[SEFA RESULTS]

WHAT IS SEFA?

The Scientific Equipment and Furniture Association (SEFA) is a voluntary international trade association representing members of the laboratory furniture, casework, fume hood and related equipment industry. The Association was founded to promote this rapidly expanding industry and to improve the quality, safety and timely completion of laboratory facilities in accordance with customer requirements.

SEFA members work together to establish, monitor and modify, as needed, industry-wide recommended practices in the areas of fume hoods, laboratory work surfaces, equipment and furniture installations.

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 national 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 better understanding between designers, architects, manufacturers, purchasers, and end users to assist the purchaser in selecting and specifying the proper product to meet the user's particular needs.

SEFA 8 CERTIFICATE OF PERFORMANCE INDEPENDENT TEST LAB

Diversified Woodcrafts, Inc. contracted with Bjorksten Research Laboratory, 2 Fen Oak Court, Madison, WI 53718 to test our laboratory casework as it conforms to the SEFA 8 standards. The finish tests were performed by Chemcraft International, Inc., 1101 N. Bluemound Drive, Appleton, WI 54914. The summary results are shown below.

LABORATORY FURNITURE - SEFA 8

This recommended practice is intended to provide manufacturers, specifiers, and users tools for evaluating the safety, durability, and structural integrity of laboratory casework and complimentary items.

DESCRIPTION OF TEST CABINET

Diversified Woodcrafts, Inc. model number 108-4822, 48" wide x 22" deep combination base cabinet with one (full opening) drawer and two doors. Cabinet was leveled and the drawers, doors, hinges, latches, etc. were inspected and all were operating properly. The wall cabinet was Diversified Woodcrafts, Inc. model number D03-4812, 30" high x 48" wide x 12" deep with 2 doors and 2 movable shelves.

Test	Result	Test	Result
4.2	Pass	6.3	Pass
4.3	Pass	6.4	Pass
4.4	Pass	6.5	Pass
4.5	Pass	7.1	Pass
5.1	Pass	8.1	Pass
5.2	Pass	8.2	Pass
5.3	Pass	8.3	Pass
6.1	Pass	9.2	Pass
6.2	Pass		

[SEFA RESULTS]

DIVERSIFIED WOODCRAFTS, INC

CABINET LOAD TEST

4.2.1 Purpose of Test

The cabinet load test challenges the structural integrity and the load-bearing capability of the cabinet construction. The test demonstrates the ability of the cabinet to support heavy loads.

4.2.2 Test Procedure

The cabinet top was loaded using 2,000 pounds of solid steel bars stacked five high, in eight equally spaced rows. After 10 minutes, the bars were removed from the cabinet.

4.2.3 Acceptance Level

There are no signs of permanent damage.

CABINET CONCENTRATED LOAD TEST

4.3.1 Purpose of Test

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

4.3.2 Test Procedure

Four, 50 pound solid steel bars were placed on top of the cabinet, along the cabinet centerline. With the weight in place, the drawers and doors were operated and inspected.

4.3.3 Acceptance Level

Doors and drawers operated normally. There is no permanent distortion to the front rail, cabinet joinery, doors, or drawers.

CABINET TORSION

4.4.1 Purpose of Test

The test evaluates the structural integrity of the cabinet construction when subjected to torsional load.

4.4.2 Test Procedure

The cabinet was supported on three, 3-1/4" x 3-1/2" x 4"H hardwood blocks, located under the two rear corners and one front corner. The cabinet was secured, diagonally from the unsupported corner with seven, 50 pound, solid steel bars to prevent overturning. Four, 50 pound, solid steel bares were placed on the unsupported corner of the cabinet and left in position for 15 minutes. The weights were then removed and the cabinet was placed on the floor in its normal, upright, position. The cabinet joinery was inspected and the cabinet was leveled and measured, diagonally, between the corners of the face and the back of the cabinet.

4.4.3 Acceptance Level

When returned to normal position, the operation of the cabinet was normal and there was no evidence of permanent damage. The difference between the diagonal measurements does not exceed 1/8" front or back.

[SEFA RESULTS]

DIVERSIFIED WOODCRAFTS, INC

CABINET SUBMERSION TEST

4.5.1 Purpose of Test

The test demonstrated the ability of a cabinet to resist standing water.

4.5.2 Test Procedure

The thickness of the material along the perimeter of the bottom of the cabinet was measured on 6" increments. The thickness was recorded and the arithmetic mean was calculated. The cabinet was then placed in a pan of water so that the bottom 2" of the cabinet was submerged. The cabinet remained in the water for 4 hours and then it was removed and immediately re-measured at the same locations that were measured initially. The thickness at each location was recorded and the arithmetic mean was calculated. After the cabinet had dried, it was inspected for damage.

4.5.3 Acceptance Level

The cabinet shows no signs of permanent deformation or deterioration and the average increase in thickness is less than four percent (3.5%).

DOOR HINGE TEST

5.1.1 Purpose of Test

The test demonstrates the durability of the door and its hardware to an applied load of 200 pounds.

5.1.2 Test Procedure

The shelf was removed and weight was placed on top of the cabinet to prevent it from overturning. A cabinet door was opened 90˚ and a sling with four 50 pound weights was hung over the top of the door, at a point out from the hinge centerline. The door was then slowly moved through the full cycle of the hinge (up to a 160˚ arc). The weight was then removed, the door was swung through its full intended range of motion, and closed.

5.1.3 Acceptance Level

There was no significant permanent distortion and the door operated normally after the weight was removed.

DOOR IMPACT TEST

5.2.1 Purpose of Test

The test demonstrates the resistance to a 240 inch-pound impact to the door face.

5.2.2 Test Procedure

Eight, 50 pound solid steel bars were placed on top of the cabinet to prevent overturning. A 20 pound sand bag was then suspended from a pendulum support and dropped providing an impact of 240 inch-pound at the center of a closed door.

5.2.3 Acceptance Level

Door and catch operated normally and show no signs of permanent damage.

[SEFA RESULTS]

DIVERSIFIED WOODCRAFTS, INC

DOOR CYCLE TEST

5.3.1 Purpose of Test

The test demonstrates the ability of the door hinge hardware to withstand 100,000 cycles as a reliable measure of longevity.

5.3.2 Test Procedure

A cycling mechanism, that swings a door through an arc of 90˚, was operated for 100,000 cycles.

5.3.3 Acceptance Level

The door operated for the full 100,000 cycles without deterioration that significantly affected the function of the door. After completion of the test, the door operates freely and without binding.

DRAWER STATIC LOAD TEST

6.1.1 Purpose of Test

The test demonstrates the ability to support a point load given to the front of the drawer and will challenge the attachment of the drawer head to the drawer.

6.1.2 Test Procedure

Eight, 50 pound solid steel bars were placed on to of the cabinet to prevent overturning. A drawer was opened to 13" of travel and 150 pounds was hung from the drawer head, at the centerline of the drawer, for 5 minutes. The weight was then removed and the drawer was operated through the full cycle.

6.1.3 Acceptance Level

There was no interference with the normal operation of the drawer.

DRAWER & DOOR PULL TEST

6.2.1 Purpose of Test

The test evaluates the strength of the pull and the pull hardware.

6.2.2 Test Procedure

The pulls were installed in accordance with Diversified Woodcrafts practice using specified attaching hardware and method. A drawer and a door were blocked closed and a cable, pulley, and weight assembly was used to apply a force of 50 pounds perpendicular to each pull. Similar set-up was then used to hang a 50 pound weight from each pull.

6.2.3 Acceptance Level

Pulls resisted the force and supported the weight and there is no evidence of permanent distortion..

[SEFA RESULTS]

DIVERSIFIED WOODCRAFTS, INC

DRAWER IMPACT TEST

6.3.1 Purpose of Test

The test demonstrates the resistance to impact of the drawer bottom and the slide mechanism.

6.3.2 Test Procedure

A drawer was opened to 13" of travel and then a 10 pound sand bag was dropped, from a height of 24", into the bottom of the drawer, at the centerline of the width of the drawer and 6" back from the inside face of the drawer.

6.3.3 Acceptance Level

The drawer was operated through a full cycle and it operated normally. There was no visible deformation of the drawer.

DRAWER INTERNAL ROLLING IMPACT

6.4.1 Purpose of Test

The test evaluates 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

The drawer was positioned on a table at a 45˚ angle and a 2" diameter by 12" long steel rod, that weighs approximately 10 pounds, was positioned 13" from the target impact area such that the rod rolled freely to impact the back of the drawer. The back was subjected to three impacts and then the drawer was reversed and the front was subject to three additional impacts.

6.4.3 Acceptance Level

There are no visible signs of permanent damage. All joinery is intact and the drawer operated normally when returned to the unit.

DRAWER CYCLE TEST

6.5.1 Purpose of Test

The test is intended to replicate years of operation of a drawer under full load.

6.5.2 Test Procedure

A static load of 100 pounds (using ten 10 pound sand bags) was uniformly distributed in a drawer and the force required to activate the drawer was measured. The drawer was then opened from a closed position to a position within 1/4" of full extension and then closed. The procedure was repeated 50,000 times at a rate that did not exceed 10 cycles per minute.

6.5.3 Acceptance Level

After the 50,000 cycles were completed, the drawer operated freely with no evidence of dragging, rubbing, or binding. The force required to open and close the loaded drawer increased by 7.1% which is less than the allowable maximum (20%). The force required to open and close the loaded drawer was less than 8 pounds.

[SEFA RESULTS]

DIVERSIFIED WOODCRAFTS, INC

SHELVING

7.1.1 Purpose of Test

The test demonstrates the ability of a shelf and mounting hardware to support normal laboratory loads.

7.1.2 Test Procedure

The shelf was mounted in the manner in which it was designed and a dial indicator was positioned under the center of the shelf and adjusted to zero. Thirteen 10 pound sand bags were uniformly distributed on the shelf to obtain a loading of 40 pounds per square foot of shelf area and the deflection was recorded. The weight was then removed from the shelf.

7.1.3 Acceptance Level

The deflection of the shelf under load - 0.245” which is less than the allowable maximum of 0.25." There was no significant permanent distortion of the shelf.

WALL CABINET LOADING TEST

8.1.1 Purpose of Test

The test demonstrates the strength of the back of the wall cabinet as well as the joinery of the cabinet and function of the doors when the unit is subjected to loads normally expected for laboratory furniture.

8.1.2 Test Procedure

130 pounds of sand bags, 40 pounds per square foot, were used to load the cabinet bottom, the cabinet top and shelves. With the weight in place the doors were operated through their full travel to verify normal operation. The weight was then removed and the doors were again operated through their full travelto verify normal operation.

8.1.3 Acceptance Level

Doors opened and closed normally with and without the weight in place. There is no significant permanent deflection or damage to cabinet, cabinet back, cabinet top, cabinet bottom or shelf.

[SEFA RESULTS]

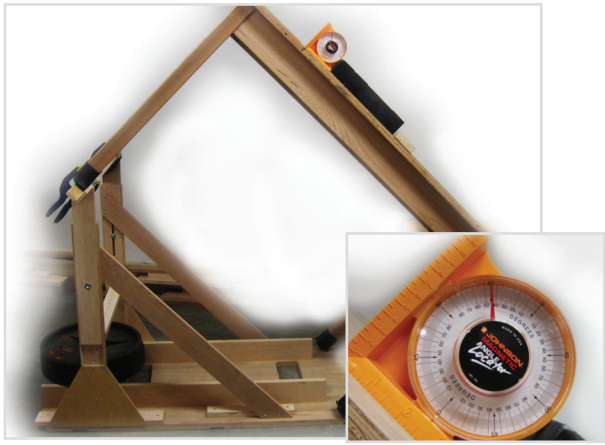


TABLE TEST

9.1.1 Purpose of Test

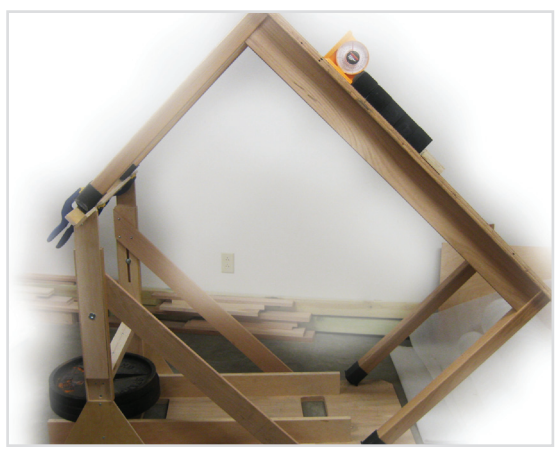
This test will demonstrate the structural integrity of the table construction when subjected to a racking load. Most racking failures occur upon dragging an unloaded table across a floor. The ability of a table to resist a racking load will indicate less damage to the structure. The following tests were 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.

9.1.2 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 14). 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.

9.1.3 Acceptance Level

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



[SEFA RESULTS]

REAGENTS	PASS/FAIL
Acetate Amyl**	Pass
Acetate Ethyl**	Pass
Acetic Acid 98%	Pass
Acetone**	Pass
Acid Dichromate 5%	Pass
Alcohol Butyl**	Pass
Alcohol Ethyl**	Pass
Alcohol Methyl**	Pass
Ammonium Hydroxide 28%	Pass
Benzene**	Pass
Carbon Tetrachloride**	Pass
Chloroform**	Pass
Chromic Acid 60%	Pass
Cresol**	Pass
Dichloro Acetic Acid**	Fail
Dimethylformanide**	Pass
Dioxane**	Pass
Ethyl Ether**	Pass
Formaldehyde 37%**	Pass
Formic Acid 90%	Pass
Furfural**	Pass
Gasoline**	Pass
Hydrochloric Acid 37%	Pass
Hydrofluoric Acit 48%	Pass
Hydrogen Peroxide 3%	Pass
Iodine	Pass
Methyl Ethyl Ketone**	Pass
Methylene Chloride**	Pass
Mono Chlorobenzene**	Pass
Naphthalene**	Pass
Nitric Acid 20%	Pass
Nitric Acid 30%	Pass
Nitric Acid 70%	Pass
Phenol 90%**	Fail
Phosphoric Acid 85%	Pass
Silver Nitrate	Pass
Sodium Hydroxide 10%	Pass
Sodium Hydroxide 20%	Pass
Sodium Hydroxide 40%	Pass
Sodium Hydroxide Flake	Pass
Sodium Sulfide, saturated	Pass
Sulfuric Acid 33%	Pass
Sulfuric Acid 77%	Pass
Sulfuric Acid 96%	Fail
Sulfuric Acid 77% & Nitric Acid 70%	Pass
Toluene**	Pass
Trichloroethylene**	Pass
Xylene**	Pass
Zinc Chloride Saturated	Pass

** Indicates Test Method A

FINISH TEST

10.1.1 Purpose of Test

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

10.1.2 Test Procedure

The received sample measuring 14" x 24" was tested for chemical resistance as described herein. The panel was placed on a flat surface, cleaned with soap and water, then blotted dry. The panel was conditioned for 48 hours at 73+3˚F and 50+ 5% relative humidity. The panel was then tested for chemical resistance using forty-nine different chemical reagents by one of the following methods.

Method A - Volatile chemicals were tested by placing a cotton ball saturated with reagent in the mouth of a 1-oz. bottle an inverting the bottle on the surface of the panel.

Method B - Non-volatile chemicals were tested by placing five drops of the reagent on the surface of the panel and covering with a 24mm watch glass, convex side down. For both methods, the reagents were left on the panel for a period of one hour, then washed off with water, cleaned with detergent and naptha, and rinsed with deionized water. The panel was then dried with a towel and evaluated after 24-hours at 73± 3˚F and 50 ± 5% relative humidity.

10.1.3 Acceptance Level

Chemical test exceeded the requirements of no more than four of 49 chemicals tested failed with a fail rate of three. Results shown on the left.

HOT WATER TEST

10.2.1 Purpose of Test

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

10.2.2 Test Procedure

Hot water (190˚F. to 205˚F) was allowed to trickle with a steady stream and at a rate of not less than 6 ounces/minute on the finished surface, which was set at an angle of 45˚, for a period of five minutes.

10.3.3 Acceptance Level

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

IMPACT TEST

10.3.1 Purpose of Test

The purpose of this test is to evaluate the ductility of the coating.

10.3.2 Test Procedure

A one-pound ball approximately 2” in diameter was dropped from a distance of 12” onto the flat horizontal surface, which was coated to DWI standard manufacturing method.

10.3.3 Acceptance Level

There is no visual evidence to the naked eye of cracks or checks in the finish due to impact.