

**MULTI-LAB  
LABORATORY FURNITURE**

**STANDARD STEEL CONSTRUCTION**

**SECTION I**

1. GENERAL

1a. All laboratory furniture shall represent the combined result of the foremost engineering practice and skilled craftsmanship. All parts shall be die-formed to insure uniformity and interchangeability.

1b. When assembled, each cabinet shall be a complete and integral unit that will fit harmoniously into an assembly of cabinets and tables and will permit relocation within the assembly at any subsequent time. In such assemblies, the units shall be joined together with concealed fasteners.

1c. All steel used in the manufacture of laboratory furniture shall be cold rolled steel, prime grade, leveled and resquared and free from deep scratches, etching, ragged edges or other injurious imperfections. Lead-coated steel shall not be acceptable due to the high corrosion potential that exists at cuts, welds and bends.

1d. Stainless steel, where indicated, and unless otherwise specified, shall be type 304 and contain 8% nickel and 18% chromium. All exposed surfaces shall be finished with a #4 satin finish.

1e. All cabinet units shall be of single-wall type construction with drawer and double construction with all parts made of the thickness steel listed below:

Gauges of Steel - U.S. Standard

Leveling gusset . . . . .	12 Ga.
Drawer runner and cabinet runner . . . . .	14 Ga.
Sink supports, front frame assembly, toe kick . . . . .	16 Ga.
Sides panels. . . . .	18 Ga.
Drawer fronts, backs, doors, shelves, cupboard bottoms and drawer body. . . . .	20 Ga.

2. Base Cabinet Construction

2a. All joints shall be notched, keyed and fitted together to form an interlocking joint construction to develop maximum rigidity and load bearing strength before welding. Sub - assemblies shall be spot or mig welded.

2b. Cabinet units shall have drawers, cupboards or a combination thereof as indicated. Standard cabinet units shall be constructed so that, after installations, a quick and easy change can be made from drawers to doors or vice versa, or a substitution can be made of two shallow height drawers to replace a standard height drawer with the use of common tools.

2c. Sides shall be die-formed with deep channel shaped corner posts at the front and flanged at the rear for the reception of drawer runner attaching loops. The top and bottom of the side panel shall have channel return flanges. Exposed fascia of corner posts shall be no less than 1-1/4" wide.

2d. An exposed intermediate rail shall be welded between the top standard height drawer and door.

## MULTI-LAB LABORATORY FURNITURE

2e. Cupboard bottoms shall be formed up on ends and back and have a form down on front for added rigidity. They shall be removable to facilitate cleaning of accidental spillage's. Welded in bottoms will not be acceptable. Bottoms shall have a  $\frac{3}{4}$ " hole in each corner for access to leveling devices. Access holes to the leveling bolts in the bottom of the unit shall contain a removable snap on covers.

2f. The 4" high x 3" deep toe space shall be integral with the front frame of the cabinet and formed of one piece 16 gauge.

2g. Die-formed gusset plates shall be provided for each lower corner of the unit. To develop maximum strength at the corner, they shall be welded to the sides and the horizontal members of the unit and designed so the load is borne by the gussets and not by the weld. The leveling gussets shall have threaded holes for leveling bolts. Leveling bolts shall be slotted for easy adjustment with a screwdriver.

2h. Removable backs shall be flanged at top. Backs shall be held in place by die-formed metal tabs on the bottom. They shall be removable without use of tools.

2i. All base cabinets and table legs shall be furnished with leveling devices.

2j. Cupboard doors shall be double wall construction and shall be hung on a pair institutional type hinges. Door pans shall contain sound deadening material. Hinges shall be institutional, five-knuckle type. Barrels shall be 2- $\frac{1}{2}$ " long. Mounting leaf for the door shall have three countersunk holes for screw mounting. All doors shall be held in closed position by use of nylon spring-load roller catch.

2k. All cupboards shall be separated from tiers of vertical drawers by a steel partition.

2l. Drawers shall be of front double wall construction  $\frac{3}{4}$ " thick. Drawer body shall be one piece construction 20 gauge with rounded top edges on sides open returned on a  $\frac{5}{16}$ " diameter. Drawer fronts shall be removable and snap over drawer liner. Two "Z" shaped drawer runners shall be welded to each side of the drawer body to provide rigidity, strength and a means of suspension. Formed into this member shall be automatic positive stops which shall strike a rubber cushioned stop on the cabinet runner. This stop must be positive, allowing no means of jumping yet shall provide easy removal of the drawer when desired. Drawers shall operate on 1- $\frac{1}{8}$ " diameter nylon ball-bearing rollers which shall be readily removable for maintenance. The fixed companion cabinet channels shall be designed to interlock with the drawer channels to form extension tracks for the rollers and to provide a positive, accurately aligned suspension for the drawer, and shall form a mating drawer top to provide a positive stop for the drawers. All drawers shall close against rubber bumpers.

Drawer and cupboard doors shall close against rubber bumpers and close flush with rails. Cupboards doors shall close against channel formed vertical door strikes with rubber bumper.

2m. Cupboards are furnished with full depth removable shelf. Shelves shall be supported by removable shelf clips which snap into shelf standards welded to side panels. They will be adjustable on  $\frac{1}{2}$ " centers. Shelves shall be of 20 gauge steel with  $\frac{3}{4}$ " forms on front and rear and  $\frac{3}{4}$ " forms on sides. Front shall be U-formed. Rear edge shall project to prevent inadvertent slipping over shelf supports. Full length 20 gauge, U-shaped reinforcement shall be welded to shelves over 24" long.

# MULTI-LAB LABORATORY FURNITURE

## 3. Legs, Aprons and Drawer Sections

3a. Aprons shall be formed in a box channel shape of 16 gauge steel. Each corner is securely welded together by means of a 18 gauge corner angle, 16 gauge corner gusset and an 16 gauge corner bracket giving maximum strength and rigidity. Aprons containing drawers to have 16 gauge top and bottom rails with drawer case channels welded in place. Drawers to be of same construction and gauges as specified under cabinet units.

3b. The legs of open frame tables shall be 16 gauge, 2" square, welded tubing. The legs are inserted inside apron through notches provided and secured to leg bracket with ¼" - 20 x 1" bolt. A leveling device and shoe shall be furnished at the bottom of each leg. Legs assemblies shall be square tube end stretcher. An 16 gauge, 2" x 2" square channel foot rest may be added to any table for extra rigidity when called for in specifications or shown on drawings.

## 4. Storage Cabinets and Wall Cases

4a. Storage cabinets and wall cases shall be of the style and size shown and shall be constructed 20 gauge steel throughout. Joints shall be mechanically interlocked with overlapping areas spot welded. Interior of cases shall have all vertical and horizontal edges and corners enclosed with no recesses to allow accumulation of dust. Perforations in cases for support and adjustment of shelves which might allow entry of vermin will not be acceptable. Shelf standards shall be attached to the interiors of cases providing the adjustment of shelves of 1/2" spacing. Cabinets extending to the floor shall have reinforcing gusset plate with a leveling device in each corner.

4b. Wall cases shall have a double bottom. The exposed bottoms of wall hung cases shall be flush single piece construction. Interior bottoms of all cases shall be easily removable and replaceable.

4c. All interior members of doors shall be not less than 20 gauge. All exposed corners of the glass openings shall have a ¾" radius. 20 gauge glass retaining strips shall be fastened to the frame to hold the molded U-shaped rubber channel in which glass is set. Sliding doors shall have nylon upper glides and shall operate on lower nylon sheaves rolling on a track, resulting in noiseless easy operation of doors. Doors shall be easily removable when unlocked.

4d. Sliding glazed doors for wall hung cases shall be flush single piece construction. Sliding glazed doors for wall hung cases shall be of ¼" double strength glass. All edges shall be protected against chipping and reinforced with anodized aluminum tracks. The lower tracks on which the rollers operate shall protrude vertically rather than to be formed into a depressed channel, thus preventing accumulation of dust and vermin.

4g. Hinged doors shall be hung 2-½" high five knuckle hinges with concealed leaves. Doors over four feet high shall be hung on three hinges.

## MULTI-LAB LABORATORY FURNITURE

### 5. Hardware

5a. Pulls: Shall be of solid cast aluminum bar pulls as standard. Flush pulls are optional.

5b. Label Holders: Shall be solid cast aluminum in satin finish and of streamline design will be provided as specified.

5c. Hinges: Shall be stainless steel of institutional type, with leaves not less than .095 inches thick. They shall have five knuckles of equal width with pins of not less than .187 inches in diameter. Two hinges shall be provided on doors under 36" in height and three hinges for doors 48" and over in height. Finish shall be satin finish or satin bronze as required.

5d. Door Catch: Shall be spring release type with nylon roller catch, adjustable for varying door release pressure and engaging on integral form of cabinet.

5e. Cadmium Plating: Shall be required on all door catches, elbow catches, up and down bolts, drawer case channels, extension arms, shelf clips, roller bearing sheaves, and on all mild steel screws.

5f. Elbow Catches: Shall be of barrel type and mounted on left hand door where right hand door has lock.

5g. Leg Shoes: Shall be molded black vinyl and shall have a coved bottom to match radius of base molding. Shoe shall fit snugly over outside of leg and have a black finish.

5h. Base Molding: Shall be black vinyl with upper edge rounded and bottom edge having a concave curve to floor. It shall be applied in strips with waterproof cement after cabinet installation.

5i. Shelf Standards: For shelf adjustment shall be of approved type with provision for easy adjustment on 1/2" centers for all cupboards. Shelf clips shall be removable.

5j. Plated Sheaves: Of heavy duty type with nylon roller shall be supplied for operation of all sliding doors. Nylon roller to roll on aluminum bottom track. Nylon upper top guides to fit over top of sliding doors.

### 6. Acid Resistant Finish

All finishing material shall be of highest laboratory quality obtainable such that the resulting surfaces shall be uniform in color, gloss and chemical resistance. Resulting final finish shall be free of dirt and foreign matter. All surfaces shall be painted or plated, whether they are exposed or not. The powder coat paint which is a baked-on and chemically resistant follows these general specifications.

The finish shall meet or exceed class one requirements and shall resist the action of the following reagents applied as a one c.c. puddle of each reagent to the surface for a period of one hour.

# MULTI-LAB LABORATORY FURNITURE

<u>Property</u>	<u>Test Methods</u>	<u>Value</u>
Adhesion and Flexibility: The powders which are used are flexible, allowing for normal expansion of metal. Tubing and sheet metal may be formed after coating without film rupture.		
ADHESION:		
Shear	1/2 Sq. in./overlap 200F	3000 p.s.i.
Tension	Dynamometer	3000 p.s.i.
FLEXIBILITY:		
Radius bend of sheet	ASTM-D-522	1/4" passes
Radius bend of tube	ASTM-D-522	1/4" passes
IMPACT RESISTANCE:		
	Gardner Impact Tester	Direct 160 inch-l.b. Reverse 160 inch-l.b.
FILM THICKNESS:	1.04 to 7.40 mil	
SALT SPRAY:	ASTM-B-117-61	No effect 5000
hours		
FLAME RESISTANCE:	MIL-1-16923C	Self
extinguishing		
FUNGUS RESISTANCE:	MIL-E-5272C	Does not support
fungus growth		
CHEMICAL RESISTANCE: No effect from most chemicals.		
Hydrochloric Acid 37%	Silver Nitrate (Sat. Sol.)	
Sulfuric Acid 33%	Methyl Alcohol (abs.)	
Sulfuric Acid 77%	Ethyl Alcohol 95%	
Formic Acid 90%	Butyl Alcohol	
Nitric Acid 20%	Benzene	
Nitric Acid 30%	Zylene	
Nitric Acid 70%	Toluene	
Phosphoric Acid 85%	Gasoline	
Chromic Acid 60%	Ethyl Acetate	
Acetic Acid 98%	Acetone	
Ammonium Hydroxide 28%	Chloroform	
Sodium Hydroxide 10%	Carbon Tetrachloride	
Sodium Hydroxide 20%	Phenol	
Sodium Hydroxide 40%	Formaldehyde	
Sodium Hydroxide Flake	Trichlorethylene	
Sodium Sulfide (Sat. sol.)	Ethyl Ether	
Zinc Chloride (Sat. Sol.)	Furfural	
Tinc. of Iodine (Sat. Sol.)	Mono Chlor Benzene	