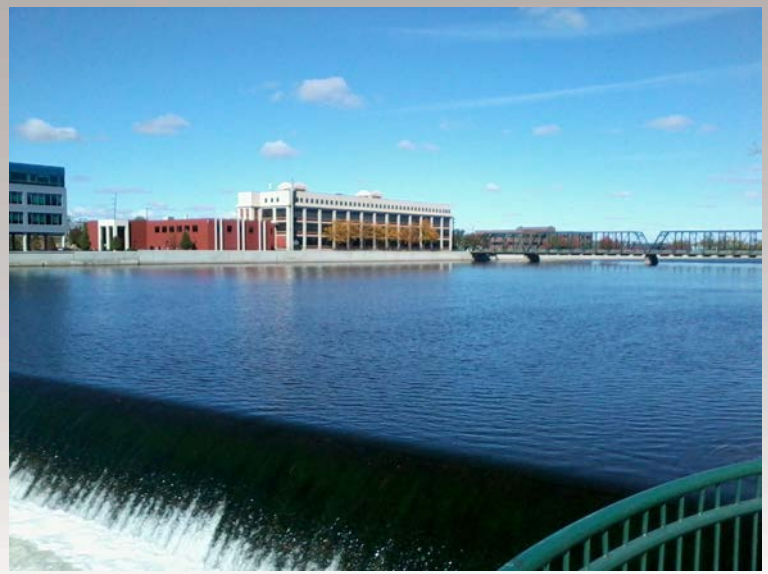
Founded in 1973

Over 300 members are producers, suppliers, and other service providers of office and institutional furniture

Develops voluntary product and industry standards

Advocates on behalf of the industry with legislators and regulators

Publishes key industry statistics



ANSI Process

Consensus
Openness
Balance
Due Process

BIFMA is an ANSI-accredited Standards Developer

The Most Widely Used BIFMA Standards

ANSI/BIFMA X5.1, X5.4, X5.11 and X6.1 *Seating*

ANSI/BIFMA X5.9 *Files and Storage Units*

ANSI/BIFMA X5.5 *Desk / Table Products*

ANSI/BIFMA X5.6 *Panel Systems*

ANSI/BIFMA M7.1 and X7.1 *Emissions*

ANSI/BIFMA e3 *Furniture Sustainability*

BIFMA G1 *Ergonomics Guideline*

ANSI/BIFMA X5.1 General-Purpose

"… 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, stacking chairs, tablet arm chairs and stools."

In reality, this standard is used for many other types of chairs in addition to those listed above. This is the workhorse of North American seating tests.

The 95th percentile male weighs 253 pounds and was used as the basis for the tests along with a 10-year life at single shift usage.

> Note: This standard is currently undergoing revision proposals. Likely the next revision will use 275 pounds as the basis.

ANSI/BIFMA X5.4 Lounge / Public

"… normally used in indoor public spaces such as waiting, reception, or gathering areas. Lounge and public seating products are generally not adjustable for personal use."

Where a product may be covered by more than one ANSI/ BIFMA standard, the manufacturer shall determine which standard provides most appropriate test conditions.

The 95th percentile male weighs 253 pounds and was used as the basis for the tests along with a 10-year life at single shift usage.

Note: This standard is now undergoing revision proposals.

ANSI/BIFMA X5.11 Large Occupant

Similar scope to ANSI/BIFMA X5.1 General-Purpose, except the basis uses a 400 pound male.

The seat width must be 22 inches or greater.

The tests were developed in conjunction with Mississippi State University.

ANSI/BIFMA X6.1 Educational Seating

Pre-school, elementary, middle school, high school, adult education, trade school, and college.

These tests are not intended to evaluate products used in living/ dorm environments.

Includes units with integrated desk or table surfaces.

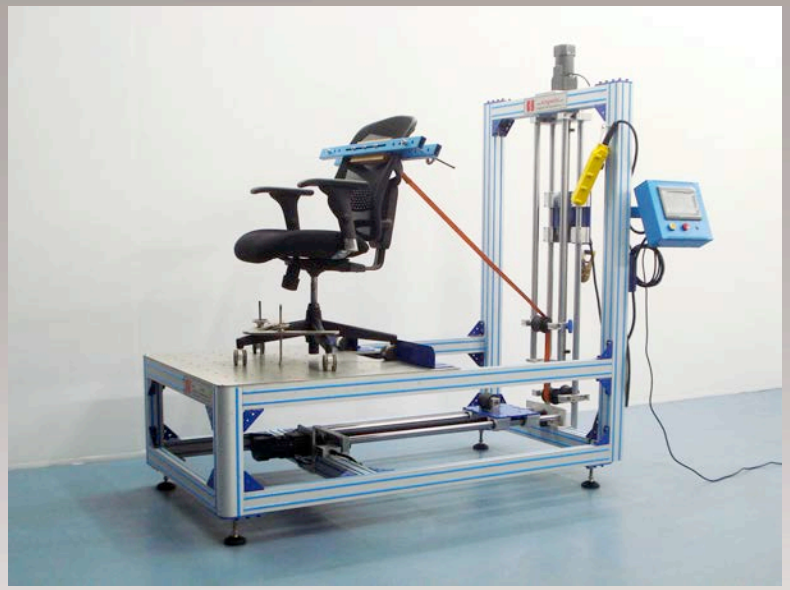
Size A: Seat Height < 13.9 inches / User Weight 75 lbs. (age 6)

Size B: Seat Height 13.9-16.7 inches / User Weight 165 lbs. (12)

Size C: Seat Height > 16.7 inches / User Weight 253 lbs. (adult)

Backrest Strength

The chair must withstand a force for one minute for the functional requirement and a greater force for the proof requirement.



Drop Test

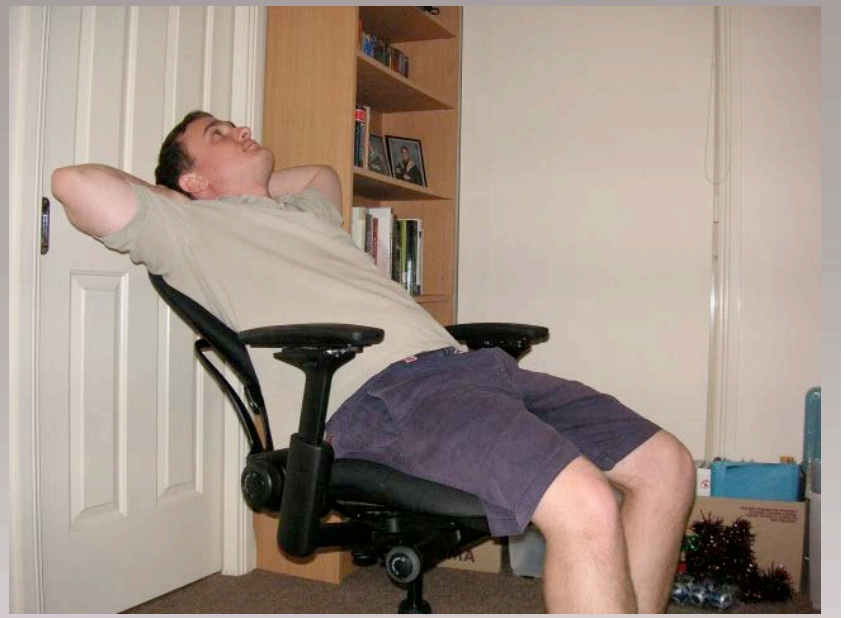
The chair must withstand a weighted bag dropped into the chair for the functional requirement and a heavier bag for the proof requirement.

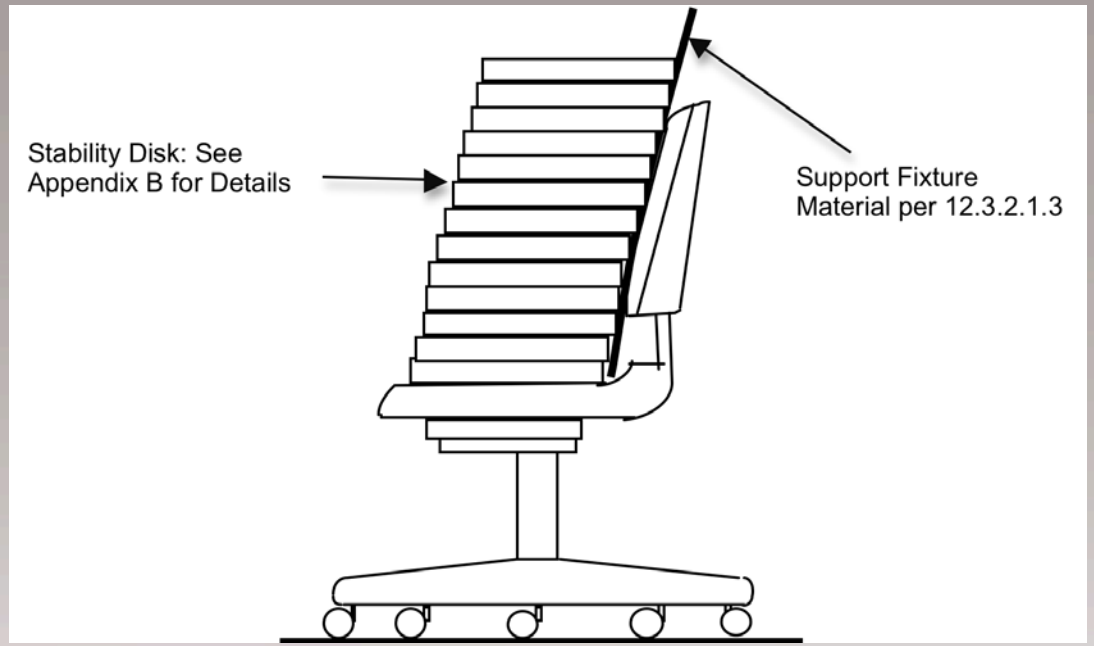
Seating Durability

The chair must withstand a weighted bag set into the center of the seat pan for 100,000 cycles; and again for 20,000 cycles each front corner.

Rear Stability

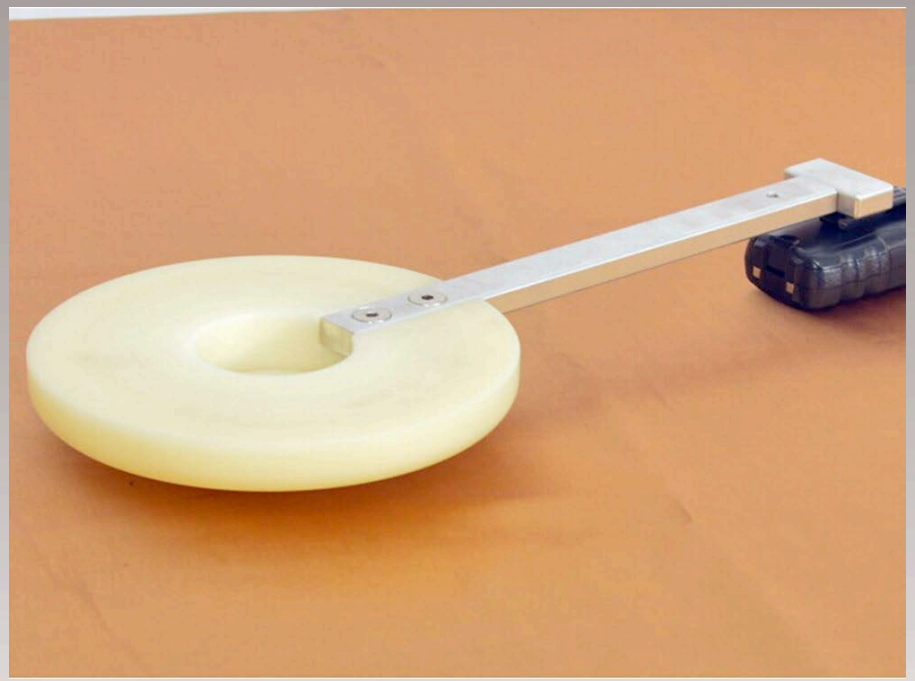
Numerous disks representing a person leaning back are placed along the backrest. The chair must not tip over.

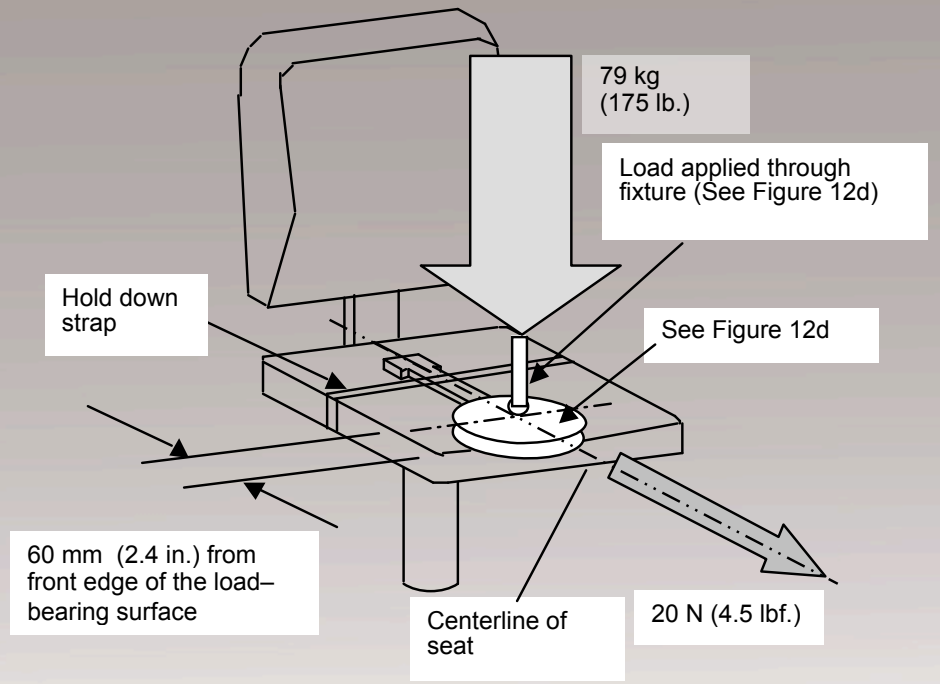




Front Stability

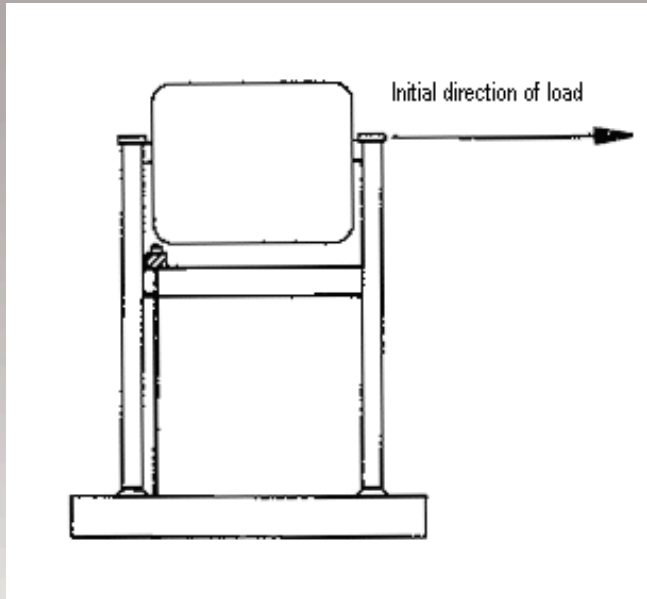
Test loads representing a person sitting on the front edge are applied very near the front of the seat pan. The chair must not tip over.





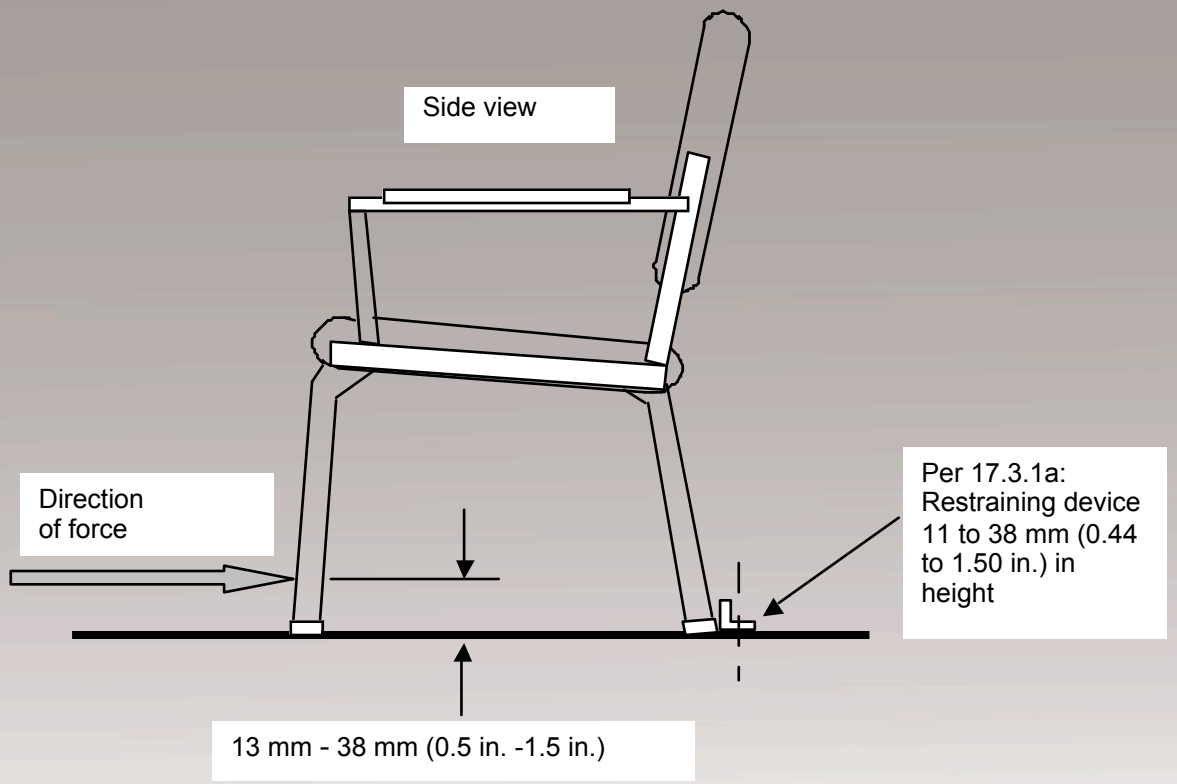
Arm Strength Tests

The chair must withstand a force for one minute in the vertical direction for the functional requirement and a greater force for the proof requirement.
The chair must withstand a force for one minute in the horizontal direction for the functional requirement and a greater force for the proof requirement.



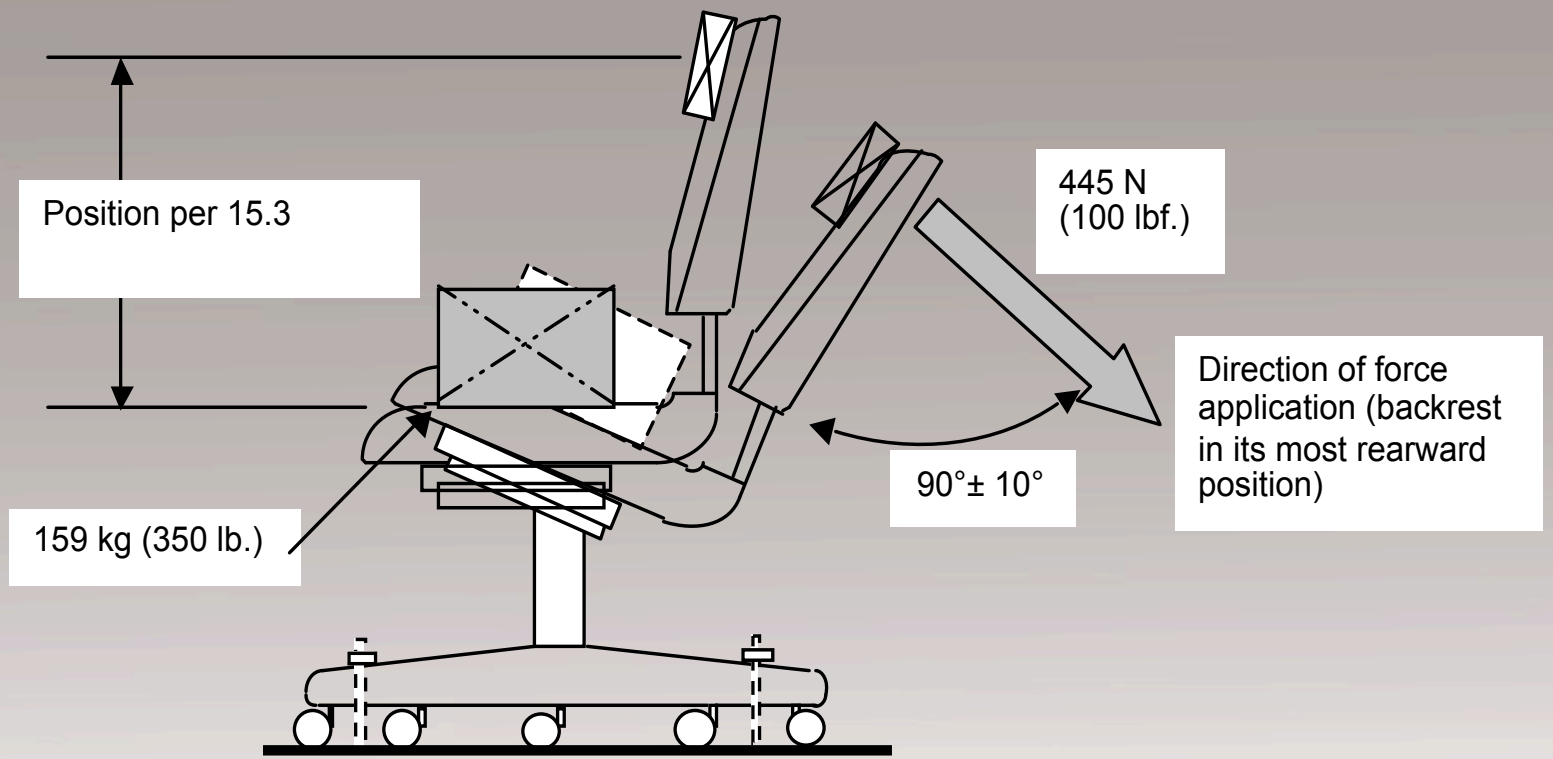
Leg Strength Tests

The chair must withstand a force for one minute in the horizontal direction at the front leg the functional requirement and a greater force for the proof requirement. Repeat for a side application.



Backrest Durability

The chair must withstand a force applied to the seat back for 120,000 cycles. Locations vary depending upon the size of the backrest.



Angular Armrest Durability

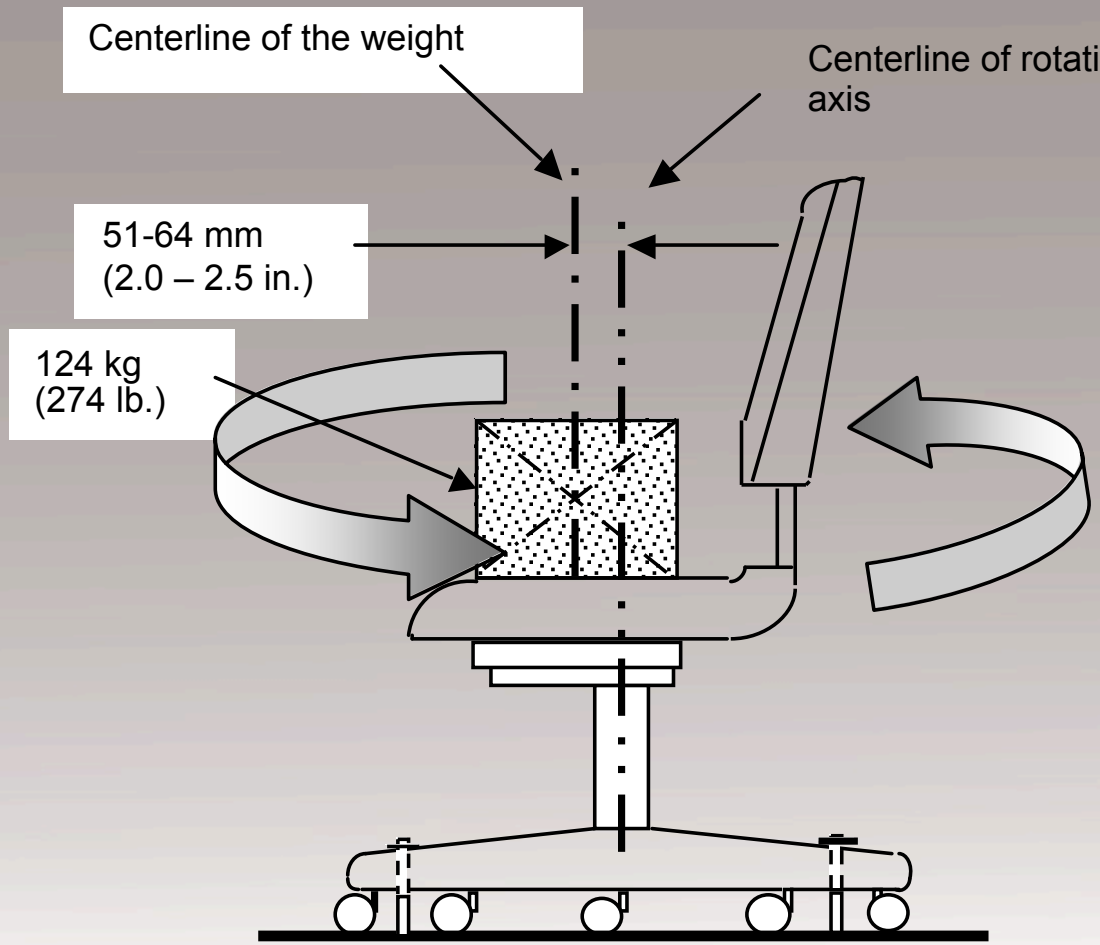
The chair must withstand forces applied to the armrests (each simultaneously) for 60,000 cycles.

Structural Durability

The chair must withstand a horizontal force applied at seat pan level for 50,000 cycles.

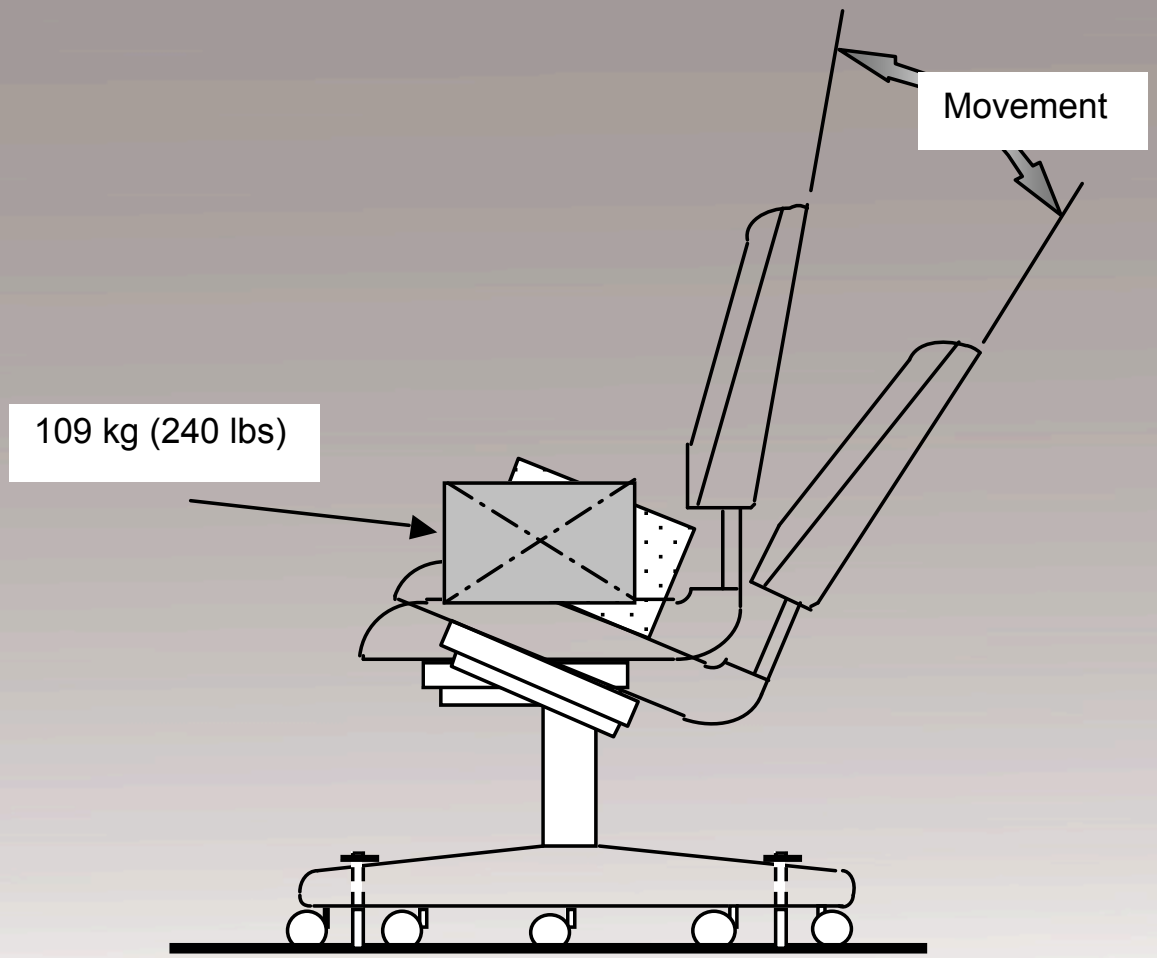
Swivel Test

The chair must withstand repeated swiveling of 360 degrees for 120,000 cycles (60,000 each at highest / lowest positions if applicable)



Tilt Mechanism

The chair must withstand the fatigue stresses and wear caused by repeated tilting of 300,000 cycles.

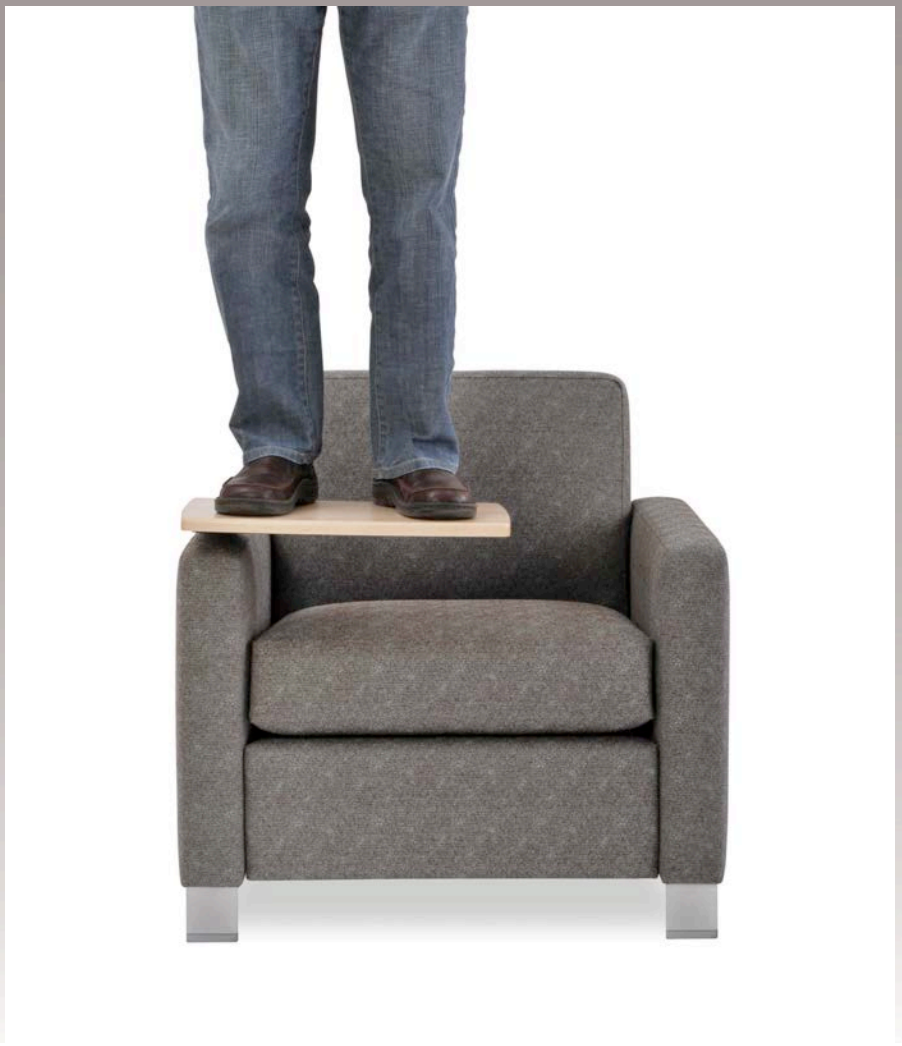


Caster Durability

The chair must withstand cycling a certain distance for 100,000 cycles including a specified number of cycles over obstacles.

Tablet Arm Tests

There are two Tablet Arm tests: one for static loading and one for repeated loading.



Footrest Tests

There are two Footrest tests: one for static loading and one for repeated loading.

ANSI/BIFMA X5.6 Panel Systems

This standard tests products such as, panels, screens, panel-supported systems, access doors and various hang-on components used in conjunction with panel systems products.

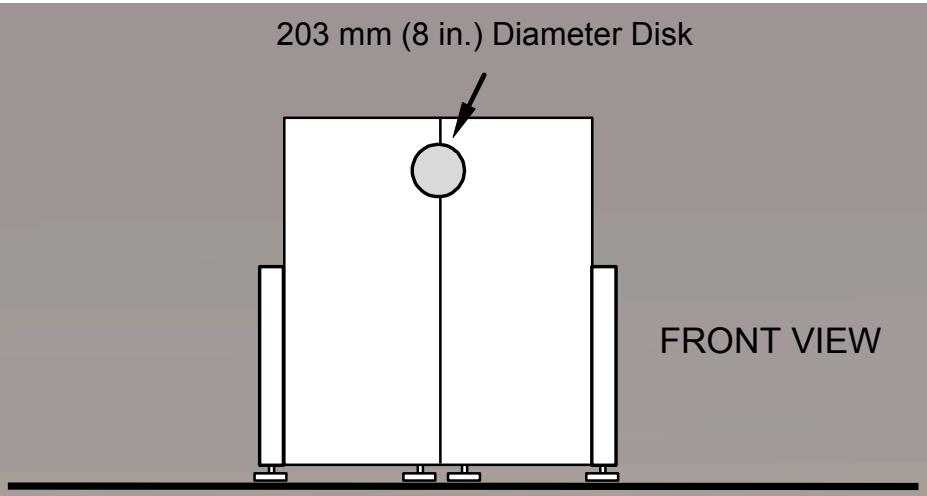
This standard also provides recommendations for acoustical performance of panel systems products, and an Informative Annex that addresses considerations for Full-height Relocatable Wall products.

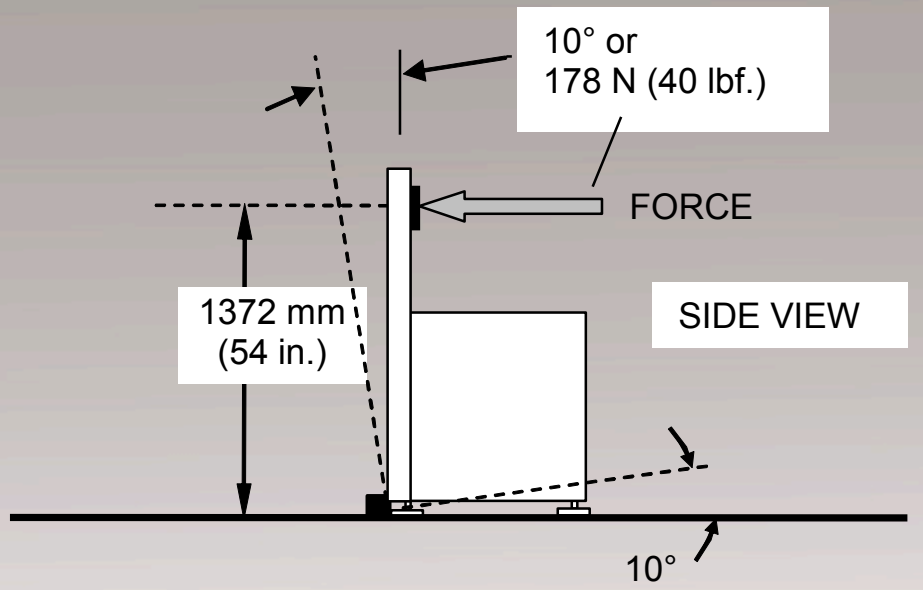
Panel Flammability

This test is not intended for panels or screens less than 1829 mm (72 in.) in height or less than 0.93 square meters (10 square feet) in area .

Panel Stability Tests

There are force and impact stability tests for Panels and Screens.





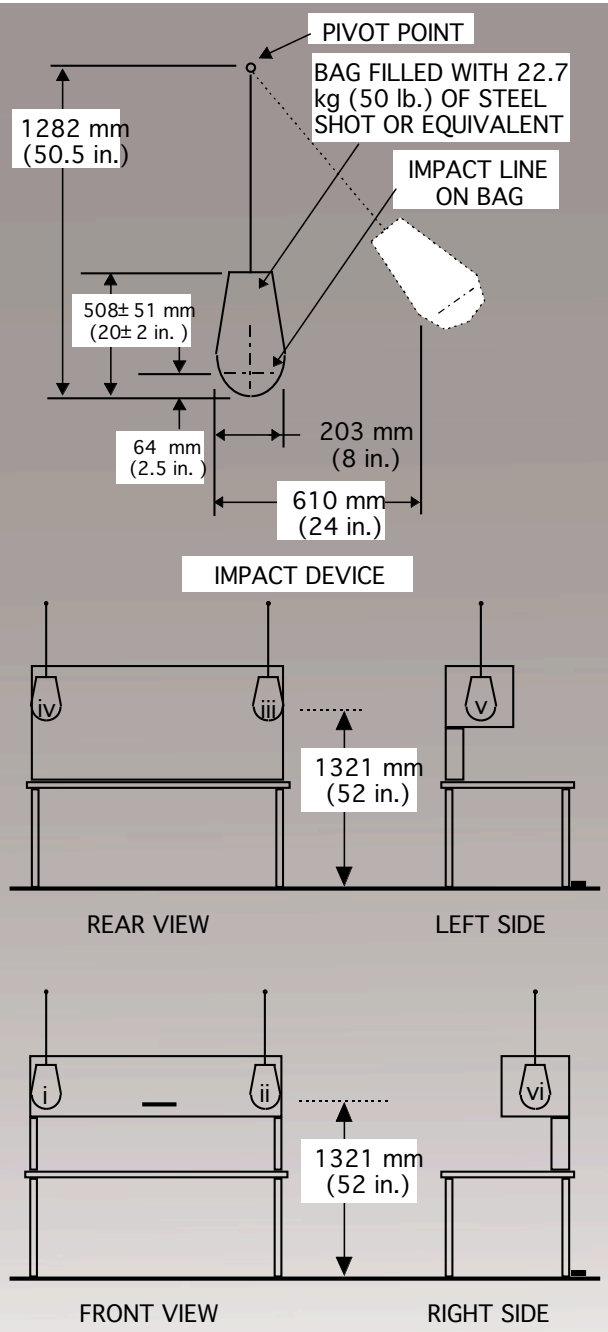
FORCE APPLICATION FROM THE FRONT

ANSI/BIFMA X5.9 Storage Units

Storage units include, but are not limited to, bookcases, wardrobes, cabinets, wall-mounted or exterior-mounted elements (such as shelf assemblies or paper management accessories), freestanding and mobile pedestals, etc.

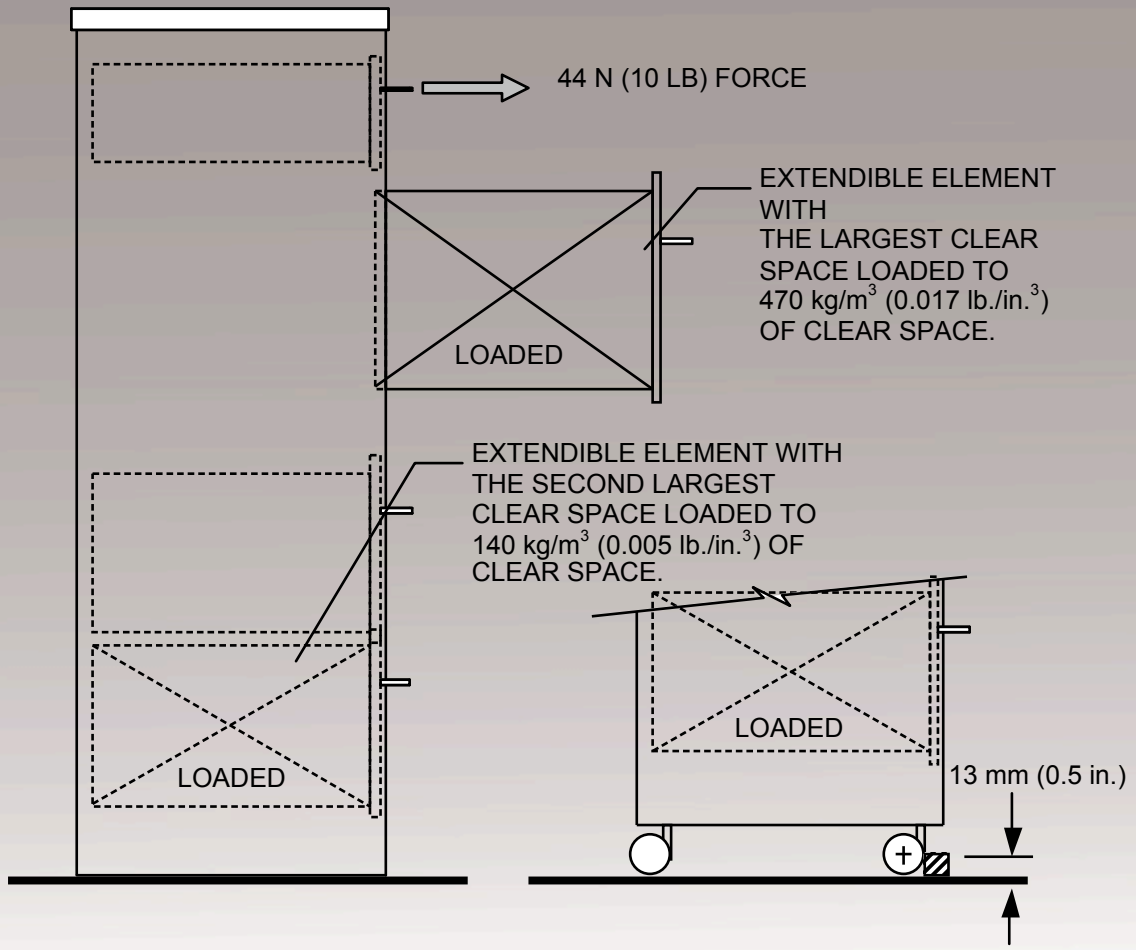
Separation Test

The purpose of this test is to evaluate the ability of tall storage products with stacked or attached components to resist separation due to horizontal impacts.



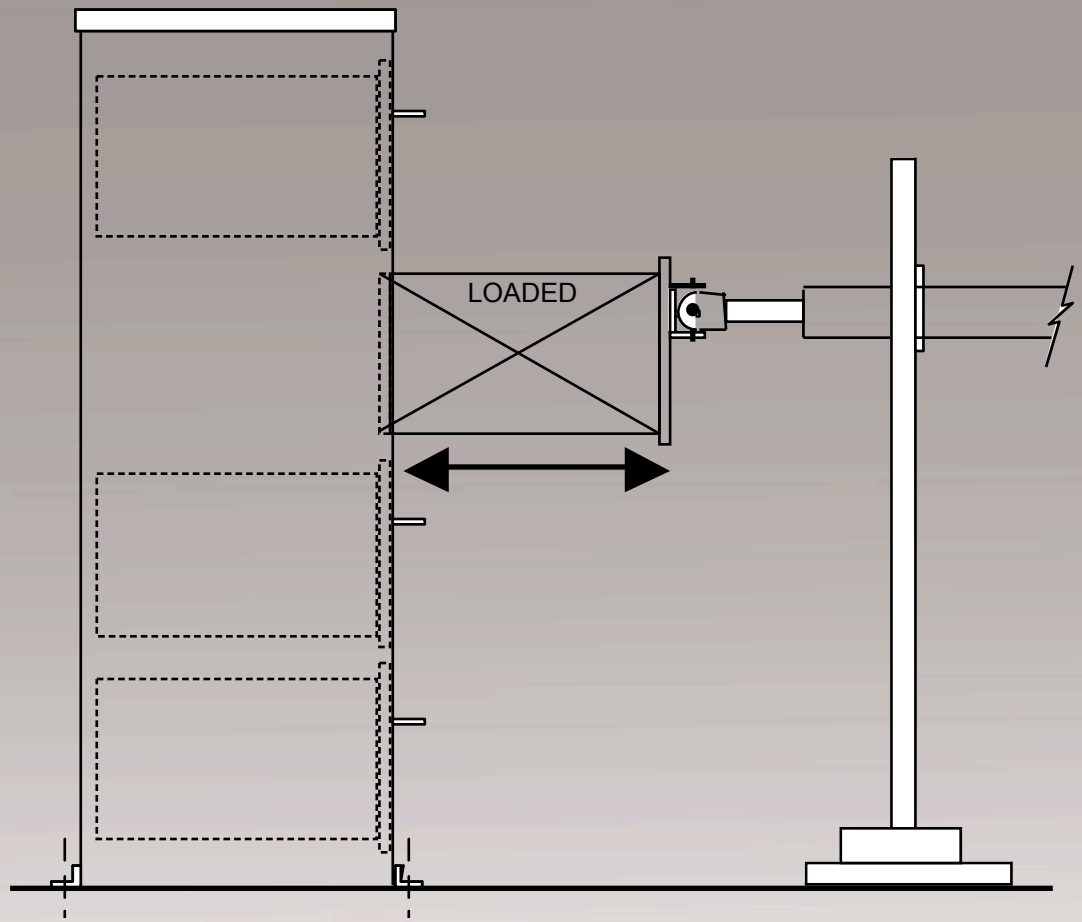
Stability

There are several types of Stability Tests for Storage Units



Cycle Tests

Open and close the drawers for 50,000 cycles.
Pull location dependent upon design.



Door Tests

Table 7 - Door Test Applicability

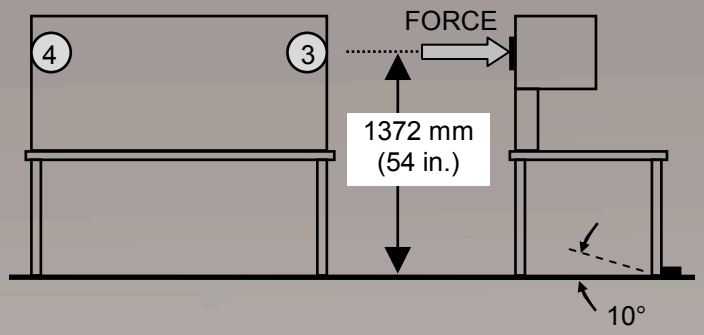
Door Type/Test	Strength Test	Cycling wear & fatigue	Slam Tests	Lock Tests	Latch Test	Pull Test
Vertically Hinged Doors and Multi-fold Doors	17.2 & 17.3	17.6	17.10	14.3 & 14.4	17.14	20
Horizontally Hinged Doors	n/a for top hinged doors. Bottom hinged doors that are subject to loading shall be tested per Section 4	17.6 & 17.9	17.11 n/a for bottom hinged doors	14.3 & 14.4	17.14	20
Vertical Receding Doors	17.2, 17.3 & 17.4	17.6,17.7 & 17.9	17.10	14.3 & 14.4	17.14	20
Horizontal Receding Doors	17.5	17.6, 17.8 & 17.9	17.11	14.3 & 14.4	17.14	20
Horizontally Sliding/ Roll Front	n/a	17.6	17.12 or 17.13 (as applicable)	14.3 & 14.4	17.14	20
Tambour	n/a	17.6	17.12 or 17.13 (as applicable)	14.3 & 14.4	17.14	20

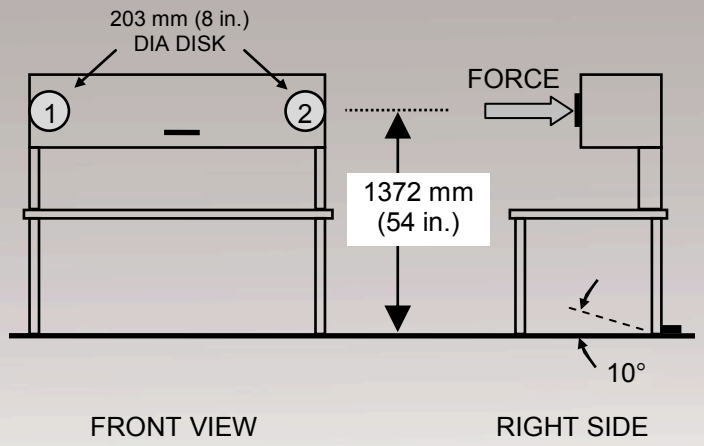
ANSI/BIFMA X5.5 Desk / Table Products

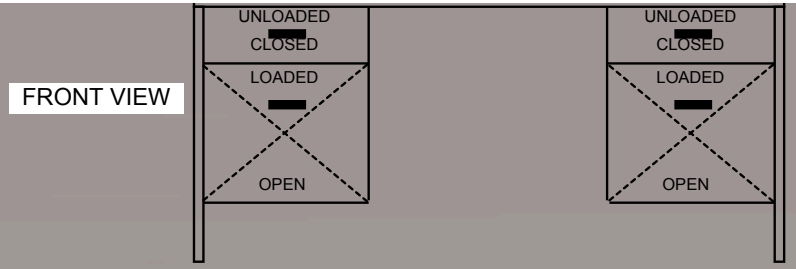
Covers products such as Desks, Credenzas, Tables, and Benching.

Benching Systems is new to the 2014 edition. Benching is a series of primary surfaces interconnected longitudinally to a length greater than 72 in. by an integrated/shared support structure to extend the span of the overall surface.

Stability Tests







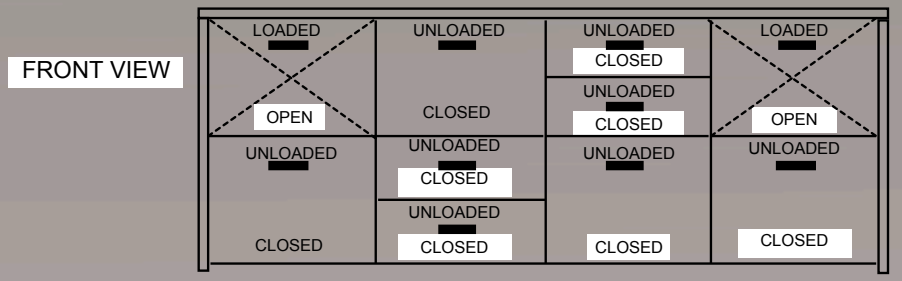


Figure 4a - Stability with Extendible Elements Open Test

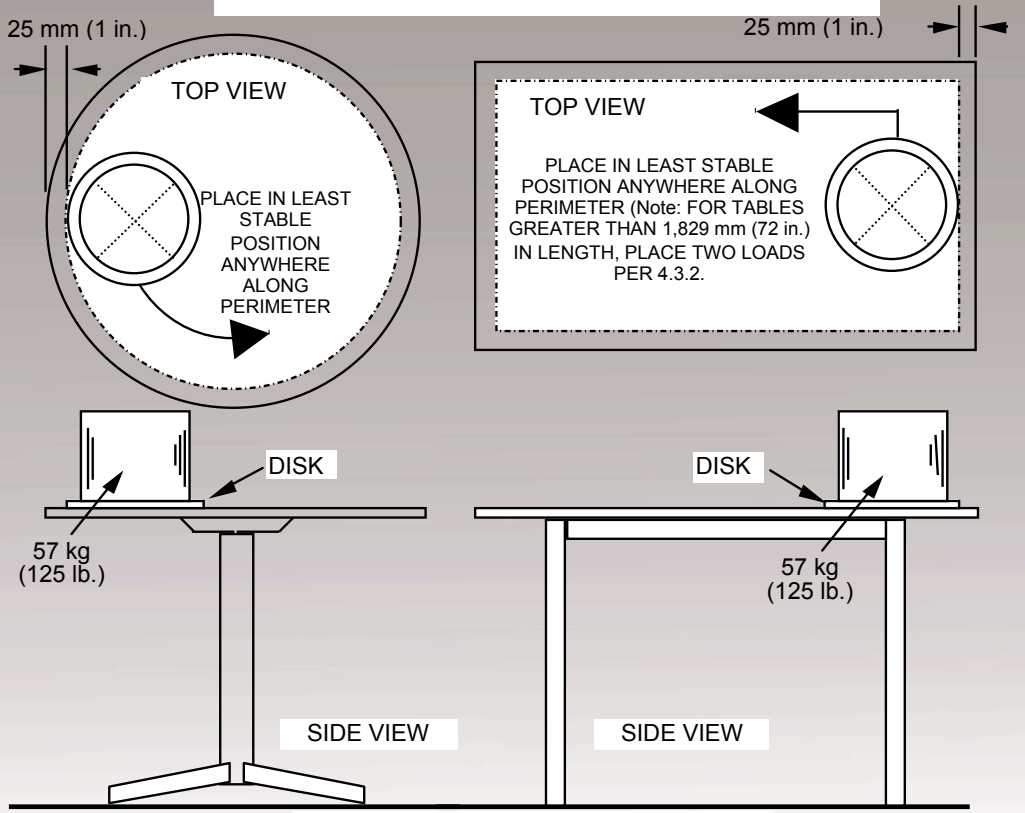


Figure 4b - Stability Under Vertical Load

Unit Strength Tests

The purpose of these tests is to evaluate the ability of the unit to withstand static loads when loaded to its full capacity.

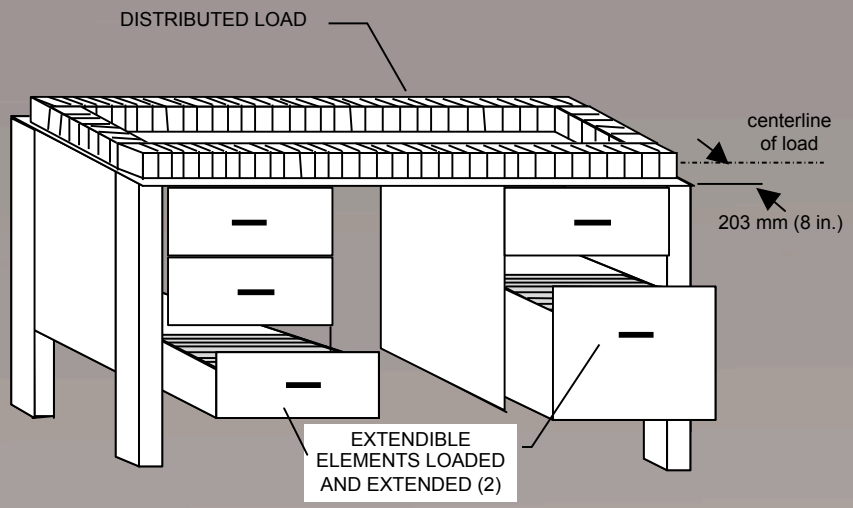


Figure 5e - Distributed Load Tests for Primary Surfaces

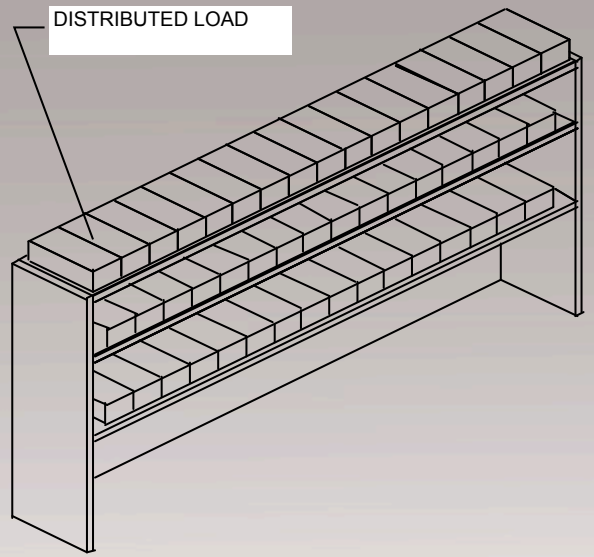
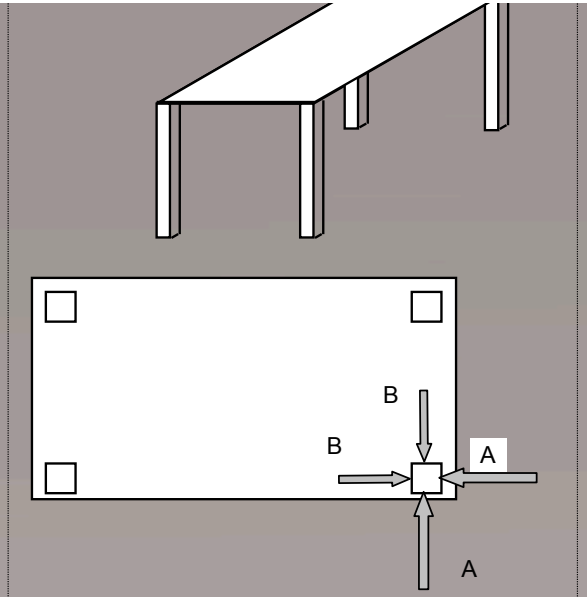


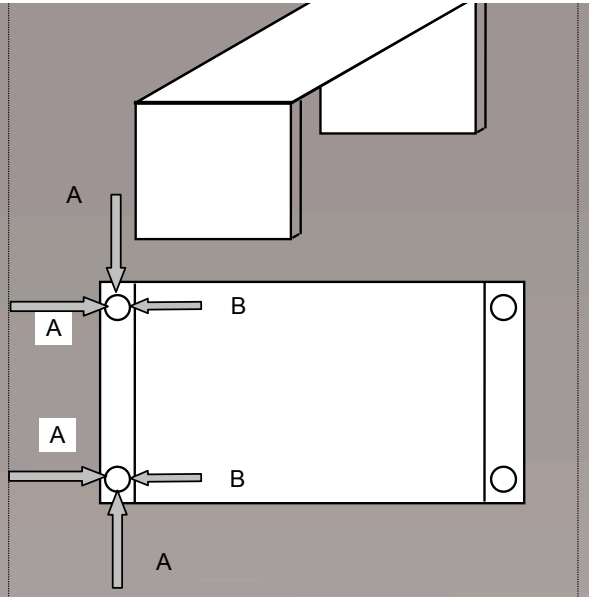
Figure 5f - Distributed Load Tests for Secondary Surfaces

Leg Strength Tests

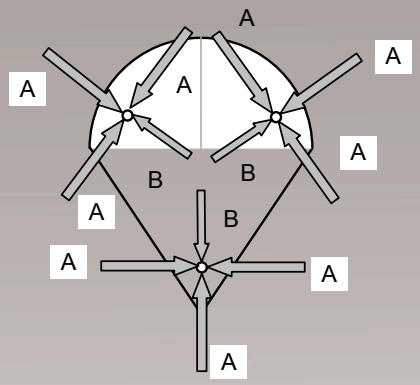
The purpose of these tests is to evaluate the ability of desk/table product to withstand handling or moving.



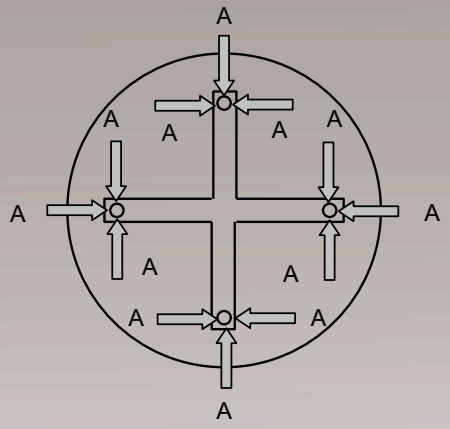
GLIDES “NOT CONNECTED”



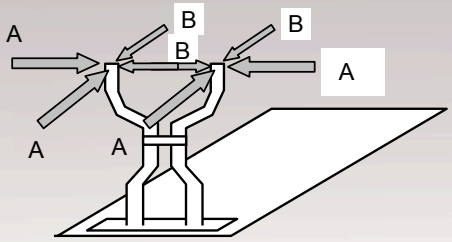
GLIDES “CONNECTED”



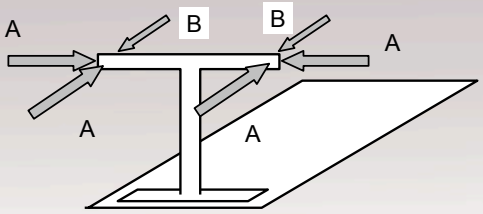
TABLES WITH LEGS TESTED
AS IF GLIDES ARE “NOT CONNECTED”



CROSS SLAB LEGS TESTED AS SHOWN ABOVE



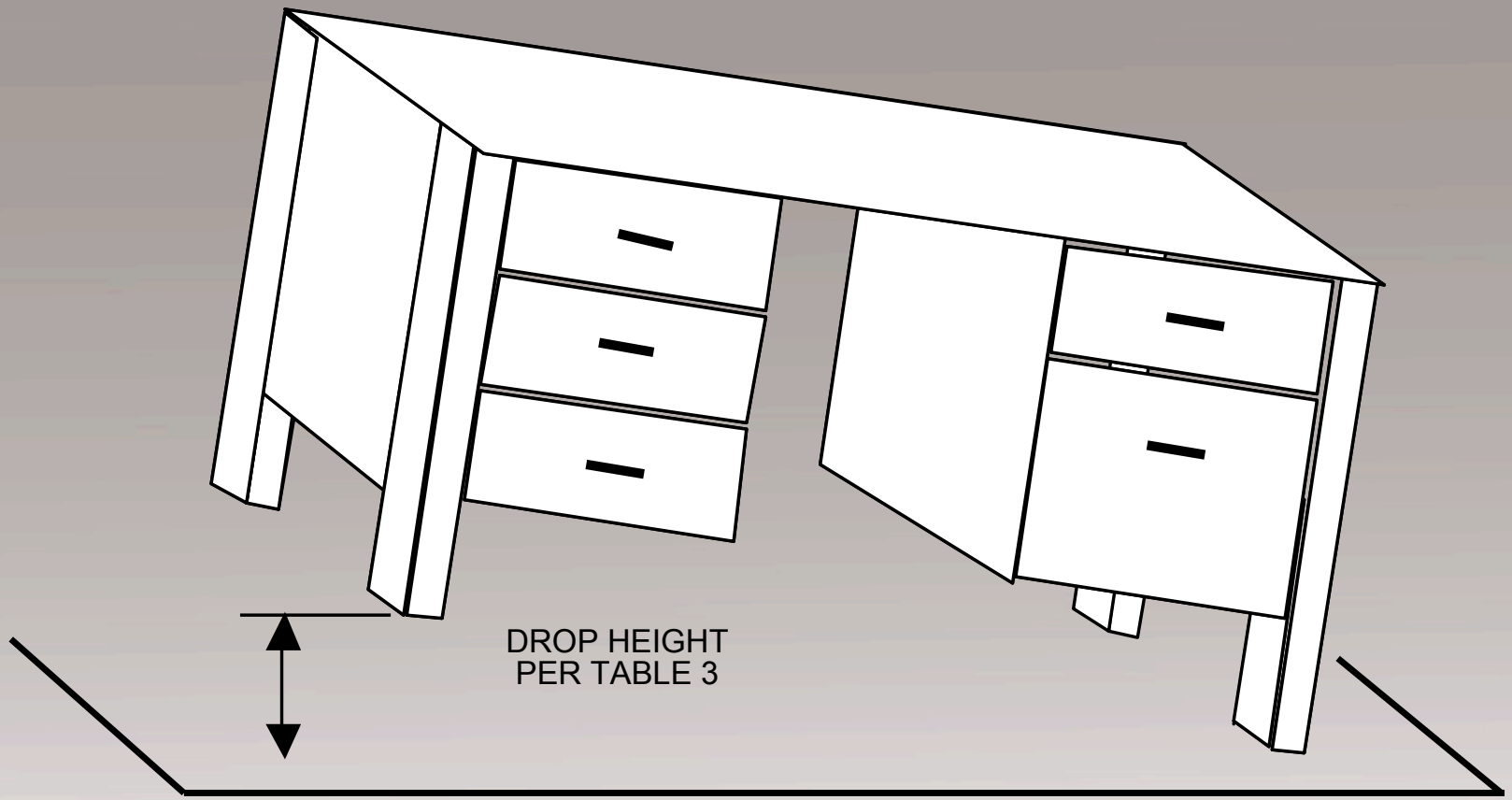
GLIDES “NOT CONNECTED”



T-LEGS TESTED AS SHOWN

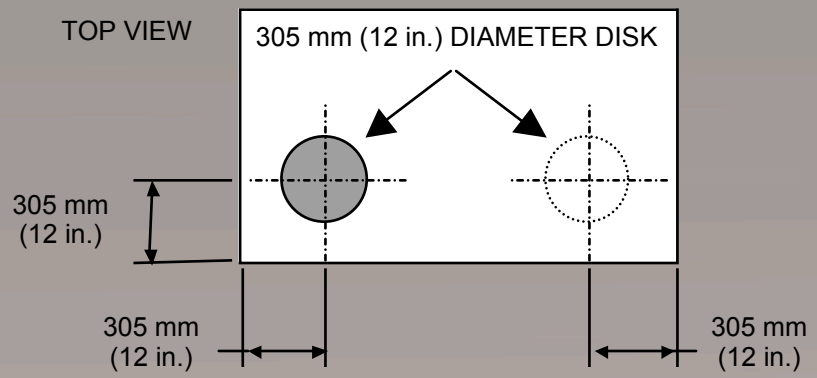
Unit Drop Test

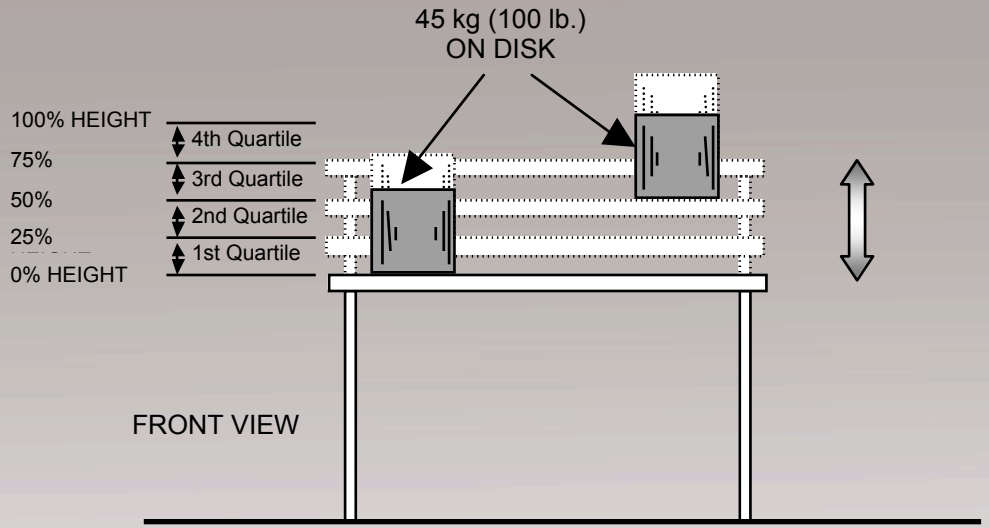
The purpose of this test is to determine the ability of a desk/table unit to withstand an impact force on the legs, column or base.



Vertical Adjustment Test

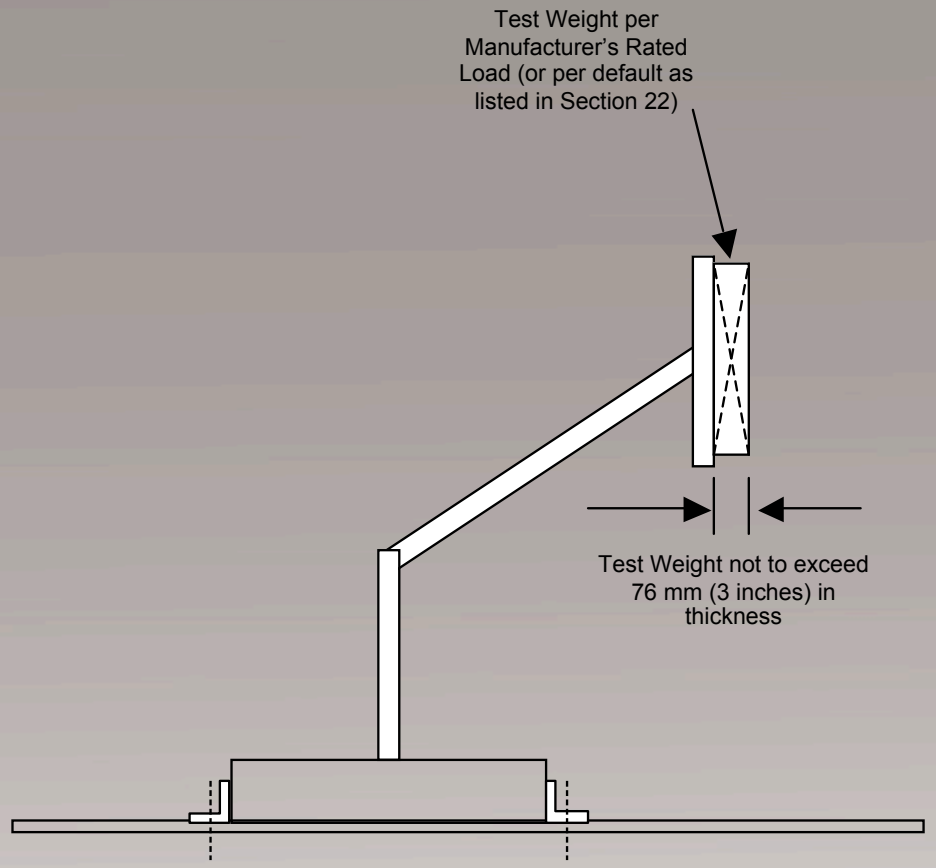
The purpose of this test is to determine the ability of user adjustable surfaces to be cycled through their range of adjustment under load.





Monitor Arm Tests

Several Monitor Arm tests were added to X5.5 in the 2014 revision.



ANSI/BIFMA M7.1 Furniture Emissions Test Method

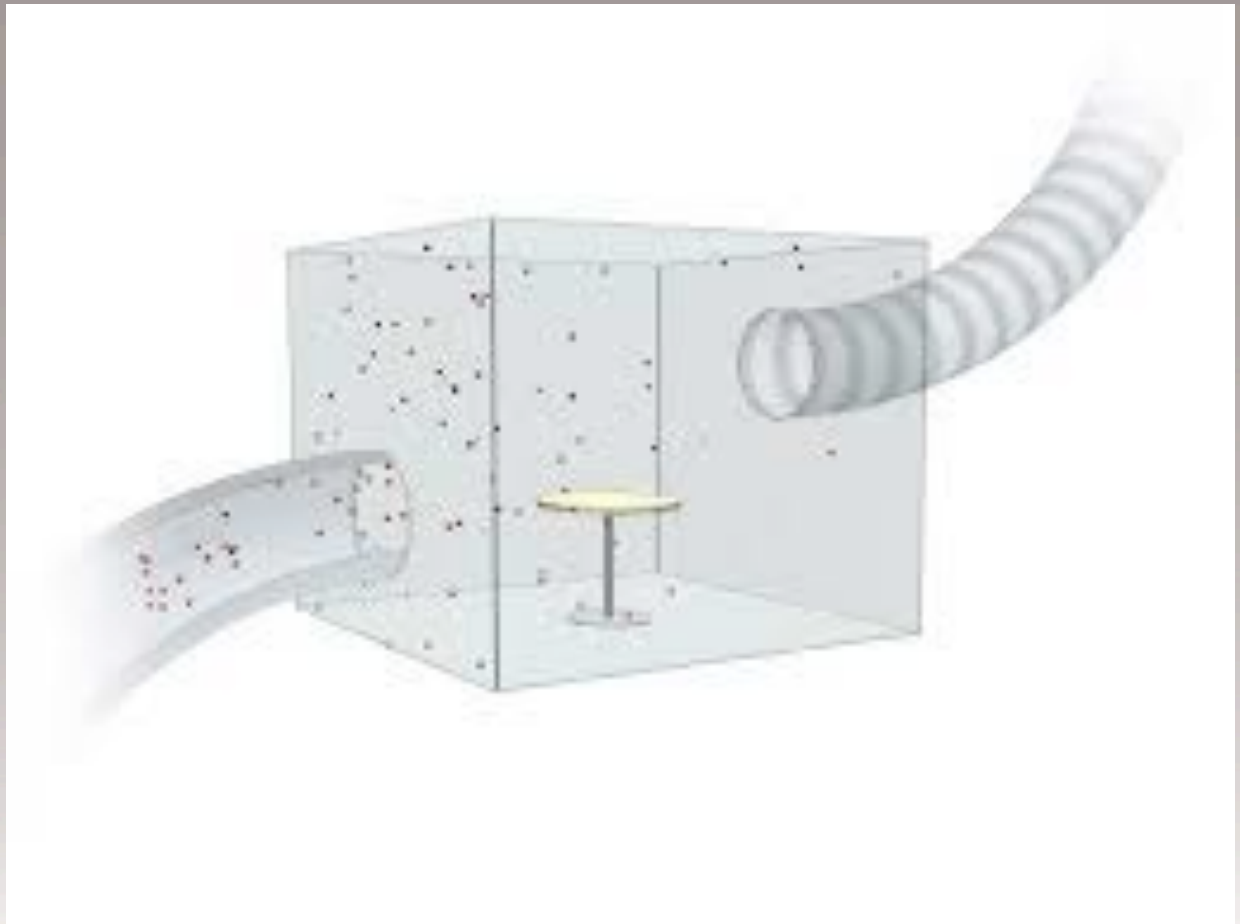
For determining VOC emissions from furniture under environmental and usage conditions that are typical of those found in buildings.

ANSI/BIFMA X7.1 Low-emitting Furniture Standard

This standard specifies acceptance levels that define low-emitting furniture (as tested per M7.1).

Furniture Emissions Testing

Sample preparation and timing is very critical. Chamber testing is conducted for 7 days. The standard is very flexible with respect to loading (area) and chamber size.



ANSI/BIFMA e3 Furniture Sustainability

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.

BIFMA G1 Ergonomics Guideline

Uses principles and design considerations from ISO.

Focused on North America with data from the Civilian American and European Surface Anthropometry Resource (CAESAR).

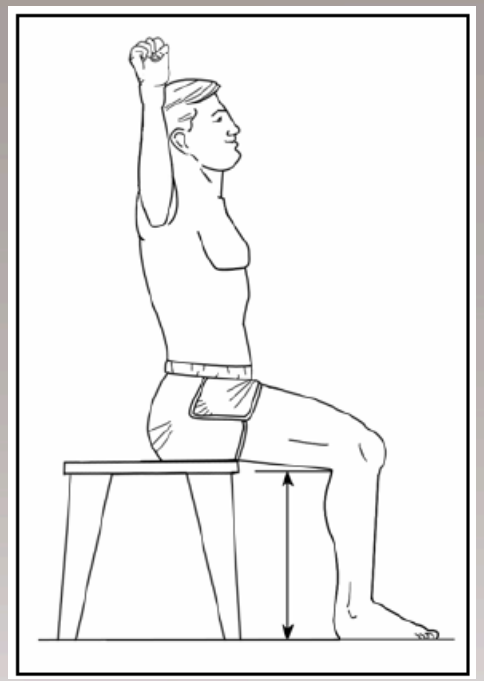
Intended to be recommendations, not requirements. Yet often the market requires strict conformance!

Applies to adults – not children.

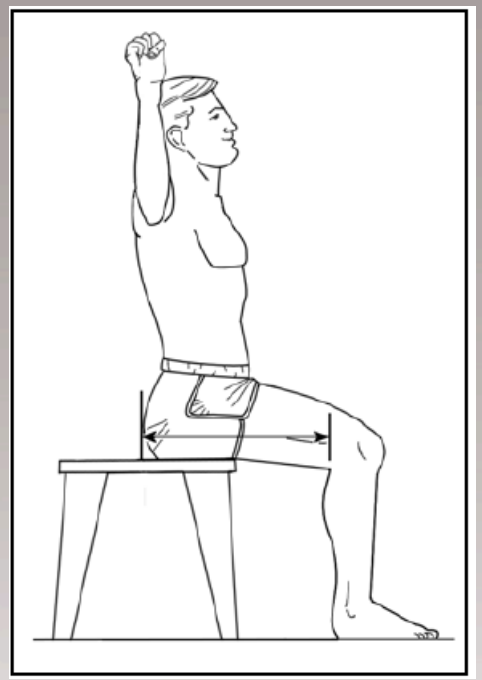
Note – BIFMA and BIFMA member companies have worked with Dr. Matt Reed from the University of Michigan.

Anthropometric Measurements Used to Develop Ergonomic Seating Requirements

Popliteal Height

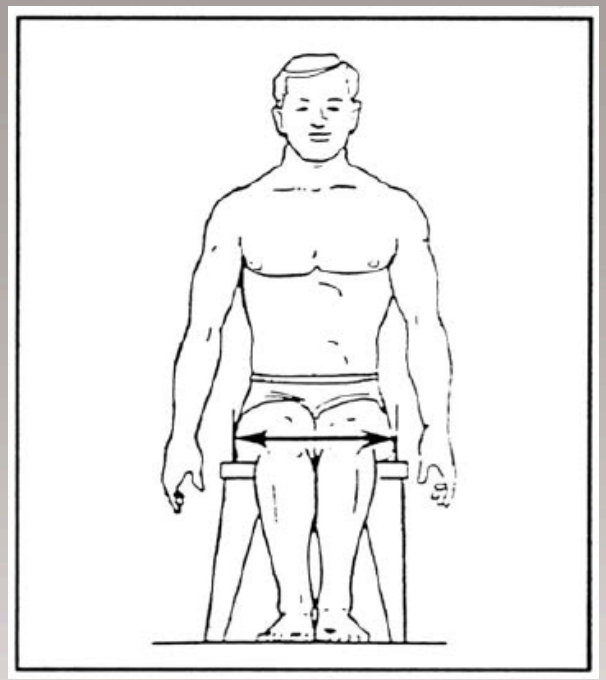


Buttock-Popliteal Height

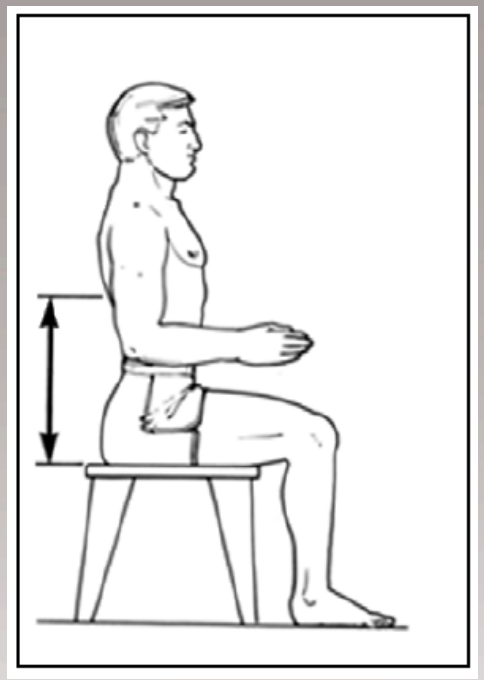


Anthropometric Measurements Used to Develop Ergonomic Seating Requirements

Hip Breadth, Sitting

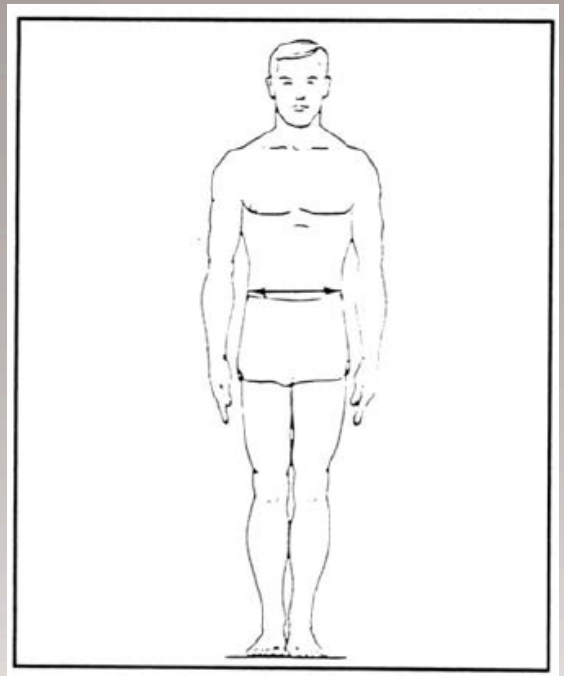


Tenth Rib Midspine, Sitting

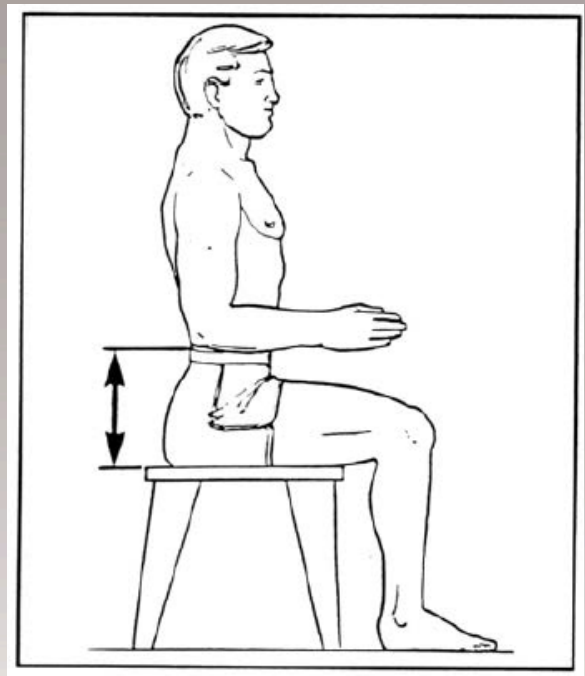


Anthropometric Measurements Used to Develop Ergonomic Seating Requirements

Bi-Cristale Breadth, Standing

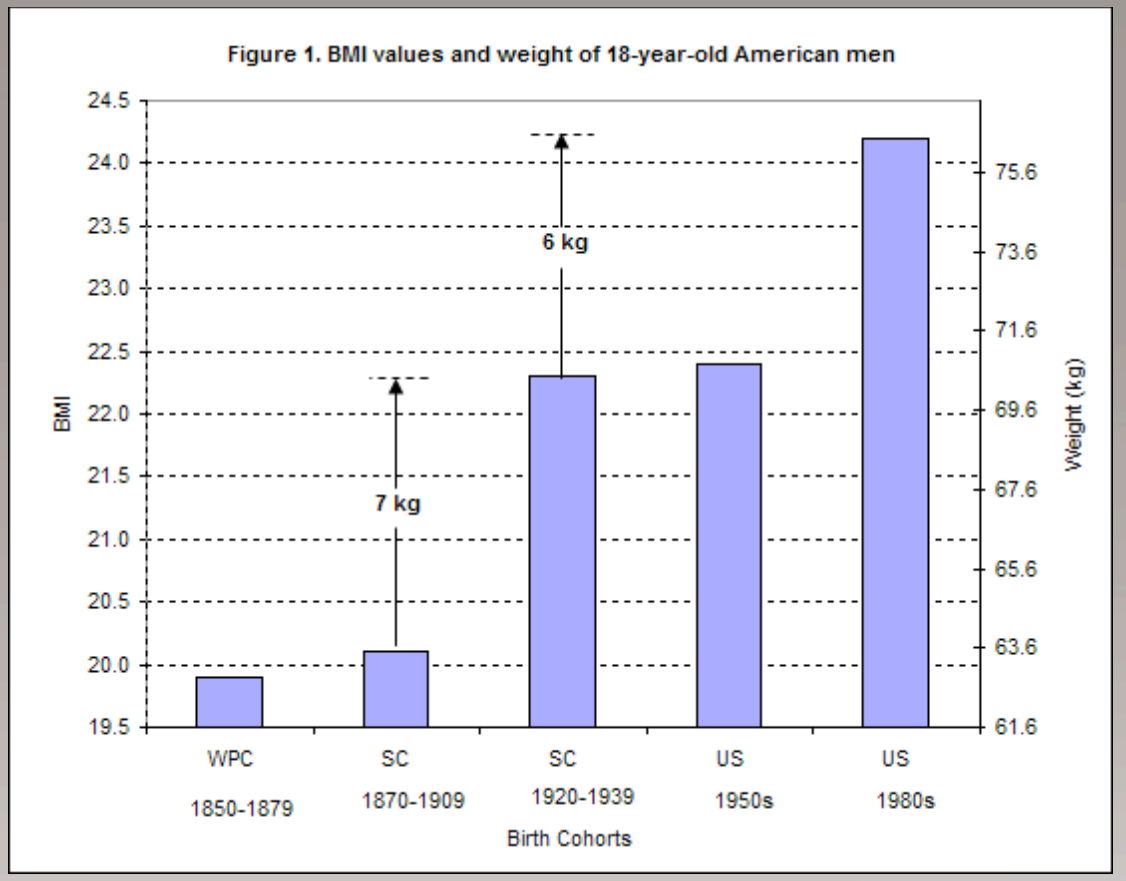


Elbow Height, Sitting



Historical BMI values & weights

18-year-old American men (70-inches tall)



Marek Brabec – Statistician for National Institute of Public Health (2010)

ANSI/BIFMA X5.11-2015
Seat Width Measurement

The BIFMA G1-2013 Ergonomics Guideline suggests a minimum seat width requirement of **19.2 inches** (90^{th} percentile female).

ANSI/BIFMA X5.1-2011 General-Purpose Office Chairs does not require a seat width minimum. ANSI/BIFMA standards are largely safety and performance.

ANSI/BIFMA X5.11-2015 has a unique dimensional requirement. Seat widths must be at least **22.0 inches** wide.

Considering expanding the Ergonomics Guide to include larger users or to create another Ergonomics Guide (G2).

LARGE OCCUPANT SEATING

Considering expanding X5.4 Lounge/Public Seating up to 400 lbs.

Considering a new Healthcare Seating Standard at 401 – 600 lbs.

Estimated number of US people 400 lbs & over in 2011 between ages 20-79: **450,688** and is expected to increase.

For 401 – 600 lbs. minimum seat width is expected to be **26.0 inches**.

Upholstered Furniture Flammability

California Technical Bulletin TB-117-2013 is a cigarette smolder test. This is the most widely used specification for seating fire safety.

According to repeated nationwide surveys,

More Doctors Smoke CAMELS than any other cigarette!

Doctors in every branch of medicine were asked, "What cigarette do you smoke?" The brand named most was Camel!

THE DOCTORS' CHOICE IS AMERICA'S CHOICE!

For 30 days, test Camels in your "T-Zone" (T for Throat, T for Taste).

For a better start in life start COLA earlier!

- Promotes Active Lifestyle!
- Boosts Personality!
- Gives body essential sugars!

How soon is too soon?

Not soon enough. Laboratory tests over the last few years have proven that babies who start drinking soda during that early formative period have a much higher chance of gaining acceptance and "fitting in" during those awkward pre-teen and teen years. So, do yourself a favor. Do your child a favor. Start them on a strict regimen of sodas and other sugary carbonated beverages right now, for a lifetime of guaranteed happiness.

The Soda Pop Board of America
1515 W. Hart Ave. - Chicago , ILL.

How Mother and Baby "Picked Up"

A case of Blatz Beer in your home means much to the young mother, and obviously baby participates in its benefits.

The malt in the beer supplies nourishing qualities that are essential at this time and the hops act as an appetizing, stimulating tonic.

Main 2400

BLATZ

MILWAUKEE

Always the same good old Blatz

PROTECT YOUR CHILDREN

Against Disease-Carrying Insects!

TRIMZ DDT
REG. U. S. PAT. OFF.
CHILDREN'S ROOM WALLPAPER and Ceiling Paper

KILLS FLIES, MOSQUITOS, ANTS

. . . as well as moths, bedbugs, silverfish and other household pests after contact!

MEDICAL SCIENCE KNOWS many common insects breed in filth, live in filth and carry disease. Science also recognizes the dangers that are present when these disease-carrying insects invade the home. Actual tests have proved that *one* fly can carry as many as 6,600,000 bacteria! Imagine the health hazard – especially to children – from flies seriously suspected of transmitting such diseases as scarlet fever, measles, typhoid, diarrhea . . . even dread polio! Some types of mosquitos carry malaria and yellow fever. And *any* mosquito bite is painful and easily infected when scratched.

NON-HAZARDOUS to children or adults, to pets or clothes. *Certified* to be absolutely safe for home use. Tested and commended by *Parents' Magazine*.

GUARANTEED effective against disease-carrying insects for 1 year. Actual tests have proven the insect-killing properties still effective after 2 years of use.

NO SPRAYS! NO LIQUIDS! NO POWDERS! So convenient, so safe because the DDT is fixed to the paper. It *can't* rub off!

BEAUTIFUL! "Jack and Jill" or "Disney Favorites" – gay new patterns that *protect* as they *beautify* a child's room.

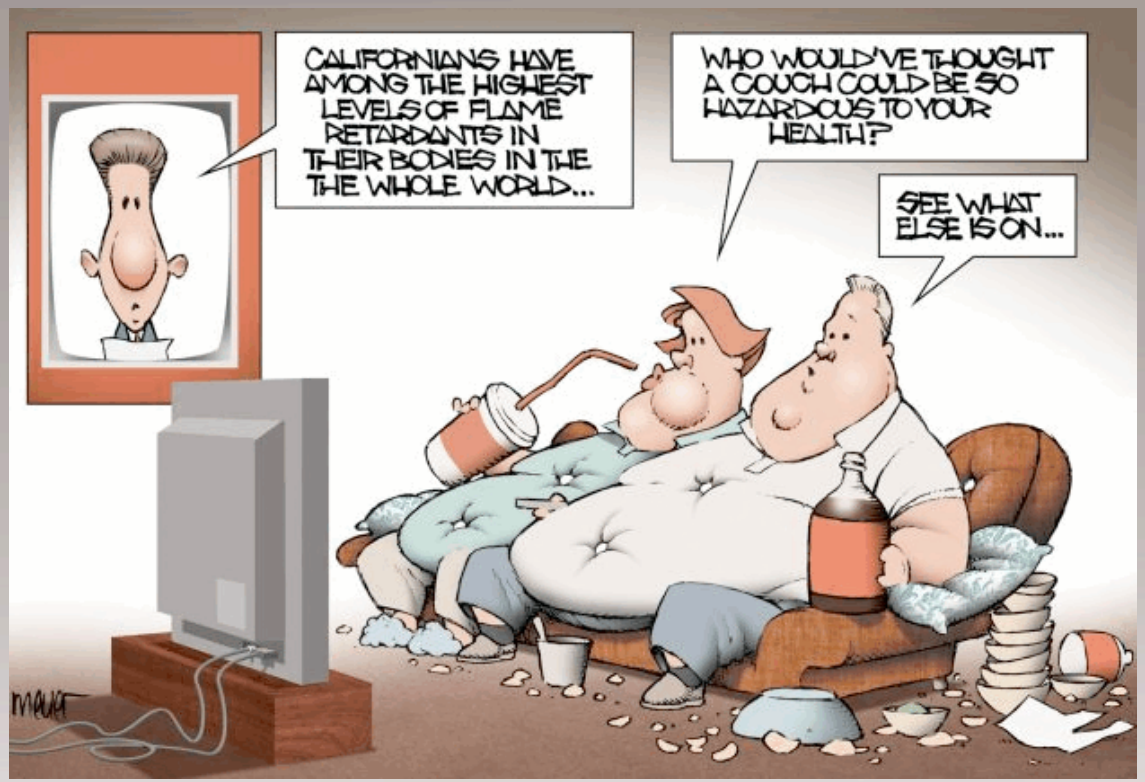
DDT CEILING PAPERS, TOO! *Extra* protection for your children's room – for every other room in the house. Choice

Upholstered Furniture Flammability

California Technical Bulletin TB-133 is a full scale burn test. Sometimes specified for un-sprinkled and limited egress occupancies.

Upholstered Furniture Flammability

California and other specifiers have moved from open flame to cigarette smolder requirements given such low fire risk and concerns with the flame retardant chemicals.



http://toxicfreefiresafety.org/CaliforniansForToxicFreeFireSafety.php

International Standards Activity

Several USA experts participate on the ISO Technical Committee 136 for Furniture.

- Work Group 1 – Chairs
- Work Group 2 – Desk/Table Products
- Work Group 3 – Storage Units
- Work Group 4 – Beds
- Work Group 5 – Kitchen
- Work Group 6 – Children's / Nursery

Note – The US will be hosting ISO TC 136 meetings in Chicago in June 2017

International Standards

BS EN 1729
2006 Furniture, chairs and tables for educational institutions
Part 1: Functional dimensions.

BS EN 1729
2006 Furniture, chairs and tables for educational institutions
Part 2: Safety requirements and test methods.

BS 7176
1995 Specification for resistance to ignition of upholstered furniture for non-domestic seating by testing composites.

International Standards

SANS 660:2012, Edition 3.5
South African National Standard – Classroom furniture

AS/NZS 4610.3:1999
Australian/New Zealand Standard Furniture – School and educational

ISO 5970:1979
Furniture – Chairs and tables for educational institutions – Functional sizes

USA Experts Participated in the Development of an International Chair Measurement Device

BIFMA

BUSINESS + INSTITUTIONAL FURNITURE MANUFACTURERS ASSOCIATION

Summary

The ANSI process is important to the validity of ANSI/ BIFMA standards.

There are several ANSI / BIFMA standards for institutional (education market) furniture products.

Flammability and International work have taken high priority in recent years.

Standards for large people are in the works.

Go to www.bifma.org for the full listing of commercial furniture standards.

BIFMA

BUSINESS + INSTITUTIONAL FURNITURE MANUFACTURERS ASSOCIATION

Thank You

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