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Forward

SEFA Profile

The Scientific Equipment and Furniture Association (SEFA) is an international trade association comprised of manufacturers of laboratory furniture, casework, fume hoods and members of the design and installation professions. The Association was founded to promote this rapidly expanding industry and improve the quality, safety and timely completion of laboratory facilities in accordance with customer requirements.

SEFA Recommended Practices

SEFA and its committees are active in the development and promotion of Recommended Practices having domestic and international applications. Recommended Practices are developed by the association taking into account the work of other standard writing organizations. Liaison is also maintained with government agencies in the development of their specifications.

SEFA’s Recommended Practices are developed in and for the public interest. These practices are designed to promote a better understanding between designers, architects, manufacturers, purchasers, and end-users and to assist the purchaser in selecting and specifying the proper product to meet the user’s particular needs. SEFA’s Recommended Practices are periodically updated. The Recommended Practices are numbered to include an annual suffix which reflects the year that they were updated. SEFA encourages architects to specify these Recommended Practices as follows: “SEFA 8W-2010”.

SEFA Glossary of Terms

SEFA has developed a Glossary of Terms (SEFA 4-2010) for the purpose of promoting a greater understanding between designers, architects, manufacturers, purchasers and end users. The terms defined by SEFA are frequently used in contracts and other documents, which attempt to define the products to be furnished or the work involved. The Association has approved this Glossary in an effort to provide uniformity among those who use these terms. Where a specific Recommended Practice contains definitions which differ from those in the Glossary of Terms, then the definitions in the specific Recommended Practice should be used.

SEFA encourages all interested parties to submit additional terms or to suggest any changes to those terms already defined by the Association. The definitions should be used to help resolve any disputes that may arise or to incorporate the applicable terms in any contract or related documents.

SEFA Disclaimer

SEFA uses its best effort to promulgate Recommended Practices for the benefit of the public in light of available information and accepted industry practices. SEFA does not guarantee, certify, or assure the safety or performance of any products, components, or systems tested, installed, or operated in accordance with SEFA Recommended Practices or that any tests conducted under its Recommended Practices will be non-hazardous or free from risk.

Note: Testing as described in this document must be performed and documented by a SEFA-approved third party testing facility. See Page 292.
1.0 Scope

The scope of this document is intended to provide manufacturers, specifiers, and users tools for evaluating the safety, durability, and structural integrity of wood laboratory grade furniture and complementary items. This document is inclusive of casework (base units, wall mounted units, counter mounted units, tall units), shelving and table systems. Casework, shelving, and tables, manufactured for laboratory use should be subjected to the following tests and procedures. Great care should be exercised when heavy loads are applied to the cabinet and appropriate safety precautions taken to insure safety to testing personnel. All tests should be performed by properly trained personnel. SEFA assumes no liability for damage or injury as a result of conducting these tests.

The acceptance levels are based on the cumulative field experience and laboratory testing of SEFA members based on actual needs of laboratories.

This is a performance based document. Specifications prescribing specific materials, hardware, finish, workmanship or construction may or may not meet acceptance levels of this document. If prescriptive components of the specifications conflict with compliance of this document then the Architectural prescribed elements take precedence.

**Testing as described in this document must be performed and documented by a SEFA-approved third party testing facility.**

2.0 Purpose

The purpose of this document is to describe the means of evaluating the function and safety of wood laboratory grade furniture and complimentary items. Cabinets shall be of a type specifically designed and manufactured for installation and use in a laboratory. Cabinet hardware and materials shall be of appropriate quality and type for the purpose intended. Construction shall conform to best practices of the scientific casework industry. Joints and corners shall be well fitted, eliminating unsightly openings and seams. Product finish shall be resistant to chemical spills and splashes common to a typical laboratory operation. Structural strength shall be adequate to support heavy laboratory apparatus, high density shielding, or containers and heavy instruments.

SEFA 8-W wood laboratory grade furniture shall consist of modular base cabinets, wall cabinets, counter mounted cabinets, tall cabinets, shelving and tables. A wood cabinet consists of top, top frame rail, bottom, end panels and a back and shall be constructed of plywood. Door and drawer fronts shall be constructed of plywood and/or solid wood.

3.0 Definitions

**Acceptance Levels** - The acceptance level for each performance criteria is based on the cumulative experience of actual field-testing and laboratory results of SEFA members. Acceptance levels describe the expected outcome of each test procedure.

**ANSI** - ANSI is the American National Standards Institute. Approval of an American National Standard requires verification by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer.

**Apparatus** - A machine or group of machines and accessories.

**Arithmetic Mean** - A number obtained by dividing the sum of a set of quantities by the number of quantities in a set; average.


**Base Cabinets** - A base cabinet is a storage device usually consisting of two sides, a bottom, a back, and top or top frame. A base cabinet is mounted on the floor and normally supports a work surface. The work surface is nor-
mally no more than 42" (1,067mm) above the floor surface.

**Cabinet Depth (Deep)** - Given a front, bottom, two sides, and a top, the cabinet depth is a measure of the side of the cabinet, in its normal upright position, from the outside back to the outside front excluding doors and door fronts.

**Cabinet Height (High)** - Given a front, bottom, two sides, and a top, the cabinet height is a measure of the side of the cabinet, in its normal upright position, from the bottom to the top, excluding any additional work surface.

**Cabinet Width (Wide)** - Given a front, bottom, two sides, and a top, the cabinet width is a measure of the outside front of the cabinet in its normal upright position from one side to the other.

**Casework** - Base and wall cabinets, display fixtures, and storage shelves. The generic term for both cabinets and special desks, reception counters, nurses stations and the like. May includes the tops and work surfaces.

**Chase (Plumbing Area)** - Space located behind the back of the base cabinet used to house plumbing and data lines.

**Composition Core** - A core material using particleboard, MDF, or agrifiber product.

**Counter Mounted Cabinet** - A counter mounted cabinet is a wall cabinet (usually with a height of approximately 48" [1,219mm] and is typically mounted on the work surface or shelf, as in a reagent shelf).

**Cupboard (Door Unit)** - That portion of the cabinet with no drawer(s) and may be enclosed by door(s).

**Combination Unit** - A base unit of the type that has both door(s) and drawer(s).

**Drawer** - A sliding storage box opened by pulling out and closed by pushing in.

**Free Standing** - Requiring no support or fastening to other structures.

**Hardware** - Manufactured items added to cabinets. These include but are not limited to screws, pulls, hinges, drawer slides, locks, label holders and latches.

**Joinery** – method by which two components are intended to be permanently connected.

**Laboratory Furniture** - Furniture specifically designed, engineered and manufactured for installation and use in a laboratory.

**Latch** - A piece of hardware designed to hold a door closed.

**Leveling Screws (Levelers)** - Threaded components designed to allow adjustment of the cabinet vertically as needed for leveling.

**Medium Density Fiberboard (MDF)** – A panel or core product manufactured from wood fibers combined with a synthetic resin or other bonding system. MDF is manufactured with a medium density of 497 kg/cubic meter (31 lb/cubic foot) up to 881 kg/cubic meter (55 lb/cubic foot) by the application of heat and pressure by a process in which the fiber bond is substantially created by the added adhesive system.

**Particleboard** - A panel or core product composed of small particles of wood and wood fiber that are bonded together with synthetic resin adhesives in the presence of heat and pressure.

**Permanent Damage** - Destruction to material or joinery that is not repairable.

**Permanent Deformation** - Deflection that has exceeded the plastic limit, thus changing the original shape of the product.

**Permanent Deterioration** - Erosion or corrosion of material such that the component will never return to its original condition.
Permanent Failure - See: "permanent damage."

Plywood – A panel composed of an assembly of layers or plies of veneer or veneers in combination with lumber core, particleboard core, MDF core, hardboard core, or special core or special back material joined with an adhesive. Except for special constructions, the grain of alternate plies is at right angles and the face veneer is hardwood.

Pulls - Items used to grasp and operate (open/close) the door or drawer (see also hardware).

Rack Resistance - The ability of a product to resist stresses that tend to make the product distort.

Rail - A component usually 6” wide or less extending horizontally from one side of the cabinet to the other.

Reagent - A substance used because of its chemical or biological activity.

Removable Back - A panel located on the inside back of the base cabinet, which is removable in order to gain access to the plumbing area.

Shelving - A flat panel supported horizontally in a cabinet interior, wall, or other support structure used to hold objects.

Stainless Steel - Steels containing more chromium than the 12% necessary to produce passivity (less reactive), but less than 30%. These steels resist corrosion under normal conditions and are usually non-magnetic.

Submersion - Covered with water.

Tables - An article of furniture having a flat, horizontal surface supported by one or more support members (legs), and a frame (apron).

Tall Cabinet (Full Height Unit) - A tall cabinet is a storage devise that consists of two sides, a bottom, a top, a back, and a face. The face may be open to access the storage area or may be outfitted with one or more drawers and/or door(s). A tall cabinet is always mounted on the floor and is nominally above 60” (1524mm) high.

Torsion – A force acting at a distance which tends to twist or rotate an object or cabinet.

Uniformly Distributed – A force applied evenly over the area of a surface.

Unobstructed Entry - A cabinet is deemed to be unobstructed if access to the entire storage area is completely without obstacle.

Upright Position - A cabinet oriented in its intended position.

Veneer Core Plywood – A panel or core product composed of an odd number of thin veneer layers that are bonded together with an adhesive. Except for special constructions, the grain of alternate plies is at right angles. All plies shall be combinations of species, thickness, density, and moisture content to produce a balanced panel. All inner plies, except the innermost ply, shall occur in pairs.

Wall Cabinet - A wall cabinet is a storage device consisting of two ends, a back, a top, bottom, and a face. The face may be open to access the storage area or may be outfitted with one or more door(s). The wall cabinet usually does not include a drawer. A wall cabinet is always mounted on a vertical surface such as a wall, a divider, panel or some other vertical structure. A wall cabinet is usually less than 48” (1,219mm) high.

Work Surface - A normally horizontal surface used to support apparatus at a convenient height off the floor. Work Surfaces are normally positioned atop a base cabinet or table structure.

3.1 Description of Testing Apparatus

Solid Steel Bar - A square solid steel bar 2 1/2” (63mm) square, 28 1/4” (717mm) long,
weighing 50 pounds (22.679 Kg).

**Sand or Shot Bag** (10 pounds [4.545 Kg]) - A bag of plastic or cloth with the approximate dimensions 10 9/16” (268mm) x 11” (279mm) as in typical "gallon size re-closable storage bags." Filled with enough sand or shot so that contents weigh 10 pounds (4.545 Kg).

**Sand Bag** (20 pounds [9.071 Kg]) - Two 10 pound (4.545 Kg) sand bags bound together.

**Shot Bag** (100 lbs. [45.359 Kg]) - A plastic or cloth bag of sufficient size to contain 100 pounds (45.359 Kg) of shot.

**Cycling Mechanism** - Per ANSI BHMA 156.9.-2003

**Steel Rod** - A 2” (51mm) diameter by 12” (305mm) long rod, approximately 10 pounds (4.535 Kg) in weight.

**Hot Water** - To be considered "hot water," the temperature of the water must be between 190º F to 205º F (88º C to 96º C).

**One Pound Ball** - Solid steel sphere approximately 2” (51mm) in diameter.

**Hardwood Corner Block** - A block of hardwood 2” (51mm) square by 1” (25.4mm) high.

### 4.0 Base Cabinets

#### 4.1 Description of Test Cabinet

The base cabinet shall be a combination of cupboard and drawer per Figure 1. The base cabinet shall be 48" +/- 1” wide, 36" +/-1” high, and 22" +/-1” deep. Cabinet dimensions do not include drawer or door front thickness. The drawer shall be above the cupboard, full width and approximately one-fourth the height of the cabinet's face opening. Drawer shall be a minimum of 18” deep outside dimension. When slides are used for drawers, slides shall be a minimum of 18” deep. Cupboard shall be double-door design and provide unobstructed entry into the cabinet interior with the doors open. The unit shall contain one adjustable shelf. The cabinet back shall be the removable type (per manufactures standard design as used for access to the plumbing or chase area) with the removable panel removed. Removable panel to be a minimum 36”x18” (914.4 Kg x 457.2 Kg). The cabinet shall have full height end panels with integral toeboard. The cabinet shall be free standing, squared and sitting 1” (25.4mm) off the floor atop four hardwood corner blocks 2” (50.8mm) square and 1” (25.4mm) high. A top of 1” (25.4mm) thick 37-50 pcf medium density fiberboard shall be positioned on the cabinet without glue or fasteners of any kind. The top dimensions will be such that it will overhang the cabinet perimeter by 1” (25.4mm).

Before conducting the test, a visual examination shall be conducted to verify that the unit configuration and setup conditions are appropriate. Operate doors and drawer. Doors should be free moving and latch properly. Inspect the unit for dimensions and note the fit of doors and drawers to the cabinet body. Open and close the drawer. The drawer should be free moving and function as specified by the manufacturer. Discontinue evaluation if unit is not in compliance or if malfunction is noted.

![Figure 1. Description of Test Base Cabinet.](image-url)
Although aggregate test results may vary from manufacturer to manufacturer, procedures for testing performance criteria shall be as outlined in this document and results made available upon request. It is assumed that the test model reflects the performance criteria for all products regardless of construction, size, or style used. A test unit has been identified in this document with the sole purpose of obtaining continuity of procedures and results in a scientific format.

4.2 Cabinet Load Test

4.2.1 Purpose of Test

The cabinet load test will challenge the structural integrity and load bearing capability of the cabinet construction. Regardless of countertop selection or attachment of cabinet to wall or floor, this test will demonstrate the ability of the cabinet to support heavy applied loads. This is not intended to test the functional characteristics of the cabinet under heavy loads.

4.2.2 Test Procedure

Verify that the cabinet is level. Remove drawer and open doors for testing purpose. Load the cabinet top by using 2000 pounds (907.184 Kg) of solid steel bars (per Section 3.1) stacked four high and spaced per Figure 2. After 24 hours, unload the cabinet.

4.2.3 Acceptance Level

The cabinet will have no permanent failure.

4.3 Cabinet Concentrated Load Test

4.3.1 Purpose of Test

The purpose of this test is to challenge the functional characteristics of the cabinet when subjected to a concentrated load on the center of the cabinet top.

![Figure 3. Base Cabinet Concentrated Load Test](image)

4.3.2 Test Procedure

Using solid weights, apply a total of 200 pounds (90.718 Kg) to the top of the cabinet along the cabinet centerline (see Figure 3). After a period of 24 hours before removal of test load, operate doors and drawers.

4.3.3 Acceptance Level

Under condition of test load, doors and drawer shall operate normally. There shall be no permanent distortion to front rail, cabinet joinery, doors, or drawers.

4.4 Cabinet Torsion

4.4.1 Purpose of Test

This test will evaluate the structural integrity of the cabinet construction when subjected to a torsional load.
4.4.2 Test Procedure

The cabinet shall be tested in its normal upright position, raised not less than four-inches off the floor and supported on rear and one front corner. The area of support under the cabinet shall be located not more than 6" (152.4mm) in from each supported corner. Secure the cabinet diagonally from the unsupported corner with seven solid steel bars per Section 3.1 (350 pounds (158.757 Kg) of weight), on the top of the cabinet to prevent overturning. Apply four solid steel bars (200 pounds [90.718 Kg] of weight) to the unsupported corner for a period of 24 hours (see Figure 4). Remove weight and place cabinet on the floor in its normal upright position. Observe cabinet joinery. Level the cabinet and measure the face and back of the cabinet across the diagonal corners.

4.4.3 Acceptance Level

When returned to normal position, the operation of the cabinet shall be normal, and there will be no permanent damage. The difference between the two measurements taken from measuring the diagonal corners shall be no more than 1/8" (3.175mm).

4.5 Cabinet Submersion Test

4.5.1 Purpose of Test

This test will demonstrate the ability of a cabinet to resist wicking of moisture from the floor. Only units that rest on the floor or a unit where the base is within 2" (50.8mm) of the floor should be subjected to this test.

4.5.2 Test Procedure

The material thickness along the perimeter of the cabinet shall be measured on 6" (152.4mm) increments. Record the thickness of the material to be submerged in water. Calculate the arithmetic mean of the data taken. Place the entire test cabinet in its upright position such that the cabinet is submerged in a pan filled with 2" (50.8mm) of water. After 4 hours, remove the unit from the water and immediately measure the thickness of the material at the same points measured initially. Calculate the new arithmetic mean. After the unit has been allowed to dry, inspect for other damage.

4.5.3 Acceptance Level

The cabinet will show no permanent deformation or deterioration. Increase in thickness shall not exceed ten percent of the initial mean measurements.

4.6 Spill Containment Test

Not applicable for Wood Cabinets.

5.0 Doors

5.1 Door Hinge Test

5.1.1 Purpose of Test

This test will demonstrate the durability of the door, door attachment and its hardware (hinge leaf, screws, etc.) to an applied load of 200 pounds (90.72 Kg).

5.1.2 Test Procedure

Remove the shelf for this test. With unit and top set as described in Section 4.1, add sufficient weight to the top in order to prevent overturning. With cabinet door opened 90-degrees, hang a sling made up of two 100 pound (45.359 Kg) weights (shot bags or solid
weights) over the top of the door at a point 12" (304.8mm) out from the hinge centerline (see Figure 5). Slowly move the door through one full cycle of the hinge at 160-degree arc. Remove weight and swing the door through its full intended range of motion and close door.

5.1.3 Acceptance Level

The open door shall withstand a load of 200 pounds (90.72 Kg) when applied at a point 12" (304.8mm) from the hinge centerline without permanent damage. Operation of the door, after test shall show no significant permanent damage that will cause binding of the door or hinges or that will adversely affect operation of the catch.*

*Certain unit configurations require hinge location to be such that load ratings are lower than the test model. Consult manufacturer for details.

5.2 Door Impact Test

Not Applicable to Wood Casework

5.3 Door Cycle Test

5.3.1 Purpose of Test

This test will demonstrate the durability of the door hinge hardware to withstand 100,000 cycles as a reliable measure for longevity.

5.3.2 Test Procedure

This test shall be in conformance to the ANSI test procedure A156.9, Grade 1, requirements for cycle testing of doors. A cycling mechanism shall swing door 90-degrees. Door shall operate for 100,000 cycles continuously, without hinge adjustment, at a speed of 15 cycles per minute.

5.3.3 Acceptance Level

Door shall operate for the full cycle period without deterioration that will affect the function of the door. The door shall operate freely without binding.

6.0 Drawers

6.1 Drawer Static Test

6.1.1 Purpose of Test

This test will demonstrate the ability to support a point load given to the front of the drawer and will challenge the drawer suspension system and the attachment of the drawer head to the drawer.

6.1.2 Test Procedure

With unit and top set as described in Section 4.1, add sufficient weight to the top in order to
prevent overturning. Open the drawer to 13" (330.2mm) of travel and hang 150 pounds (68.038 Kg) from the drawer head at the centerline of the drawer for five minutes. Remove the weight and operate the drawer through the full cycle.

6.1.3 Acceptance Level

There shall be no interference with the normal operation of the drawer and the drawer head should remain tightly fastened to the drawer.

6.2 Drawer and Door Pull Test

Not Applicable to Wood Casework.

6.3 Drawer Impact Test

6.3.1 Purpose of Test

This test will demonstrate the resistance to impact of the drawer bottom.

6.3.2 Test Procedure

Remove drawer; support each corner with 2"x2"x1" (50.8 x 50.8 x 25.4 Kg) supports.

Drop a 10 pound (4.545 Kg) sand or shot bag from a height of 24" (609.6 mm) into the bottom of the drawer at the center of the width of the drawer. Remove the sand or shot bag.

6.3.3 Acceptance Level

No damage or breakout of the drawer bottom.

6.4 Drawer Internal Rolling Impact

6.4.1 Purpose of Test

This test will evaluate the strength of the drawer head, bottom, and back as a result of opening and closing the drawer with a rolling load.

6.4.2 Test Procedure

Position the drawer on a table at a 45-degree angle per Figure 7. Place a 2" (50.8mm) diameter by 12" (304.8mm) long steel rod (approximately 10 pounds [4.545 Kg]) 13" (330.2mm) from the target impact area such that the rod will roll freely to impact the back of the drawer. Subject the back to three impacts and reverse the drawer to subject the front to three additional impacts.

6.4.3 Acceptance Level

The drawer shall show no permanent damage.
All joinery shall be intact and the drawer, when replaced in the unit, shall operate normally. Minor scratches and dents are acceptable.

6.5 Drawer Cycle Test

Mechanical and Non-Mechanical drawer suspension systems are addressed in this Section. When specifiers require SEFA-8 Wood certified cabinets yet fail to stipulate a drawer suspension system then certification will default to cabinets certified with mechanical suspension systems.

6.5.1 Purpose of Test
(Mechanical Suspension System)

This test is intended to test the drawer’s operation under full load. To be considered Laboratory Grade Wood Casework, the mechanical drawer slides must be rated at a minimum, ANSI/BHMA A156.9 Grade 1.

6.5.2 Test Procedure
(Mechanical Suspension System)

Mechanical Suspension Systems – A dynamic load of 75 pounds (34.019 Kg) shall be uniformly distributed in the drawer (using ten 7 ½ pound (3.401 Kg) sand or shot bags per Section 3.1). Measure force required to activate the drawer. Operate over the full range of motion without engaging bumpers, stops or self-closing features for 50,000 cycles at a rate not to exceed 8 - 12 cycles per minute.

6.5.3 Acceptance Level (Mechanical Suspension System)

The drawer shall operate freely without evidence of binding. The force required to open and close loaded drawer shall not be greater than 8 pounds to activate.*

6.5.4 Test Procedure (Non-Mechanical Suspension System)

Non-Mechanical Suspension Systems – A dynamic load of 200 pounds (907.184) shall be uniformly distributed in the drawer (using twenty 10 pound (4.5.4 Kg) sand or shot bags per Section 3.1). Measure force required to activate the drawer. Operate over the full range of motion without engaging bumpers, stops or self-closing features for 50,000 cycles at a rate not to exceed 8 - 12 cycles per minute.

6.5.5 Acceptance Level (Non-Mechanical Suspension System)

The drawer shall operate freely without evidence of binding. With 200 pounds (90.718 KG) of evenly distributed load in the drawer the force required to open and close drawer shall not be greater than 40 pounds (18.143 Kg) to activate. With 75 pounds (34.019 Kg) of evenly distributed load in the drawer the force required to open and close drawer shall not be greater than 15 pounds (6.803 Kg) to activate.

*The American’s with Disabilities Act (ADA) requires a force no greater than five pounds to activate hardware. The load rating in this document is intended only for testing conditions where loads challenge the durability of the hardware. Under actual conditions, drawer loading should be reduced to levels that result in compliance with ADA as applicable.

7.0 Shelving

7.1 Description of Unit

Wood shelving shall be tested using the following procedure. The shelves to be tested are as
described in section 9.1 “Description of Test Cabinet”.

7.2 Shelf Load Test

7.2.1 Purpose of Test

This test will demonstrate the ability of a shelf and its mounting hardware to support loads of 40 pounds (18.143 Kg) per square foot, not to exceed 200 pounds (90.718 Kg).

7.2.2 Test Procedure

Load shelf for a period of 24 hours using sand or shot bags weighing 10 pounds (4.54 kilograms) each, load shelf uniformly with 40 pounds (18.14 kilograms) per square foot to a maximum of 200 pounds (90.72 kilograms).

7.2.3 Acceptance Level

After a period of 24 hours, acceptance level shall not be greater than .35 inches under load.

8.0 Cabinet Surface Finish Tests

8.1 Chemical Spot Test

8.1.1 Purpose of Test

The purpose of the chemical spot test is to evaluate the resistance a finish has to chemical spills.

Note: Many organic solvents are suspected carcinogens, toxic and/or flammable. Great care should be exercised to protect personnel and the environment from exposure to harmful levels of these materials.

8.1.2 Test Procedure

Sample substrate will be red oak, rift-cut veneer without stain underneath the coating. Panels to be finished according to finishing supplier’s guidelines and in accordance to casework manufacturer’s standard procedures.

Obtain one sample panel measuring 14" x 24" (355.6mm x 609.6mm). The received sample to be tested for chemical resistance as described herein.

Place panel on a flat surface, clean with soap and water and blot dry. Condition the panel for 48-hours at 73º +/- 3ºF (23º +/- 2ºC) and 50 +/- 5% relative humidity or the currently accepted guideline set by ASTM. Test the panel for chemical resistance using forty-nine different chemical reagents by one of the following methods.

Method A - Test volatile chemicals by placing a cotton ball saturated with reagent in the mouth of a 1-oz. (29.574cc) bottle and inverting the bottle on the surface of the panel.

Method B - Test non-volatile chemicals by placing five drops of the reagent on the surface of the panel and covering with a 24mm watch glass, concave side down.

For both of the above methods, leave the reagents on the panel for a period of one hour. Wash off the panel with water, clean with detergent and naptha, and rinse with deionized water. Dry with a towel and evaluate after 24-hours at 73º +/- 3ºF (23º +/- 2ºC) and 50 +/- 5% relative humidity, or the currently accepted guideline set by ASTM using the following rating system.

Level 0 - No detectable change.
Level 1 - Slight change in color or gloss.
Level 2 - Slight surface etching or severe staining.
Level 3 - Pitting, cratering, swelling, or erosion of coating. Obvious and significant deterioration.

8.1.3 Acceptance Level

Range of results is provided to establish the acceptable range for a Laboratory Grade Finish. Results will vary from manufacturer to manufacturer due to differences in finish formulations. Laboratory grade finishes shall result in no more than four (4) Level 3 conditions. Individual test results, for the specified 49 reagents, will be verified with the established third party, independent SEFA 8 test submittal form. Suitability for a given application is dependent upon the chemicals used in a given laboratory.

8.2 Hot Water Test

8.2.1 Purpose of Test

The purpose of this test is to insure the coating is resistant to hot water.

8.2.2 Test Procedure

Hot water (190°F to 205°F [88°C to 96°C]) shall be allowed to trickle (with a steady stream and at a rate of not less than 6 ounces [177.44cc] per minute) on the finished surface, which shall be set at an angle of 45°, for a period of five minutes.

8.2.3 Acceptance Level

After cooling and wiping dry, the finish shall show no visible effect from the hot water.

8.3 Impact Test

Not Applicable to Wood Casework.

8.4 Paint Adhesion on Steel

Not Applicable to Wood Casework.

8.5 Paint Hardness on Steel

Not Applicable to Wood Casework.

8.6 Dart Impact Test

Not Applicable to Wood Casework.
8.7 **Edge Delaminating Tests**  
Not Applicable to Wood Casework.

8.8 **Edge Impact Test**  
Not Applicable to Wood Casework.

8.9 **Wear Resistance (Abrasion) Test**  
Not Applicable to Wood Casework.

9.0 **Wall, Counter Mounted, and Tall Cabinets**

9.1 **Description of Test Unit**

Evaluation shall be conducted on a wall mounted cabinet with nominal dimensions as follows: 48" +/- 1" wide, 30" +/- 1" high, and 12" +/- 1" deep. The wall cabinet shall be manufactured to manufacturers' standard construction and practices. The wall cabinet shall be open wall cabinet and have two (2) shelves. Shelves shall be evaluated per Section 7.0 (Shelves). The unit and shelves shall be mounted in a manner recommended by the manufacturer. A visual examination shall be conducted to verify that the configuration and installation comply with these conditions. Discontinue evaluation if unit is not in compliance or if malfunction is noted.

9.2 **Load Test**

9.2.1 **Purpose of Test**

The wall mounted load test will demonstrate the strength of the back of the wall cabinet as well as the joinery of the cabinet when the unit is subjected to loads normally expected for laboratory furniture.

9.2.2 **Test Procedure**

Using sand or shot bags weighing 10 pounds (4.545 Kg) each, load cabinet bottom, each shelf, and top uniformly with 40 pounds (18.143 Kg) per square foot to a maximum of 200 pounds (90.718 Kg) each. Maximum load to any cabinet shall not exceed 600 pounds (272.155 Kg) (a maximum of 200 pounds [90.718 Kg] loaded to the bottom, the top and the two (2) shelves.

9.2.3 **Acceptance Level**

With weights in place, after a period of 24 hours, verify that there is no significant permanent deflection of cabinet top, cabinet back, cabinet bottom, or shelves. After weights are removed, the cabinet shall show no permanent damage to the cabinet, cabinet bottom, or shelves.

10.0 **Tables**

10.1 **Description of Test Unit**

The table for evaluation shall be a standing height, four legged, free standing table. The table shall be nominally 60" (1,524mm) long, 24" (609.6mm) deep, and 36" (914.4mm) high.
(see Figure 13). Leg and apron size and construction shall be to manufacturer's specification. The table is to be tested without stretchers or spreader. A top of 1" (25.4mm) thick 37 - 50 pcf medium density fiberboard shall be mounted on the table in a manner recommended by the manufacturer. The top dimensions will be such that it will overhang the cabinet perimeter by 1". Its weight shall be included in the test as live load. Tables can be represented by a very large range of styles and designs. These table systems can all be classified as one of three types of tables; Fixed, Free Standing and Mobile.

10.2 Table Static Load

10.2.1 Test Purpose of Test

This test will challenge the table components to loads that are normal for use in a laboratory.

**Total Weight: 600 pounds (272.2 kg)**

![Fig 11 Table Static Load Test Configuration](image)

10.2.2 Test Procedure

Load the table top by using solid steel bars (per Section 3.1), each weighing 50 pounds (22.679 Kg), stacked evenly and spaced per Figure 14. Load the table to the manufacturer's recommended live load*. These evenly distributed loads should be no less than 300 pounds (136.077 Kg) for mobile, 600 pounds (272.155 Kg) for free standing and 2000 pounds (907.184 Kg) for fixed. Include the weight of the working surface as live load.

*Table load will vary considerably. Factors impacting live load capability include the size of the table, material, amount of drawers and book compartments, glide or caster load rating. Contact manufacturer for live load specifications.

10.2.3 Acceptance Level

No structural breakage shall result from application of the load. With the full load, the apron rails shall not deflect more than 1/360 of the span of the table and not to exceed 1/8" (3.175mm). In the case of a table with a drawer, the deflection of the rail shall not interfere with the function of the drawer. After the load is removed, inspect the table for structural damage.

10.3 Table Racking

10.3.1 Purpose of Test

This test will demonstrate the structural integrity of the table construction when subjected to a racking load. Most racking failures occur upon dragging an unloaded table across a floor. The ability of a table to resist a racking load will indicate less damage to the structure. The following tests were based on and adapted from ANSI/BIFMA X5.5-1989 American National Standard for Office Furnishings "Desk Products-Tests." Adjustments have been made to better accommodate the specific applications of tables used in laboratories.

10.3.2 Test Procedure

The table shall have a common two-by-four wood rail clamped on the centerline of the top parallel to the ends of the table. The table shall then be positioned at 45°, with one pair of legs on the floor and the other raised and supported (see Figure 15). The table shall then have 250 pounds (113.398 Kg) of weight (five 50-pound (22.679 Kg) bars) placed on its top and held in place by the two-by-four wood rail. The unit shall remain in this position for seventy-two hours. The unit shall be lowered without shock to the leveled surface and the general operation of the drawers shall be evaluated.
10.3.3 Acceptance Level

When returned to normal position, the operation of the table shall be normal, and there will be no permanent damage.

Endnotes:

1 This format has been adapted from the BIFMA American National Standard format, X5.5 - 1989.

2 Ibid. p 8.


8 Webster’s Ninth New Collegiate Dictionary, 1988, p 980.
SEFA-Approved Product Testing Facilities

Testing as described in this document must be performed and documented by one of the following third-party testing facilities:

**Bjorksten bit 7**
Michael Maloney, President
2 fen Oak Court
Madison, WI 53718
Phone: 608.224.0377
Fax: 608.224.0455
Email: Bjorksten@bit7.net
www.bit7.com

**Cardinal Environmental Inc.,**
Scott A. Hanson, President
3303 Pain Avenue
Sheboygen, WI 53081
Phone: 920.459.2500
Fax: 920.459.2503
Email: shanson@cardinalenvironmental.com
www.cardinalenvironmental.com

**Exova**
Sandra Hood
2395 Speakman Drive
Mississauga, Ontario L5K 1B3
Phone: 905.822-4111 Ext 593
Email: sales@exova.com
www.exova.com

**Gaynes Labs, Inc.,**
Philip D. Ross, Products Materials Manager
9708 Industrial Drive
Bridgeview, IL 60455
Phone: 708.233.6655
Fax: 708.233.6985
Email: gayneslabs@aol.com
www.nrinc.com/gaynes

**IMR Test Labs**
Don Shuman
131 Woodsgedge Drive
Lansing Technology Park
Lansing, NY 14882
Phone: 607.533.7000
Fax: 607.533.9210
Email: imr@imrtest.com
www.imrtest.com

**Intertek ETL Entela**
Joe LaGrow, Account Consultant
3033 Madison SE
Grand Rapids, MI 49548
Phone: 616.247.0515
Fax: 616.247.7527
Email: joseph.lagrow@intertek.com
www.entela.com

**Micom Laboratories Inc.,**
Michel Comtois, Laboratory Services
556, Avenue Lepine
Dorval, QC CANADA H9P 2V6
Phone: 514.633.0078
Fax: 514.633.7188
Email: info@micomlab.com
www.micomlab.com

**SGS Testing Co.**
Oliva Kou or Steven Xi
1/F 3rd Building
No. 889, Yishan Road
Xuhui District, Shanghai, China 200233
Phone: 86.0.21 6140 2666 ext 2013 or 2710
www.cn.sgs.com
LABORATORY FURNITURE
CERTIFICATE OF PERFORMANCE

______________________________________________ certifies that its laboratory furniture identified as
(Company Name)
__________________________________________ , has been tested in conformance with the full requirements
(Test Unit)
of the SEFA 8-W-2010 Recommended Practices with results noted below.

Full documentation of the test results is available upon request in a bound report that includes a detailed description of the test unit and procedures, witnesses results and appropriate drawings or photographs of the test unit and procedures.

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COMPANY INFORMATION

Name:
Address:
Telephone:
Fax:

TEST SUPERVISOR INFORMATION

Name:
Title:
Signature:

COMPANY OFFICER INFORMATION

Name:
Title:
Date:
Signature:

### CHEMICAL RESISTANCE TESTING – 8-W-2010

**Date of Test:**

**Sample Description:**

**Type of Material Coated:**

**Coating Type:**

**Rating Scale:**

- Level 0 – No Detectable Change
- Level 1 – Slight Change in Color or Gloss
- Level 2 – Slight Surface Etching or Severe Staining

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<td>Sulfuric Acid 33%</td>
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<td></td>
</tr>
<tr>
<td>43</td>
<td>Sulfuric Acid 77%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Sulfuric Acid 96%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Sulfuric Acid 77%, and Nitric Acid 70%, equal parts</td>
<td></td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Toluene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Trichloroethylene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Xylene</td>
<td></td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Zinc Chloride, Saturated</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>