

May 2, 2011

## **SEFA-8-M-2007 TESTS**

Performed For:

**Jamestown Metal Products  
178 Blackstone Avenue  
Jamestown, NY 14701**

### **4.0 Base Cabinets**

#### **4.1 Description of Test Cabinet:**

Part No. **P105-48FX** (48" wide, X 35" tall X 21-3/4" Deep) Base Cabinet was leveled and the drawers, doors, hinges, latches, etc. were inspected and all were operating properly.

#### **4.2 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, but is not intended to test the functional characteristics of the cabinet under heavy loads.

##### **4.2.2 Test Procedure**

The cabinet top was loaded using 2,000 pounds (907.2 Kg) of solid steel bars\* stacked five high, in eight equally spaced rows (Figure 1). After 10 minutes, the bars were removed from the cabinet.  
\* Square solid steel bar, 2-1/2" X 2-1/2" X 28-1/4" (63.5 mm X 63.5 mm x 717.55 mm) weighing 50 lbs. (22.68 Kg).

##### **4.2.3 Acceptance Level**

**There are no signs of permanent damage.**



**Figure 1**

## 4.3 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 (22.68 Kg) solid steel bars (200 pounds, 90.7 Kg total) were placed on top of the cabinet, along the cabinet centerline (Figure 2). With the weight in place, the drawers and doors were operated and inspected.



Figure 2

### 4.3.3 Acceptance Level

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

## 4.4 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, 3-1/2" X 3-1/2" X 4" high (88.9 mm X 88.9 mm X 101.6 mm) hardwood blocks, located under the two rear corners and one front corner (not more than 6" (152.4 mm) in from each support corner). The cabinet was secured, diagonally, from the unsupported corner with seven, 50 pound (22.68 Kg), solid steel bars (to prevent overturning). Four, 50 pound (22.68 Kg), solid steel bars (200 pounds, 90.7 Kg total) were placed on the unsupported corner of the cabinet and left in position for 15 minutes (Figure 3). 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 (Table 1).



Figure 3

**Table 1**  
**Diagonal Measurements of Cabinet**

Location	#1	#2	Difference
Front	57	57	0
"	57	57	0
Back	59-1/2	59-1/2	0
"	59-1/2	59-1/2	0

#### 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" (3.175 mm) front or back.

## 5.0 Doors

### 5.1 Door Hinge Test

#### 5.1.1 Purpose of Test

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

#### 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 (22.68 Kg) weights (200 pounds, 90.72 Kg total) was hung over the top of the door, at a point 12" (394.8 mm) out from the hinge centerline. The door was then slowly moved through the full cycle of the hinge (up to a 160° arc) (Figure 4). The weight was then removed, the door was swung through its full intended range of motion, and closed. The procedure was then repeated on the other door.



**Figure 4**

#### 5.1.3 Acceptance Level.

There was no significant permanent distortion and the doors operated normally and latched properly after the weight was removed.

## 5.2 Door Impact Test

### 5.2.1 Purpose of Test

The test demonstrates the resistance to a 240 inch-pound (27.1 N-m) impact to the door face.

### 5.2.2 Test Procedure

Six, 50 pound (22.68 Kg) solid steel bars (400 Pounds, 181.44 Kg total) were placed on top of the cabinet (to prevent overturning). A 20 pound (9.07 Kg) sand bag was then suspended (from a pendulum support) and dropped providing an impact of 240 inch-pounds (27.1 N-m) at the center of a closed door (Figure 5).



Figure 5

### 5.3 Acceptance Level

**Door and catch operate normally and show no sign of permanent damage.**

## 5.3 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 (at a speed of less than 15 cycles per minute) (Figure 6).  
\* The test was performed in conformance with ANSI test procedure A156.9, Grade 1, requirements for cycle testing of doors.



Figure 6

### 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.**

## 6.0 Drawers

### 6.1 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 drawer suspension system and the attachment of the drawer head to the drawer.

#### 6.1.2 Test Procedure

Eight, 50 pound (22.68 Kg) solid steel bars (400 Pounds, 181.6 Kg total) were placed on top of the cabinet (to prevent over-turning). A drawer was opened to 13" (330.2 mm) of travel and 150 pounds (68.04 Kg) was hung from the drawer head, at the centerline of the drawer, for 5 minutes (Figure 7). The weight was then removed and the drawer was operated through the full cycle.



Figure 7

#### 6.1.3 Acceptance Level

There was no interference with the normal operation of the drawer and the drawer head remained tightly fastened to the drawer.

### 6.2 Drawer and 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 the manufacturers practice using specified attaching hardware and method. A drawer and a door were blocked closed and a force gauge was used to apply a force of 50 pounds (22.68 Kg) perpendicular to each pull for 15 seconds (Figure 8 and 9). A force gauge was then used to apply a 50 pound (22.68 Kg) downward force to each pull for 15 seconds (Figures 10, and 11).



Figure 8



**Figure 9**



**Figure 10**



**Figure 11**

### **6.2.3 Acceptance Level**

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

## **6.3 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" (330.2 mm) of travel and then a 10 pound (4.54 Kg) sand bag was dropped, from a height of 24" (609.6 mm), into the bottom of the drawer, at the centerline of the width of the drawer and 6" (152.4 mm) back from the inside face of the drawer (Figure 12).



**Figure 12**

### **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.**

## 6.4 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" (50.8 mm) diameter by 12" (304.8 mm) long steel rod, that weighs approximately 10 pounds (4.54 Kg), was positioned 13" (330.2 mm) 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 (Figure 13).



Figure 13

### 6.4.3 Acceptance Level

**There are no visible signs of permanent damage. The drawer operated normally when returned to the unit.**

## 6.5 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

#### **Laboratory Load (100 pounds, 45.36Kg)**

A static load of 100 pounds (45.6 Kg) (using ten 10 pound (4.54 Kg) sand bags) was uniformly distributed in a drawer and the force required to activate the drawer was measured (Table 2). The drawer was then opened from a closed position to a position within 1/4" (6.35 mm) of full extension and then closed. The procedure was repeated 50,000 times at a rate that did not exceed 10 cycles per minute (Figure 14).



Figure 14

Table 2

Load in Drawer (lbs)	Initial Force (lbs)	Final Force (lbs)	% change
100	4.5	2.0	44

### 6.5.3 Acceptance Level

The required 50,000 cycles were completed and the initial and final forces are recorded in Table 2. The force to open and close less than the 8 pound acceptance level, therefore the drawer slides pass.

## 9.0 Shelving

### 9.1.1 Purpose of Test

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

### 9.1.2 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. Twenty 10 pound (4.54 Kg) sand bags (200 pounds, 90.72 Kg total) were uniformly distributed on the shelf and the deflection was recorded (Figure 15). The weight was then removed from the shelf.



Figure 15

### 9.1.3 Acceptance Level

The deflection of the shelf under load = 0.118" (3 mm) which is less than the allowable maximum of 0.25" (6.35 mm). There was no significant permanent distortion of the shelf.

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