DURCON
A WILSONART COMPANY

SECTION 12 3653

LABORATORY WORKSURFACES

Specifier Note: The following specification contains design options and must be edited to meet project requirements. To edit in MS Word, download the PDF, right-click the file icon, hover over Open With, then select Word.

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Epoxy resin [worksurfaces] [sinks] [and] [accessories].
2. Setting materials.

B. Related Sections:
1. Division 01: Administrative, procedural, and temporary work requirements.
2. Section [05 5000 - Metal Fabrications] [__ ____ - _____] - Steel supports.
3. Section [06 1000 - Rough Carpentry] [__ ____ - _____] - Wood supports.
4. Section [07 9200 - Joint Sealers] [__ ____ - _____] - Joint sealers.
5. Section [09 2900 - Gypsum Board] [__ ____ - _____] - Cementitious backer unit substrate.
6. Section [06 4100 - Architectural Wood Cabinets] [__ ____ - _____] - Base cabinets.
7. Section [12 3100 - Manufactured Wood Casework] [__ ____ - _____] - Base cabinets.
8. Section [12 3200 - Manufactured Metal Casework] [__ ____ - _____] - Base cabinets.
9. Section [12 3400 - Manufactured Plastic Casework] [__ ____ - _____] - Base cabinets.
10. Section [12 3500 - Specialty Casework] [__ ____ - _____] - Base cabinets.
11. Section [22 4000 - Plumbing Fixtures] [__ ____ - _____] - Plumbing fixtures and trim.

1.2 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 Oad 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 Materials.

B. GREENGUARD Environmental Institute (GREENGUARD):
1. Indoor Air Quality Certification Program.
2. Children and Schools Certification Program.

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

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

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

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

1.3 SUBMITTALS

A. Submittals for Review:
   1. Shop Drawings:
      a. Submit plan, section, elevation and perspective drawings necessary to describe and convey layout, profiles, and product components, including edge conditions, joints, fitting and fixture locations, anchorage, accessories, and finish colors.
      b. Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on Shop Drawings.
      c. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.
   2. Product Data: Manufacturer's data sheets on each product to be used, including:
      a. Preparation instructions and recommendations.
      b. Storage and handling requirements and recommendations.
      c. Installation methods.
   3. Samples:
      a. Selection samples: For each finish product specified, submit complete set of color chips representing manufacturer's full range of standard colors.
      b. Verification samples: For each finish product specified, submit samples representing actual product color; supplied product color and gloss may vary slightly from supplied samples.

B. Quality Control Submittals:
   1. Test Reports: Certified test reports or recognized evaluation reports showing compliance with specified performance characteristics and physical properties.

C. Sustainable Design Submittals:
   1. Recycled Content: Certify percentages of post-consumer and pre-consumer recycled content.
   2. Regional Materials: Certify products extracted, processed, and manufactured within 500 mile radius of Project site.
   3. Low-Emitting Materials: Certify volatile organic compound (VOC) content.

D. Closeout Submittals:
   1. Maintenance Data:
      a. Provide maintenance, cleaning, and life cycle information.
      b. Include recommended cleaning materials and procedures, and list of materials detrimental to epoxy resin.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications:
   1. Primary products furnished by single manufacturer with minimum [10] [__] years [documented] experience in work of this Section.
   2. Products manufactured in ISO 9001 certified facility.

B. Installer Qualifications: Minimum [5] [__] years [documented] experience in work of this Section.

C. Mockup:
1. Construct worksurface mockup, [6] [__] feet wide x full depth.
2. Include worksurface, and trim.] [____.]
3. Locate [where directed.] [____.]
4. Approved mockup may [not] remain as part of the Work.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery:
1. Use pallets larger than sheets during transportation.
2. Package materials to prevent damage during shipping and handling.

B. Storage:
1. Store products in enclosed area protected from ultraviolet.
2. Store products in manufacturer's unopened packaging until ready for installation.
3. Store panels using protective dividers to avoid damage to surfaces.
4. For horizontal storage, store sheets on pallets of equal or greater size than sheets with protective layer between pallet and sheet and on top of uppermost sheet.
5. Do not store sheets or fabricated panels vertically.

C. Handling:
1. If protective film is provided, do not remove until panel has been installed.
2. Handle sheets to prevent damage.
3. Remove stickers immediately after installation.

1.6 PROJECT CONDITIONS

A. Do not install products under environmental conditions outside manufacturer's limits.

B. Avoid direct exposure of products to sunlight.

C. Do not use worksurfaces as bench, ladder, or seating.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Contract Documents are based on products by Durcon, Incorporated, 206 Allison Drive, Taylor, TX 76574, 512-595-8000, www.durcon.com.

B. Substitutions: [Under provisions of Division 01.] [Not permitted.]

2.2 MATERIALS

A. Solid Epoxy Resin:
1. Sheets cast from modified epoxy resin and non-asbestos inert fillers; compounded mixture cured and thermoset specifically from formulation to provide exceptional physical and chemical resistance required in medium to heavy duty laboratory environments.

**** OR ****

2. Sheets cast from modified epoxy resin and non-asbestos inert fillers with 10 percent of filler certified as post-consumer glass by SCS; compounded mixture cured and thermoset specifically from formulation to provide exceptional physical and chemical resistance required in medium to heavy duty laboratory environments.

3. Sheets monolithic throughout without surface coating application.
4. Certified to NSF/ANSI 51.
5. Certified by GREENGUARD under Indoor Air Quality and Children and Schools Certification Programs.
6. Physical properties; minimum acceptable physical performance in accordance with SEFA 3 testing procedures:
   a. Density/specific gravity: Tested to ASTM D792; minimum test rating of 134.8 PSF or 2.16 gcm.
   b. Rockwell hardness: Tested to ASTM D785; minimum M scale rating of 110.
   c. Fire resistance: tested to ASTM D635; classified as self-extinguishing.
   d. Surface burning characteristics: Tested to ASTM E84; flame spread index 7.4 and smoke develop index of 221.2.
   e. Surface burning characteristics in vertical position: Tested to ASTM D3801; maximum flame spread index of 7.4 and smoke developed index of 221.2.
   f. Coefficient of linear thermal expansion: Tested to ASTM D696; rating of 2.46 x 10-5.
   g. Heat deflection: Tested to ASTM D648; maximum 205 degrees F or 96 degrees C.
   h. Flexural strength: Tested to ASTM D790; minimum rating 14.9 KPSI or 103 Mpa.
   i. Flexural modulus: Tested to ASTM D790; 2,777,501 PSI or 19.2 Gpa.
   j. Water absorption, 24 hours: tested to ASTM D570; maximum 0.008 percent by weight.
   k. Compression strength: Tested to ASTM D695; minimum 38.4 kpsi or 265 Mpa.
   l. Chemical resistance; minimum acceptable chemical resistance performance in accordance with SEFA 3:

Reagent Tested	**Method**	**Rating**
Amyl Acetone	A	0
Ethyl Acetate	A	1
Acetic Acid 98%	B	0
Acetone	A	1
Acid Dichromate 5%	B	0
Butyl Alcohol	A	0
Ethyl Alcohol	A	0
Methyl Alcohol	A	0
Ammonium Hydroxide, 28%	B	0
Benzene	A	1
Carbon Tetrachloride	A	0
Chloroform	A	1
Chromic Acid 60%	B	0
Cresol	A	0
Dichloro Acetic Acid	A	0
Dimethylformanide	A	0
Dioxane	A	1
Ethyl Ether	A	0
Formaldehyde 37%	A	0
Formic Acid 90%	B	1
Furfural	A	0
Gasoline	A	0
Hydrochloric Acid, 37%	B	0

Hydroflouric Acid 48%	B	3
Hydrogen Peroxide 28%	B	0
Tincture of Iodine	B	0
Methyl Ethyl Ketone	A	1
Methylene Chloride	A	1
Mono Chlorobenzene	A	1
Napthalene	A	0
Nitric Acid, 20%	B	0
Nitric Acid, 30%	B	0
Nitric Acid, 70%	B	0
Phenol 90%	A	0
Phosphoric Acid, 85%	B	0
Silver Nitrate, Saturated	B	0
Sodium Hydroxide, 10%	B	0
Sodium Hydroxide, 20%	B	1
Sodium Hydroxide, 40%	B	1
Sodium Hydroxide, Flake	B	0
Sodium Sulfide, Saturated	B	0
Sulfuric Acid, 25%	B	0
Sulfuric Acid, 85%	B	1
Sulfuric Acid, 96%	B	3
Sulfuric Acid 85%, and Nitric Acid 70%, equal parts	B	1
Toluene	A	0
Trichlorethylene	A	1
Xylene	A	0
Zinc Chloride, Saturated	B	0

Testing Method Descriptions:

Method A - Volatile chemicals (organic solvents): Cotton ball saturated with test reagent is placed in one-ounce bottle (20 x 75mm test tube or similar container) with reservoir of liquid above ball. Container is inverted on test material for period of 24 hours at standard temperature 23 degrees C plus or minus 2 degrees C (73 degrees F plus or minus 4 degrees F).

Method B - Non Volatile Chemicals: Five drops (1/4 cc) of test reagent are placed on test material surface. Reagent is then covered with watch glass (25 mm) for period of no less than 24 hours at standard temperature of 23 degrees C plus or minus 2 degrees C (73 degrees F plus or minus 4 degrees F).

Result Definitions:

0 - No Effect: No detectible change in material surface.

1 - Good: Slight detectable change in color or gloss but no change to function or life of work surface material.

2 - Fair: Slight surface etching or severe staining. Clearly discernable change in color or gloss but no significant impairment of surface life or function.

3 - Poor: Pitting, cratering or erosion of work surface material; obvious and significant deterioration. Objectionable change in appearance due to surface discoloration.

6. Color: [To be selected from manufacturer's standard color range.] [Black Onyx.] [Graphite.] [Gray.] [Forest Green.] [Steel Blue.] [Tan.] [White.]

2.3 ACCESSORIES

A. Provide solid epoxy resin [laboratory shelving] [laboratory fume hood base work surfaces] [pegboards] [reagent racks] where indicated.

B. Installation Materials: Manufacturer's joint adhesive, panel adhesive, and sealants as required to suit project conditions.

2.4 FABRICATION

A. Fabricated tops and accessories in accordance with manufacturer's recommendations, approved Shop Drawings, and SEFA 3.

B. Epoxy Resin Worksurfaces:

1. Thickness:
   a. [3/4 inch (19 mm)] [1 inch (25 mm)] [1-1/4 inches (32 mm)] unless otherwise indicated.
   b. Check each sheet at factory for required thickness.
   c. Maximum variation in thickness: plus or minus 1/16 inch (1.6 mm) from corner to corner.
2. Warpage:
   a. Inspect tops for warpage prior to fabrication by placing on true flat surface.
   b. Maximum allowable warpage: 1/16 inch (1.5 mm) in 36 inch (900 mm) span or 3/16 inch (4.5 mm) in 96 inch (2400 mm) span.
3. Fabrication:
   a. Shop fabricate in longest practical lengths.
   b. Bond joints with highly chemical resistant cement with properties and color similar to base material.
   c. Provide 1/8 inch (3 mm) drip groove at underside of exposed edges, set back 1/2 inch (13 mm) from face.
   d. Finish exposed edges.
4. Fabricate tops [flat] [with 1/4 inch (6 mm) raised marine edge.] [Flat with 1/4 inch (6 mm) raised marine edge at epoxy sink locations.
5. Edge treatment: [Standard 1/8 inch (2 mm) chamfered edge.] [Standard 1/4 inch (2 mm) radius edge.] [Standard 1/8 inch (2 mm) chamfered edge with drip groove.] [Standard 1/4 inch (2 mm) radius edge with drip groove.] [As indicated on Drawings.]
6. Corner treatment: exposed corners shall be eased slightly for safety.
7. Back and end splashes:
   a. Supplied loose for field installation.
   b. Same material and thickness as worksurfaces.
   c. [4] [__] inches ([100] [__] mm) high unless otherwise indicated.
   d. Top-mounted end splash where worksurfaces abut adjacent construction at and locations indicated on Drawings.

**** OR ****

8. Back and end splashes:
   a. Integrally molded, [4] [__] inches ([100] [__] mm) high with 5/8 inch (16 mm) coved juncture to top surface.

b. Furnish loose end splashes where worksurfaces abut adjacent construction and locations indicated on Drawings.

9. Joints: [As indicated on Drawings.] [Maximum 1/8 inch (2 mm), bonded with epoxy grout.] [____.]
10. Make joints between two benches level.
11. Locate joints away from sinks and over or near supports.
12. Sink cutouts: [As indicated on Drawings.] [Routed for drop-in sink.] [Routed for undermount sink.] [Sink cutout with cover.] [____.]
13. Allowable tolerances:
    a. Square: Plus or minus 1/64 inch (0.4 mm) for each 12 inches (300 mm) of length.
    b. Location of cutouts and drilled openings: Plus or minus 1/8 inch (3 mm) of design dimension.
    c. Size of cutouts and drilled openings: Plus 1/8 inch (3 mm) or minus 0 inches (0 mm).

C. Epoxy Resin Sinks:
1. Mold sinks from thermosetting epoxy resin.
2. Mold interior corners to radius. Slope sink base to drain outlet.
3. Provide 1-1/2 inch (38 mm) outlet with open ended standpipe; standpipe overflow 2 inches (50 mm) shorter than depth of sink.
4. Unless otherwise indicated, fabricate sinks of drop-in design supported by upper flange from worksurface.
5. Color: To match adjacent worksurface.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until cabinets have been installed.

B. Confirm that surfaces to receive tops are plumb and level, with maximum deflection of 1/4 inch (6 mm) in 20 feet (6 m).

3.2 PREPARATION

A. Clean surfaces just prior to installation.

B. Prepare surfaces using methods recommended by manufacturer.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved Shop Drawings.

B. Install tops plumb and level.

C. Scribe to adjacent surfaces in accordance with manufacturer's recommendations.

D. Fasten tops to supporting construction with adhesives appropriate for use with adjoining construction and as recommended by manufacturer.

E. Form field joints using manufacturer's recommended adhesive. Form joints to be inconspicuous and nonporous.

F. Install [laboratory shelving] [laboratory fume hood base work surfaces] [pegboards] [reagent racks] using fasteners and adhesive appropriate for use with adjoining construction and as recommended by manufacturer.

3.4 PROTECTION

A. Protect installed products until completion of Project.

B. Touch up, repair, or replace damaged products.