

SECTION 12345 – LABORATORY METAL CASEWORK
and SECTION 12 3653 - Laboratory Work Surfaces

Part 1 - General

1.1 SCOPE

- A. The casework contractor, supplier shall furnish all material in accordance with this specification and applicable drawings. Installation equipment, tools, labor and insurance required to perform a complete installation will be provided by independent installer or in-house personnel of the end user.

1.2 WORK BY OTHERS

- A. Furnish, deliver and install all electrical work, conduit, wiring, mechanical service piping, shut off valves, drain lines, vents, special piping to meet local codes.
- B. Receive, store, distribute, install and connect all electrical service fixtures, plumbing service fixtures, drain fittings, traps, cup sinks and sinks supplied by the casework contractor. All framing, bucks, plaster grounds and reinforcement of walls, floors, and ceilings to support the casework.

1.3 MANUFACTURES

- A. All laboratory casework covered by this specification shall be the product of one manufacturer. Manufacturers furnishing equipment shall have been engaged in work of this type, for at least five years and shall have completed five installations of equivalent size. The metal casework under the fume hoods shall be supplied by the fume hood manufacturer to assure paint match. All casework must pass SEFA 8 testing requirements.
- B. Approved laboratory casework manufacturers are:

1. Basis of Supply or Fabrication: Total Laboratory Solutions
www.Duratop-Epoxy.com
Ph: 480.488.6421
Email: David@DuratopEpoxy.com

Basis of Design - Dura-line Steel Casework

2. Approved Substitutions

1.4 SAMPLES

- A. All bidders, upon request, shall be required to submit a sample of steel casework material duly epoxy powder coated. Samples shall be delivered, at no cost to the architect or owner, to a destination set forth by the architect, seven day prior to bid date as a condition of approval of each bidder.

Samples may be held by the owner or architect to insure that all equipment delivered conforms in every respect to the sample.

1.5 DRAWINGS

- A. The casework contractor shall furnish one set of drawings for approval upon receipt of notice of award, describing and/or illustrating all equipment covered by this contract. Fabrication must not be started until prints with the architects "Final Approval" stamp affixed thereon, have been returned to the manufacturer.

1.6 GUARANTEE

- A. The casework contractor shall guarantee all materials and workmanship of equipment provided under this contract for a period of one year from date of shipment. Any defects due to the use of improper materials or workmanship, occurring within that time shall be promptly rectified by this contractor at his own expense upon notification by the owner or architect of this condition.

Part 2 - Metal Casework Construction

2.1 MATERIALS

- A. All materials shall be of the highest quality, whether they be finished parts used in assembly, raw material, or materials and workmanship furnished by others, as part of the completed product.
- B. All steel used in the manufacture of metal casework shall be cold rolled, prime grade, or better. Steel shall be inspected prior to fabrication and certified to be free of rust, pits, scratches, or any other defects(s) which prevent parts from being made to blueprint specifications.

2.2 GAUGES OF MATERIALS

Aprons -	18 Ga
Back Panels -	20 Ga.
Bottom Panels -	18 Ga.
Door & Drawer Outer Pan -	20 Ga
Door & Drawer Inner Pan -	20 Ga
Drawer Bodies -	20 Ga.
Legs, 2" Square Tube -	16 Ga.
Shelves -	18 Ga.
Side Panels -	18 Ga.
Table Frames -	18 Ga
Shelf Support Brackets -	12 Ga.

2.3 CONSTRUCTION

A. Cabinets:

Cabinets shall be constructed of prime 18 gauge steel for the sides, backs, and toe space. 1" X 16 gauge steel tubing shall be used for the top front and back rails. Each front joint is to be welded and ground flush to provide a smooth surface. A 4' high X 3' deep toe space shall be standard. Four corners are to be fitted with a stamped and welded 12 gauge leveling gusset plate, and a plated leveling screw. Leveling screws are provided with a slot for easy adjustment, and non marking nylon glides. Removable back panels shall be furnished on all cabinets.

B. Doors - Base Cabinet Doors:

Doors shall be double pan construction, with insulating material fastened to the inside for sound deadening, and strength, to prevent panning and bending. Hinges are five knuckle gauge stainless steel, fastened to both the door and cabinet frame with zinc plated steel screws. Door catches plated, friction roller type. Door closes onto neoprene bumpers for noise dampening.

C. Drawers:

Drawer bodies shall be one piece 20 gauge construction, fully coved on all four sides horizontally and formed out of one sheet of steel.

D. Drawer Suspension:

Drawers shall operate on full extension, ball bearing, zinc plated, drawer suspension rated to withstand 10,000 cycles at 100 lbs. with full extension glides. Must pass SEFA 8 testing.

E. Shelves:

Shelves shall be constructed of 18 gauge steel, with channels formed on both the front and back edges. Shelf clips are made from 12 gauge stainless steel, and are to be adjustable vertically in 2" increments. Sliding shelves shall use the same ball bearing slides as drawer units.

F. Fabricated Accessories

All accessories required for specific installations shall be fabricated and finished to the same material and quality standards as the base units they will be made to.

G. Wall Cabinets:

Wall cabinets shall be made to the same quality standards as base units. Material used, as noted above. Shelf hangers are to be constructed of 12 gauge steel, and to easily adjust vertically in 2" inch increments.

Shelves are to be constructed with channel type fronts and backs, as well as flanged ends with nylon button glides. Wall units to have open fronts, sliding glass, framed glass sliding and swinging, or sliding and swinging steel doors as specified. Glass is plate, ground on all exposed edges.

Sliding door units to be furnished with extruded top and bottom channels as well as ball bearing rollers. All wall units are to be furnished with hanger brackets for ease of installation.

H. Floor Units:

Floor units shall be made to the same quality standards as base units. Material used, as noted above.

Shelves and shelf hanger construction, same as wall units.

Floor units to be furnished with the same front and door configurations as the above described wall units.

I. Corrosives Cabinets

Fully welded "cabinet within a cabinet" design. The outer cabinet is powder coated both inside and outside like standard metal casework. Inside cabinet to have a painted interior with a paint that has equal to or better chemical resistance to polypropylene. Paint or polypropylene must cover 100% of the interior cabinet which includes doors and shelf clips. Doors must have louvers to allow air into the cabinet for venting. Doors without louvers are not acceptable.

Cabinets to have an adjustable shelf to maximize space for different sizes of containers. All cabinets supplied must have a polypropylene or polyolefin vent kit. PVC vent kits are not acceptable.

J. Flammable Storage Cabinets

The Flammable Liquid Storage Cabinet is a "cabinet-within-a-cabinet" design with fully welded 18ga interior and exterior units. Both cabinets are completely powder coated inside and out, offering greater protection against corrosion than the standard double panel construction. This design creates a 1.5" airspace on all four sides as well as top and bottom for heat resistance up to 2400 degrees F.

The interior of the cabinet contains one fully adjustable shelf within the cabinet. Exterior depth of the cabinet is either 18" or 22" and interior depth is 14" or 18".

A 2" x 2" 12ga support angle is shipped with each cabinet for counter installation.

Doors have a continuous hinge and lever type handles with a hidden 3-point lock mechanism. Cabinets must be constructed in accordance to OSHA and NFPA 30. UL or FM approval testing by a third party must be completed and testing results supplied to Contractor or Architect if desired.

Mark with Factory Mutual approval and storage capacity.

Warning signs: Label cabinet: "FLAMMABLE – KEEP FIRE AWAY".

2.4 FINISH

- A. All surfaces shall be painted or plated, whether they are exposed or not. Paint shall be a chemically resistant baked on polyester powder coat finish.

General

This specification establishes the performance and appearance requirements for the interior decorative coatings and used on laboratory products. The material to be used for the coating will be applied dry over metallic substrates. The material must be available in a number of colors matched to supplier's industry standards.

The material shall be such that it can be applied in multiple coatings where needed, without inter-coat sanding. The shelf life of the material shall be six months at not more the 77 degrees without deterioration of properties.

Appearance

<u>Description</u>	<u>Test Procedure</u>	<u>Requirement</u>
A. Color	AES-C-0100	Pass
B. Light Resistant	QUV A Apparatus	48 hours w/o change in color or gloss
C. Thickness	Mill Gage	See page 3 of 3
D. Glass	ASTM D523-80 60 Degrees Glossmeter	30 Degree + 5 Matte 20 Degree + 5 Black

Performance

A. Hardness	ASTM D3363-74 (no indeptation)	3-H Min.
B. Impact Resistance	ASTM D2794-69	120 in-lbs w/o cracking
C. Flexibility	ASTM D522-60	No cracking or loss of adhesion at bend
D. Abrasion	Tabor abrasor CS 10 Wheel	14 mg. max. weight loss per 100 cycle
E. Humidity	ASTM D2247	288 hours exposure with no loss of adhesion or blistering
F. Salt Spray	ASTM B117-64 ASTM D1654-79	144 hours exposure with no rust. Max 1/8" rust creep from scribe line
G. Adhesion		90 of the squares show finish.

H. Chemical resistance:

<u>Reagent</u>	<u>Concentrations</u> <u>by Weight</u>	<u>Reagent</u>	<u>Concentrations</u> <u>by Weight</u>
Acetic Acid	98%	Acetone	
Formic Acid	88%	Ethyl Acetate	
Hydrochloric Acid	37%	Ethyl Alcohol	
Nitric Acid	25%	Ethyl Ether	
Nitric Acid	60%	Formaldehyde	37%
Phosphoric Acid	75%	Hydrogen Peroxide	5%
Sulfuric Acid	25%	Methyl Ethyl Ketone	
Sulfuric Acid	85%	Phenol	85%
Ammonium Hydroxide	28%	Xylene	
Sodium Hydroxide	10%		
Sodium Hydroxide	25%		

I. Scratch Resistance:

Hoffman Scratch	No Substrate
Hardness Tester	Appearance with 1000 gram

Application

Surface "A"

Description: Most critical of all areas. Completely exposed surface.
No defects allowed.

Surface "B"

Description: Not as critical as surface "A". Sometimes
exposed interior and exterior surfaces.

Surface "C"

Description: Hidden surfaces; areas that will not
be seen in normal use.

2.5 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Provide metal laboratory casework capable of withstanding the following loads without permanent deformation, excessive deflection, or binding of drawers and doors.
1. Shelves of Base, Wall, and Storage Cabinets: 200 lbs.
 2. Drawers: 100 lbs. with full extension glides
 3. Wall Cabinets: 150lbs/ft.
 4. Floor-Supported Base Cabinets: 100 lbs/ft/ within cabinets, 75-lbs/ft. countertop.

2.2 Counter TOPS and SINKS:

Basis of Supply or Fabrication: Total Laboratory Solutions

www.PhenolicResinLabs.com

Ph: 480.488.6421

Email: Sales@PhenolicResinLabs.com

Basis of Design: Trespa Solid Phenolic flat panels based on 30% thermosetting resins homogenously reinforced with 70% wood fibers and manufactured under high pressure and temperature to form a composite panel. Panels to have an integrated, decorative surface with pigmented resins cured using 'Electron Beam Curing' (EBC) technology, rendering the panel highly chemical resistant and highly antibacterial activity of > 99.99% reduction after 24 hours using testing method based on JIS Z 2801: 2000.

TRESPA TOPLAB PLUS COLORS:

- Color: **Black** T90.0.0. - Industry Standard - 3/4" and 1" Thick
- Color: **Slate Gray** T70.0.0 - 3/4" and 1" thick
- Color: **Mystic White** T18.0.1. - 3/4" and 1" Thick
- Color: **Regular White** T03.0.0. - 3/4" and 1" Thick
- Color: **Silver Grey** T03.4.0. - 3/4" and 1" Thick

Alternatively:

Basis of Supply or Fabrication: Total Laboratory Solutions,
Scottsdale, AZ 85266

www.Duratop-Epoxy.com

Ph: 480.488.6421

Email: David@DuratopEpoxy.Com

- A. Materials and Fabrication: Duratop Epoxy
1. General: Material shall be a monolithic, cast epoxy resin product and shall consist of a polymerized cast resin material and asbestos free inert materials shall be oven-cured in molds to obtain maximum chemical resistance, then removed from the molds and oven tempered to achieve maximum physical strength and stability. Surfaces have a uniform low-sheen surface and the finished material shall be extremely hard and resistant to scratches and abrasion.

Colors: Provide products that result in colors and materials complying with the following requirements:

- A. Color: Black Onyx or as indicated on architectural plans
- B. Thickness: 1 inch thick (25mm).
Other thickness available or as indicated on drawings.
- C. Edges and Corners: 1/8" (3mm) bevel machine top edge with blended radius corners or 3/16" radius.
Chamfer underside exposed edges.
- D. Surface: Work surfaces shall be furnished flat.

- A. Tops, General: Provide smooth, clean exposed tops and edges in uniform plane, free of defects. Make exposed edges and corners uniformly beveled. Provide front and exposed end overhang of 1 inch over base cabinets, formed with continuous drip groove on underside 1/2 inch from front edge.

- B. Fabricate with factory cutouts for sinks and with plain butt-type joints assembled with epoxy adhesive
 - 1. Sinks, General: Molded in one piece with surfaces smooth, corners coved and bottom sloped to outlet; 1/2-inch minimum thickness.
 - a. Provide sinks with 3/4-inch-wide lip around perimeter of sink for drop-in installation.
 - b. Provide sinks 1/2-inch thick for under mounting.
 - c. Cup Sinks: Epoxy or polypropylene, 3-by-6-inch nominal size.
 - d. Bond epoxy sinks installed in epoxy tops to tops and finish to produce an integral unit.

 - 2. Provide sizes indicated or manufacturer's closest standard size of equal or greater volume, as approved by Architect.

 - 3. Chemical Resistance: Duratop Epoxy or Trespa Solid Phenolic - resin material has the following ratings when tested with indicated reagents according to NEMA LD 3, test procedure 3.9.5:
 - a. Acetone: Moderate effect.
 - b. Acetic acid (98 percent): No effect.
 - c. Hydrochloric acid (37 percent): No effect.
 - d. Nitric acid (70 percent): No effect.
 - e. Phosphoric acid (85 percent): No effect.
 - f. Sulfuric acid (33 percent): No effect.
 - g. Benzene: No effect
 - h. Butyl alcohol: No effect.
 - i. Carbon tetrachloride: No effect.
 - j. Ethyl acetate: No effect.
 - k. Ethyl ether: No effect.
 - l. Formaldehyde: No effect
 - m. Phenol (85 percent): No effect.
 - n. Xylene: No effect.
 - o. Ammonium hydroxide (28 percent): No effect.
 - p. Sodium hydroxide (50 percent): Moderate effect.

4. Outlets: 1-1/2-inch NPS outlets with strainers and tailpieces a minimum of 6 inches long, of the same material as sink, or Polyethylene, as otherwise approved.

5. Overflows / Stopper sets: For each sink, except cup sinks, provide overflow of standard beehive or open-top design and with separate strainer. Height 2 inches less than sink depth. Stopper plug to be of same material as drain waste.

2.3 ACCESSORIES

B. Laboratory Wall Shelving: Provide wall shelving of materials indicated and as follows:

1. Solid Phenolic Shelving: Solid phenolic Trespa fabricated sheet complying with NEMA LD 3, 3/4" thick minimum, 1" thick maximum.
2. Color, Patterns, and Finishes: Provide materials and products that result in colors and textures of exposed shelf surfaces complying with the following requirements: NEMA LD3
3. Adjustable Shelf Supports: Surface-type steel standard and steel shelf brackets, with epoxy powder-coated finish, complying with BHMA A156.9.

C. Upright Rod Assembly and Metal Crossbar: Aluminum 3/4" diameter with two vertical rods 36" inch long and 1 horizontal crossbar, 3/4 inch diameter 39" inch long, unless otherwise indicated; 2 surface mount socket receptacles and 2 crossbar clamps. Taper ends of vertical rods to fit receptacles; all other rod ends are rounded.

D. Pegboards / Drying Racks: Trespa Solid Phenolic, Duratop Epoxy, Stainless-Steel or Polypropylene pegboards with polypropylene pegs and stainless-steel drip troughs.

E. Laboratory Window Sills / Stools - Provide solid phenolic Trespa Laboratory window sills as indicated on contract drawings.

1. Model: TopLab Plus.
2. Thickness: 3/4 inch (20mm) or 1 inch (25mm).

End of Specification