Solid Phenolic Work Surface Specification

LABORATORY CASEWORK SECTION
Division 12; sections 12 3600; 12 3650 and 12 3653 Laboratory Work Surface Tops Phenolic
12 35 53 Phenolic Cabinets; 12 35 53 Phenolic Furniture

2.6 WORK SURFACES

Solid Phenolic Resin Composite Laboratory Work Surfaces, with Epoxy sinks and Accessory

Producer: **Trespa™ Top Lab Plus Solid Phenolic**
Supplier / Fabricator: **Total Laboratory Solutions**

REFERENCES

A. ASTM International (ASTM):

1. D570 - Standard Test Method for Water Absorption of Plastics.
2. D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
3. D648 - Standard Test Method for Deflection Temperature of Plastics Under Flexural load in edgewise Position.
4. D695 - Standard Test Method for Compressive Properties of Rigid Plastics.
5. D696 - Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30^0 C and 30^0 C with a Vitreous Silica Dilatometer.
6. D785 - Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials.
7. D790 - Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
8. D792 - Standard Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
9. D3801 - Standard Test Method for Measuring the Comparative Burning Characteristics of Solid Plastics in a Vertical Position.
10. E84 - Standard Test Method for Surface Burning Characteristics of Building Material.

GREENGUARD Environmental Institute (GREENGUARD):

11. Indoor Air Quality Certification Program.
12. Children and Schools Certification Program.

B. International Organization for Standardization (ISO) 9001 - Quality Management Systems - Requirements.

C. NSF International / American National Standards Institute (NSF/ANSI) - 51 - Food Equipment Materials.

D. Scientific Certification Systems (SCS) - Recycled Content Certifications.

E. Scientific Equipment and Furniture Association (SEFA) 3 - Work Surfaces.

Materials and Fabrication:

General: Material shall be a solid, hard and made of wood-based fibers with thermosetting phenolic resin pressed under high heat and pressure to form a composite material formulated to provide a work surface with chemical and heat resistance characteristics. The combination of asbestos free inert filler material, wood fibers and phenolic resin shall be press cured in order to achieve maximum chemical resistance and physical strength and stability. Surfaces shall have a uniform low-sheen matte crystal smooth surface finish and the material shall be extremely hard and resistant to heat, chemical attack, self-extinguishing and non-absorptive in nature.

Products of Solid Phenolic to be certified for the following:
PEFC and FSC Certified
Low VOC off-gasing: 0.22 mg/(mm^3) or 220 g/l or 0.22 mg/m3

Trespa TopLab Plus® solid phenolic is manufactured by Trespa® North America. TopLab$^{Plus®}$ is a self-supporting flat panel based on thermosetting resins, homogeneously reinforced with cellulose fibers and manufactured under high heat and pressure. The panels have a pigmented resin, decorative surface that is electron-beam cured. TopLab^{Plus} provides high aesthetics and a quality appearance for applications for sterile and chemically resistant laboratory work surfaces.

Fabricated and Supplied by:
Total Laboratory Solutions
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Ph: 480-488-6421
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Thickness:

SELECT ONE

- ☐ 1" thick (25 mm) (industry standard)
- ☐ 3/4" thick (19 mm)
- ☐ 5/8" (16 mm)
- ☐ ½" (12.5 mm)

Edges and Corners: Exposed work surface edges and corners, except as indicated, shall be furnished with:

SELECT ONE

- ☐ 1/8" (3.175 mm) machined beveled top edge with blended bevel corners
- ☐ 1/4" (6 mm) machined radius top edge with blended radius or bevel corners

Surface: Work surfaces shall be furnished as:

SELECT ONE

- ☐ Flat only with finished exposed edges (Industry Standard)
- ☐ Flat with 1/4" (6 mm) raised marine edge on designated edges, field applied.
- ☐ Flat with 1/4" (6 mm) marine edge only at epoxy sink locations, field applied.

Backs and Side Splashes:

SELECT ONE

- ☐ Supplied loose, cut to size, for field application in the same material and thickness as countertops. Curbs as installed shall be 4" high (100 mm) typical, unless otherwise indicated on drawings. Backsplash and return side splash curbs will be bonded to the tops at the jobsite with epoxy resin adhesive. Include top mounted end curb where worksurfaces abut walls, fume hoods, and locations detailed on drawings.

Colors:

SELECT ONE

- ☐ **Black** (industry standard) - Code: T 90.0.0
- ☐ Slate Gray (New - Similar to Graphite Gray Epoxy) - Code: T 70.0.0
- ☐ Silver Gray – Code: T 03.4.0
- ☐ Mystic White – Code: T 18.0.1
- ☐ Regular White – Code: T 03.0.0
- ☐ Pastel Grey – Code: T 03.1.0

Warpage: Inspect work surface for warpage before fabrication or installation. Measure in unrestrained condition. Work surface will be accepted for use if there is no gap exceeding 1/16" (1.59 mm) in a 36" (914 mm / 0.9 mtr) span or 3/16" (4.5 mm) in 96" (2438 mm) span.

Fabrication: Provide in longest practical lengths, 96" (2438 mm) or 120" (3048 mm) being maximum available. All seam joints shall be bonded with a highly chemical and corrosion resistant 2 part epoxy adhesive. Provide 1/8" (3.17 mm) drip groove on front underside of exposed edges set back 1/2" (12.5 mm) from edge at all sink areas and where shown on drawings. All exposed edges to be finished.

Slab Sizes: 60.24" x 120.08" Nominal 5' x 10'; and 73.23" x 100.40" Nominal 6' x 8'. (1530 x 3050 mm) and 1860 x 2550 mm), fabricated, cut to sizes required.

Thickness Tolerances: Each top corner shall not deviate more than plus / minus 1/16" (1.59 mm) from nominal.

Size Tolerances: Length, plus / minus 1/8" Width (3.17 mm), plus / minus 1/16" (1.59 mm).

Squareness: Compare the diagonal corner-to-corner measurements across the width of each work surface. The diagonal measurements must be within 1/16" (1.59 mm).

Penetrations: Location of cutouts and drillings: Plus / minus 1/8" (3.17 mm). Cutout sizes and drillings: Plus / minus 1/16" (1.59 mm).

Fastening Tops to Base Cabinets:

1. Secure solid phenolic Trespa TopLabPLus to cabinets with silicone adhesive, applied at each corner and continuously along perimeter edges.
2. Maximum penetration of screws into underside of solid phenolic countertops shall not be installed closer than ¼" (6 mm) below the top surface, unless instructed otherwise by countertop manufacturer.
3. Abut solid phenolic top and edge surfaces in one true plane with flush hairline joints or with 1/16" to 1/8" (1.58 mm to 3.17 mm) seam, filled with either epoxy resin adhesive or silicone.

Chemical Resistance:

Test Methods:

Volatile chemicals (organic solvents): A cotton ball, saturated with the test chemical (reagent) is placed in a one-ounce bottle (10 x 75 mm test tube or similar container) with a reservoir of liquid above the ball. The container is inverted on the test material for a period of 24 hours at a standard temperature of 23° plus / minus 2°C. (73°F plus / minus 4°F).

Non-Volatile Chemicals: Five drops (1/4 cc) of the test chemical are placed on the test material surface. The chemical is covered with a watch glass 1" (25 mm) for a period of no less than 24 hours at a standard temperature of 23° plus / minus 2°C. (73°F plus / minus 4°F).

Evaluation Ratings:

After exposure for 24 hours, all surfaces are washed with clear clean water, then a detergent solution, finally with naphtha, then rinsed with distilled water and dried with a cloth. Change in surface finish and function shall be described by the following (1-5) ratings:

1) No Effect: No detectable change in the material surface.
2) Excellent: Slight detectable change in color or gloss, but no change to the function or life of the work surface material.

3) Good: Clearly discernible change in color or gloss, but no significant impairment of surface life or function.
4) Fair: Objectionable change in appearance due to surface discoloration or etch, possibly resulting in deterioration of function over an extended period.
5) Failure: Pitting, cratering or erosion of work surface material; obvious and significant deterioration.

Chemical resistance is affected by the type of chemical, its concentration, ambient temperature, humidity, time and housekeeping practices. Panels are to be provided with minimum performance in accordance with chemical resistance test per SEFA 8. End users should test phenolic panels in actual work environments. Generally, with proper housekeeping (spills cleaned immediately), the following listed chemicals cause no detectable stain, loss of gloss or change in work surface.

After 24 hours, the following showed a slight or noticeable stain with Black Trespa TLP:
98% Sulfuric, 65% Nitric, Iodine Crystal and Iodine solution 1%. The balance of chemicals tested did not stain or stains could be cleaned leaving a normal surface. Resistance to staining may be color dependent.

Minimum acceptable test results shall be equal to or better than the following rating:

Hydrochloric Acid 10,37%	Sulfuric Acid 10, 33, 98%	Nitric Acid 10,30,65%
Nitric/HCL 65%/37%	Chromium Oxide 60%	Phosphoric Acid 85%
Perchloric Acid 70%	Glacial Acetic Acid 99%	Sodium Hydroxide 20%
Ammonium Hydroxide 28%	Silver Nitrate 1%	Ferric Chloride 10%
Potassium Permanganate 10%	Copper Sulfate 10%	Sodium Hypochlorite 13%
Sodium Chloride 10%	Potassium Iodide 10%	Iodine Crystal
Iodine Solution 1N	Formaldehyde 37%	Furfural
Developer (paper)	Developer (negative)	Fixation Bath
Bleaching Bath	Stabilizer B	Acetone
Acetonitrile	Ethyl Alcohol	Ethylene Glycol
Methylethylketone	Methylene Chloride	Ethyl Acetate
Acetic Anhydride	n-Butyl Acetate	n-Hexane 97%
Methyl Alcohol	Methyl lsobutyl Ketone	Tetrahydrafurane
Toluene	Trichlorethylene	Xylene
Acridine Orange 1%	Alizarin Complexone Dihydrate .5%	Aniline Blue water sol. 1%
Basic Fuchsin 1%	Carbol Fuchsin 1%	Carmine .5%
Congo Red 1%	Gentian Violet 1%	Eosin B 1%
Giemsa Stain 1%	Malachite Green Oxalate 1%	Methylene Blue 1%
Methyl Violet 2B 1%	Safranine O 1%	Sudan III 1%
Wright Stain	Cacao butter	Proteins

Other Characteristics:

A. Finish: Matte sheen – Crystal smooth Top Lab Plus or quartz finish on Athlon only

B. Core color **–** Black only

C. Modulus of Elasticity: 1,500,000 psi minimum

D. Shear Strength: 2000 psi minimum

E. Compressive Strength: 24,000 psi minimum.

E. Weight: 93 pcf maximum.

G. Fire Performance: Maximum flame-spread of 25 per ASTM E84 (Class 1, Class A) for panels 5/8" thick and greater.

H. Porosity: Nonporous surface and edges.

I. Microbial Characteristics: Will not support micro organic growth.

J. Chemical Resistance: Provide panel with minimum performance in accordance with chemical resistance test per SEFA 8.

Testing Requirements:

Hardness (ASTM D785):
Test Method: Hardness, Rockwell M "M" Scale; average of five readings.
Minimum Acceptable Test Results: Average value of 100 over the five samples.

Water Absorption (ASTM D570):
Test Method: Specimens measuring 3" (75 mm) in length by 1" (25 mm) in width by the thickness of the material should be used. At least three specimens should be tested. After weighing, specimens should be entirely immersed in distilled water maintained at a temperature of 23° plus or minus 1°C. (73.4° plus or minus 1.8°F) for a period of 24 hours. The samples should then be removed, dried and weighed to the nearest 0.001g. The percentage of increase in weight calculated to the nearest 0.01% should then be calculated. Minimum Acceptable Test Results: 0.01%.

Flammability or Rate of Burning (ASTM D794):
Test Method: Measure "Average Time of Burning (ATB)" as described in test. At least 5 samples (125 mm +/- 5 mm in length by 12.5mm +/- 0.2 mm in width) should be tested.
Minimum Acceptable Test Results: ATB should equal zero.

Porcelain Crucible - Test A (Non-Standard Test)
Test Method: a high-form porcelain crucible, size D, 15ml capacity, shall be heated over a Bunsen burner until the crucible bottom attains an incipient red heat. Immediately, the hot crucible shall be transferred to the top surface and allowed to cool to room temperature.
Minimum Acceptable Test Results: Upon removal of the cooled crucible, there shall be no blisters or cracks. Slight dulling or color change is acceptable.

Heat Deflection @ 264 psi (ASTM 648)
Minimum Acceptable Test Results: 193ºC (380ºF)

Falling Ball Impact Resistance (ERF 23-69):
Test Method: Careful attention to details of test procedure should be followed. A wooden supporting frame must be used with the test. Size of samples: 12" x 12" (305 x 305 mm) by the thickness of the material. Steel balls of 2 lbs. (0.907 kgs) should be used. Three or more samples should be tested from a maximum height of 8′ (2.42 m).
Minimum Acceptable Test Result: No fracture to a height of 7′ (2.12 m).

Thermal Shock Resistance (Non-Standard Test):
Test Method: Two cubes 2" x 2" (50 x 50 mm) by thickness of material are immersed in a dry ice/acetone bath maintained at minus 78ºC. The cubes are allowed to remain in the bath for 15 minutes. Each cube is removed and immediately placed in a container of boiling water at 100ºC. The procedure is repeated until failure occurs (i.e., cracking, warpage, distortion) for a series of five repetitions.
Minimum Acceptable Test Results: No visible changes should be observed.

Flexural Strength and Modulus of Rupture (ASTM D790):
Test Method: Test specimens should be prepared from 1" thick (25 mm) production material with a support span 16 times the depth (thickness) of the beam. The original surface of the sample should be unaltered. Recommended sample size is 19.5" x 1.0" x 1.0" (495 x 25 x 25 mm) (length x width x depth). A minimum of five samples are to be tested. Testing should be carried out to failure of the test sample. Modulus of rupture should be measured as described in the ASTM method.
Minimum Acceptable Test Result: Flexural Strength: 10,000 psi / Modulus of Rupture: 1,000,000psi.

SINKS AND ACCESSORIES SECTION:

EPOXY SINKS - Supplier – Total Laboratory Solutions, Scottsdale, AZ 85266

1. **Lipped Drop-In - DURATOP™ Epoxy Sinks: See Website for Model Numbers.**

Description: Integrally molded from filled thermosetting cast epoxy resin, and oven cured. Nominal wall thickness of 1/2" (12.5 mm) and overall rim width of ¾" (19 mm) per edge. All interior corners are coved to 1-1/2" (38 mm) radius and bottoms pitched to the outlet opening.

a. Lipped Drop-In Sinks shall be installed with the top edge of the sink rim positioned 1/8" (3.175 mm) below the work surface into a rabbeted or rebated ledge, with a 30° bevel from the top of the worksurface to the top of the sink lip. The sink joint shall not exceed 1/8" (3.175 mm) plus or minus 1/16" (1.58 mm).

b. Sealant: Join work surface and sinks with a 2-part epoxy grout adhesive.

c. **Sink Color:** Black, Graphite Gray, Light Gray, Forest Green, Powder Blue, Platinum Grey, Pearl gray, Sand Tan, Navy Pacific Blue or Bright White to match or contrast with adjacent work surfaces of Trespa Top Lab Plus solid phenolic.

2. **Under Counter Mount - DURATOP™ Epoxy Sinks: See Website for Model Numbers**.

Description: Integrally molded from modified thermosetting epoxy resin, and oven cured. Nominal wall thickness of 1/2" (12.5 mm) with all interior corners coved to 1-1/2" (38 mm) radius and bottoms pitched to the outlet opening.

a. Undercounter mounted sink shall be installed from underside of countertop.

b. Join work surface and sink with a 2-part epoxy grout adhesive or with a lab grade silicone

c. Sink supports, hanging systems or other rod supports required – See below #9.

d. **Sink Color:** Black, Graphite Gray, Light Gray, Forest Green, Powder Blue, Platinum Grey, Pearl gray, Sand Tan, Navy Pacific Blue or Bright White to match or contrast with adjacent work surface of Trespa Top Lab Plus solid phenolic.

ACCESSORIES - Supplier – Total Laboratory Solutions

3. **Sink Outlets or Wastes:**

a. Molded Polyethylene (industry standard) **Model # EF-PPSW-85**

b. Sink outlets shall accommodate a plastic disc strainer. Provide outlet with 3 5/16" (84.14 mm) outlet flange ring, 3 5/16" (84.14 mm) mechanical washer and nut assembly and 1.5" (38 mm) I.D. NPSM threads. Unit to be up to 4" (100 mm) in length.

c. Outlet Color: Black

4. **Sink Overflows:**

a. Molded polyethylene (industry standard) **Model # EF-PPWT-158**

b. Sink overflows shall have an open intake located at least 2" (50 mm) lower than the sink rim when installed. The overflow base shall taper to fit all 1.93" (49 mm) outlet openings.

c. Overflow Color: Black

5. Sink Stoppers:

a. Molded polyethylene (industry standard) **Model # EF-PPPG-150**

b. Sink stopper to block drainage of water through the 1.5” (38 mm) drain hole.

c. Stopper Color: Black

6. Epoxy Adhesive:

a. Two part chemical resistant adhesive **Model # Smooth-on Adhesive PC-3**

b. Part’s “A” Resin and Part’s “B” Hardener mixed 1 to 1 ratio

c. Epoxy Adhesive Color: Black – Other colors available as required.

7 **Bottle Traps:**

a. Molded Polyethylene (industry standard) **Model # EF-PPBT-190**

b. Size 1.57” to 4.00” (40 to 100 MM) adjustable Inlet bottle trap, with integrated 1.5" (38 mm) NPSM threads.

c. Bottle Trap Color: Black

8. Polyethylene Cup sinks:

a. Molded Polyethylene Cup sinks (industry standard)

Size: Nominal 3” x 6” (76 mm x 152 mm)- Oval **Model # EF-PPCS-176**
Size: Nominal 3” x 9” (76 mm x 228 mm)- Oval **Model # EF-PPCS-248**
Size: Nominal 6.77” (172 mm) - Round **Model # EF-PPCS-172**

SELECT ONE

☐ a. Flush mounted cup sinks shall be Polyethylene.
Cove inside corners and pitch bottom to integral 1-1/2" (38 mm) NPSM threaded outlet.

☐ b. Surface mounted cup sinks shall be Polyethylene.
Cove inside corners and pitch bottom to integral 1-1/2" (38 mm) NPSM threaded outlet.

c. **Cup sinks color:** Black

9. Steel Sink Supports, Epoxy Powder Coated: Models TLS-SS-24”- 48”, etc. or as required.

Epoxy Powder Coated system, corrosion resistant, with the following components:

a. Two each face plates 19 ½” Long x 5” Wide (495 mm x 127mm)
Six each screw holes for attaching to side walls of sink base cabinets, 3 per long edge
Twenty holes (10 per side) for connection to adjustable “J” hooks

b. Four each “J” hooks, 16” (406 mm) long x ¼” (6 mm) diameter x 3 ½” Hook (88 mm)

c. Two each Steel “C” Shaped support rods, 2 1/8” Wide (54 mm) x Length required of cabinet opening. Two Holes (one per end) to receive adjustable “J” hook, Nut and washer assembly.

Complementary products or applications of SPC (Solid Phenolic Compact) panels:

A. **Laboratory Shelving:** Provide solid phenolic laboratory shelving as indicated. Shelving shall be chemical resistant TopLab Plus in 1/2"; 5/8"; 3/4" or 1" thickness.

B. **Pegboards / Drying Racks:** Provide solid phenolic pegboards as indicated. Pegboards shall be TopLab Plus in 1" thickness, with stainless steel drip tray and poly pegs.

C. **Reagent Racks:** Provide solid phenolic reagent rack as indicated. Reagent racks shall be TopLab Plus in 3/4" or 1" thickness.

D. **Window Sills:** Provide solid phenolic window sills as indicated. Window sills shall be chemical resistant TopLab Plus in 1/2"; 5/8"; 3/4" or 1" thickness.

Offered by:
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