AMERICAN EPOXY SCIENTIFIC

PART 1 - GENERAL SECTION 12 3653 LABORATORY WORKSURFACES

1.1 SUMMARY

A. Section Includes:
   a. Epoxy Resin [work-surfaces], [sinks] [and] [accessories].
   b. Utility-space framing at backs of base cabinets.
   c. Filler and closure panels.
   d. Laboratory casework system that includes support and utility-space framing, filler and closure panels, wall panels, under-cabinet lighting, and modular countertops.
   e. Laboratory countertops.
   f. Tables.
   g. Shelves.
   h. Laboratory sinks and troughs.
   i. Laboratory accessories.
   j. Water, laboratory gas, and electrical service fittings.
   k. Setting materials.

B. Related Requirements:
   a. Division 01: Administrative, Procedural and Temporary Work Requirements.
   b. Section [05 5000–Metal Fabrications] [_____-_____] – Steel Supports.
   c. Section [06 1000-Rough Carpentry] [_____-_____] – Wood Supports.
   d. Section [07 9200-Joint Sealers] [_____-_____] – Joint Sealers.
   e. Section [09 2900-Gypsum Board] [_____-_____] – Cementitious Backer Unit Substrate.
   f. Section [06 4100-Architectural Wood Cabinets] [_____-_____] - Base Cabinets.
   g. Section [12 3100-Manufactured Wood Casework] [_____-_____] - Base Cabinets.
   h. Section [12 3200-Manufactured Metal Casework] [_____-_____] – Base Cabinets.
   i. Section [12 3400-Manufactured Plastic Casework] [_____-_____] – Base Cabinets.
   j. Section [12 3500-Sepcialty Casework] [_____-_____] – Base Cabinets.
   k. Section [22 4400-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. D695 – Standard Test Method for Compressive Properties of Rigid Plastics.
   4. D696 – Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between 30° C and 30° C With a Vitreous Silica Dilatometer.
   5. D785 – Standard Test Method for Rockwell Hardness of Plastics and Electrical Insulating Materials.
   6. D790 – Standard Test Method for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
   7. D792 – Standard Test Method for Density and Specific Gravity (Relative Density) of Plastics by Displacement.

B. GREENGUARD Environmental Institute (GREENGUARD)
   a. Indoor Air Quality Certification Program.
      Children and Schools Certification Program. (GREENGUARD GOLD)

C. Scientific Equipment and Furniture Association (SEFA) 3 – Work Surfaces.

D. Laboratory Builder’s Association.

E. International Surface Fabricator’s Association (ISFA).

1.3 COORDINATION

A. Coordinate layout and installation of framing and reinforcements for support of laboratory casework.
B. Coordinate installation of laboratory casework with installation of laboratory equipment.

1.4 ACTION SUBMITTALS

A. Submittals for Review:
   a. Product Data: Manufacturer's Data Sheet for Each Product to be Used.
      a. Preparation Instructions and Recommendations.
      b. Storage and Handling Requirements and Recommendations.
      c. Installation Methods.
   b. Shop Drawings/Drafts:
      a. Submit plan, section, elevation and perspective drawings necessary to describe and convey layout, profiles and 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 drawings.
      c. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.
   c. 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
   a. Product Data: For adhesives, indicating that product contains no urea formaldehyde.
   b. Laboratory Test Reports: For adhesives, indicating compliance with requirements for low-emitting materials.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that produces casework of types indicated for this Project that has been tested for compliance with SEFA.
B. Primary products furnished by a single manufacturer with documented experience in work of this Section.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery:
   a. Use pallets larger than product during storage and transportation.
   b. Package materials to prevent damage during storage, shipping and handling.
B. Storage:
   a. Store finished products in an enclosed area protected from ultraviolet.
   b. Store products in manufacturer's unopened packaging until ready for installation.
   c. Store slabs using protective dividers to avoid damage to surfaces.
   d. For horizontal storage, store slabs on pallets of equal or larger size than slab with protective layers between pallet and slabs and on top of the uppermost slab.
   e. Do not store slabs or other product vertically.
C. Handling:
   a. If protective film is provided, do not remove until slab has been installed.
   b. Handle slabs to prevent damage.
   c. Remove any product stickers or appliques immediately after installation.
   d. Protect finished surfaces during handling and installation with protective covering of polyethylene film or other suitable material.

1.7 FIELD CONDITIONS

A. Environmental Limitations: Do not deliver or install laboratory casework until building is enclosed, utility roughing-in and wet-work are complete, and HVAC system is operating and maintaining temperature and relative humidity at levels planned for building occupants during the remainder of the construction period.

B. Established Dimensions: Where laboratory casework is indicated to fit to other construction, establish dimensions for areas where casework is to fit. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.
C. Field Measurements: Where laboratory casework is indicated to fit to existing construction, verify dimensions of existing construction by field measurements before fabrication and indicate measurements on Shop Drawings. Provide fillers and scribes to allow for trimming and fitting.
D. Locate concealed framing, blocking, and reinforcements that support casework by field measurements before enclosing them, and indicate measurements on Shop Drawings.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Contract documents are based on products by American Epoxy Scientific, 500 East 16th Street, Mountain Home, AR 72653, 870-701-5015, www.epoxysci.com.
B. Substitutions are not permitted under provisions of Division 01.
C. Laboratory casework from single source from single manufacturer unless otherwise indicated.
D. Product Designations: Drawings indicate sizes and configurations of laboratory casework by referencing designated manufacturer's catalog numbers.

2.2 MATERIALS

A. Solid Epoxy Resin
   a. Products cast from modified epoxy resin ad 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.

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SEFA 3 CHEMICAL/STAIN RESISTANCE TEST RESULTS

Chemical	Method	Epoxysci-040
Amyl Acetate	A	0
Ethyl Acetate	A	0
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	0
Carbon Tetrachloride	A	0
Chloroform	A	0
Chromic Acid, 60%	B	2
Cresol	A	0
Dichloro Acetic Acid	A	0
Dimethylformamide	A	0
Dioxane	A	0
Ethyl Ether	A	0
Formaldehyde, 37%	A	0
Formic Acid, 90%	B	0
Furfural	A	0
Gasoline	A	0
Hydrochloric Acid, 37%	B	0
Hydrofluoric Acid, 48%	B	3
Hydrogen Peroxide, 28%	B	0
Tincture of Iodine	B	0
Methyl Ethyl Ketone	A	0
Methylene Chloride	A	1
Mono Chlorobezene	A	0
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	1
Silver Nitrate, Saturated	B	0
Sodium Hydroxide, 10%	B	0
Sodium Hydroxide, 20%	B	0
Sodium Hydroxide, 40%	B	0
Sodium Hydroxide, Flake	B	0
Sodium Sulfide, Saturated	B	0
Sulfuric Acid, 33%	B	0
Sulfuric Acid, 77%	B	1
Sulfuric Acid, 96%	B	3
Sulfuric Acid 77% and Nitric Acid 70%, equal parts	B	1
Toluene	A	0
Trichloroethylene	A	0
Xylene	A	0
Zink Chloride, Saturated	B	0

Testing Methodology:
The test was conducted in accordance with SEFA3 Work Surfaces, Section2.1.1 Chemical/Stain Resistance Test.
Test Method A-For volatile chemicals-A cotton ball, saturated with the test chemical, was placed in a small glass bottle (approx.1oz.). The container was inverted on the test material surface for a period of 24 hours at 73°+/-4°F.
Test Method B-For non-volatile chemicals-5 drops (1/4cc) of the test chemical were placed on the test material surface. The chemical was covered with a domed plastic cover (approx.25mm) for a period of 24 hours at 73°+/-4°F.
After 24 hours exposure, exposed areas were washed with water, then a detergent solution and finally with isopropyl alcohol. The panels were then rinsed with distilled (deionized) water and dried with a cloth. Each area of chemical exposure was numerically rated per Section 2.1.2. The panel was visually evaluated (under fluorescent lighting).
Rating:
0 No Effect – No detectable change in the material surface.
1 Excellent – Slight detectable change in color or gloss but no change in function or life of the surface.
2 Good – A clearly discernible change in color or gloss but no significant impairment of surface life or function.
3 Fair – Objectionable change in appearance due to discoloration or etch, possibly resulting in deterioration of function over an extended period of time.

2.3 COLORS

Standard Color:

Black

Regular Colors:

Charcoal Gray,
Platinum,
Gray,
Pearl,
Rock White,
Sand,
Sandstone,
Ocean Blue,
Dark Khaki and
Brite White.

2.4 ADHESIVES

First Adhesives Paragraph Below Applies to LEED 2009 for Schools

A. Adhesives: Use adhesives that meet the testing and product requirements of the California Department of Public Health's "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers."
B. Adhesives: Do not use adhesives that contain urea formaldehyde.
C. Epoxy: Factory-molded, modified epoxy-resin formulation with smooth, non-specular finish.

2.5 RETAIN "BASIS-OF-DESIGN PRODUCT"

Subparagraph and list of manufacturers below to require a specific product or a comparable product from manufacturers listed:
Subject to compliance with requirements, provide American Epoxy Scientific; Epoxy Resin material or comparable material by one of the following:

Durcon; a Wilsonart Company.
Prime Industries, Inc.

Physical Properties:

a. Flexural Strength: Not less than 10,000 psi (70 MPa).
b. Modulus of Elasticity: Not less than 2,000,000 psi (1400 MPa).
c. Hardness (Rockwell M): Not less than 100.
d. Water Absorption (24 Hours): Not more than 0.02 percent.

2.6 LABORATORY ACCESSORIES

a. Paragraphs in this article are examples only; revise to suit Project. Indicate sizes, configurations, and locations on Drawings.
b. Provide solid epoxy resin [laboratory shelving] [laboratory fume hood base work surfaces] [pegboards] where indicated.
c. Installation Materials: Manufacturer's joint adhesive, panel adhesive and sealants as required to suit project conditions and requirements.

2.7 FABRICATION

a. Fabricated tops and accessories in accordance with manufacturer's recommendations, approved Shop Drawings/Drafts and SEFA 3.
b. Epoxy Resin Work-surfaces:
1. Thickness:
a. ¼" or 6 mm
b. ½" or 12 mm
c. ¾" or 19 mm
d. 1" or 25 mm
e. 1 ¼" or 32 mm
f. 2 ½" or 64 mm

Check each sheet at manufacturer's facility for required thickness.
Maximum variation in thickness: +/- 0.03.

2. Warpage:
a. Inspect tops for warpage prior to fabrication by placing on truly flat surface.
b. Maximum allowable warpage: =/- 1/32 per running foot.
3. Fabrication:
a. Shop Floor fabrication in longest practical lengths.
b. Bond joints with highly chemical resistant cement with properties and colors similar to base material.
c. Provide 1/8" drip groove on underside of exposed edge, set back ½" from face.
d. Finish exposed edges.
4. Fabricate tops flat with ¼" raised marine edge. Flat with ¼" raised marine edge at epoxy sink location.
5. Edge treatment: 3/16" radius edge and 1/8" beveled edge.
6. Corner treatment: exposed corners shall be eased slightly for safety.
7. Curb/Back and End Splashes:

All Box curbs and loose splash is made out of the same material as the work surfaces, giving them the same chemical and physical properties. Loose splash and box curbs are a standard 4" high and 1" thick unless otherwise noted in the architect drawings. Any size can be manufactured to meet the designer's needs. Curbs will be free of saw marks and have a 1/16" beveled applied to the top sides to prevent sharp edges.

A specially formulated resin edge dressing shall be applied to all of the exposed edges giving the curbs a uniform look.

8. Joints: Work-surfaces shall be fabricated to allow for a smooth square watertight joint that can be bonded with an epoxy resin to allow for a smooth seamline.
9. Make joints between two benches level.
10. Locate joints away from sinks and over or near supports.
11. Sink cut outs: As indicated on drawings. Routed for drop in sink and under-mount sink.

c. Sinks:

All resin sinks are manufactures from the same resin material formulation as the rest of American Epoxy Scientific's resin products and meet the same chemical and physical guidelines. Sinks are molded in one piece with ½" minimum thickness. Drop in style sinks will have a lip thickness of ¼" to allow for stronger bond to the sink cut out.

Outlet sizes will all be standard 3 ½".

Detail: Sinks will have a smooth bottom that slopes 1 degree to the outlet with a 1 ½" covered radius in the bottom corners. Sinks can be modified to accept garbage disposals, fixture holes or troughs when required.

Supports: All under mount sinks should be supported as per the furniture manufacturer's guidelines.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Do not begin installation until cabinets have been installed.
B. Examine areas, with Installer present, for compliance with requirements for installation tolerances, location of reinforcements, and other conditions affecting performance of the Work.
C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean surfaces immediately before beginning installation.
B. Prepare surfaces using the manufacturer's recommended instructions.

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 all products using fasteners and adhesives appropriate for use with adjoining construction and as recommended by manufacturer.

3.4 CLEANING AND PROTECTING

A. Clean finished surfaces, touch up as required, and remove or refinish damaged or soiled areas to match original factory finish, as approved by Architect.
B. Protect countertop surfaces during construction with 6-mil (0.15-mm) plastic or other suitable water-resistant covering. Tape to underside of countertop at a minimum of 48 inches (1200 mm) o.c.

END OF SECTION 12 3653