

## LABORATORY CASEWORK SEC'

### 2.6 WORK SURFACES

#### A. Epoxy Resin Work Surface:

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1. Materials and Fabrication:
  - a. General: Material shall be a monolithic modified epoxy resin product and shall consist of a cast resin material formulated to provide a work surface with high chemical resistance characteristics. A combination of epoxy resins and inert materials, 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 shall have a uniform low-sheen surface and the finished material shall be extremely hard and resistant to scratches and abrasion.
  - b. Thickness: 1 inch (25mm) thick, unless otherwise noted on drawings. Each corner of top shall not deviate more than plus or minus 1/32 inch (1.5mm) from nominal.
  - c. Edge: Exposed edges, except as indicated, shall be furnished with a standard 1/8" chamfered or a 1/4" radius edge as specified.
  - c. Color: Black or as specified.
  - d. Warpage: Check work surface for warpage before fabrication. Measure in unrestrained condition. Work surface will be accepted for use if there is no gap exceeding 1/16" (1.5mm) in a 36" (0.9m) span.
  - e. Fabrication: Provide in longest practical lengths. All joints shall be bonded with highly chemical and corrosion resistant cement having similar properties as the base material. Provide 1/8 inch drip groove on underside of exposed edges set back 1/2 inch (12mm) from edge at all sink areas and where shown on drawings. All exposed edges to be molded or finished.
  - f. Size Tolerances: Length, plus or minus 1/8" (3mm); width, plus or minus 1/16" (1.5mm).
  - g. Squareness: Compare the diagonal corner-to-corner measurements across the width of each work surface. The diagonal measurements must be within 1/16 inch.
  - h. Penetrations: Location of cutouts and drillings: Plus or minus 1/8" (3mm). Sizes of cutout and drillings: Plus or minus 1/16" (1.5mm).
  - i. Backsplash: Materials shall be 1" (25mm) thick. Supply loose for field application in same material as countertops. Curbs as installed shall be 4 inches (102mm) high, unless otherwise indicated on drawings. Curbs will be bonded to the tops at the jobsite. Include top mounted end curb where work surfaces abut walls, fume hoods, and locations detailed on drawings.

1. Material Properties: Provide independent testing laboratory report certifying that the epoxy work surface meets or exceeds the following test criteria:

- a. 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 degrees plus or minus 2 degrees C. (73 degrees plus or minus 4 degrees 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 (25mm) for a period of no less than 24 hours at a standard temperature of 23 degrees plus or minus 2 degrees C. (73 degrees plus or minus 4 degrees F).

Evaluation Ratings:

After 24-hour exposure, exposed areas are washed with 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:

Rating:

- 1) No Effect: No detectable change in surface material.
- 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, function or life.
- 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.

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

<u>TYPE</u>	<u>Minimum Acceptable Results</u>
	<b>Black</b>
<b>Inorganic Acids – Corrosive</b>	
Chromic Acid 40%	4
Hydrochloric Acid 10%	1
Hydrochloric Acid 37%	1
Nitric Acid 40%	1
Nitric Acid 70%	1
Sulfuric Acid 60%	1
Sulfuric Acid 96%	5
<b>Organic Acids – Corrosive</b>	
Acetic Acid 5%	1
Acetic Acid, Glacial	1
Citric Acid 1%	1
Oleic Acid	1
Phenol Solution 5%	1
<b>Alkaline Solutions – Corrosive</b>	
Ammonium Hydroxide 10%	1
Sodium Carbonate Sol 20%	1
Sodium Hydroxide 60%	1
Sodium Hypochlorite Sol 4%	1
Potassium Hydroxide 15%	1
<b>Organic Solvents</b>	
Acetone	2
Benzene	2
Carbon Tetrachloride	2
Dimethyl Ether	1
Dimethyl Formamide	1
Ethyl Acetate	1
Ethyl Alcohol 95%	1
Ethylene Dichloride	1
Heptane	1
Isooctane	1
Kerosene	1
Methyl Alcohol	1
Toluene	1
<b>Organic Compounds</b>	
Aniline	1
Mineral Oil	1
Olive Oil	1
Soap Solution 1%	1
Transformer Oil	1
Turpentine	1

b. Hardness (ASTM D785):

Test Method: A steel ball under a minor load is applied to the surface of the specimen. This indents slightly and assures good contact. The gauge is then set at zero. The major load is applied for 15 seconds and removed, leaving the minor load still applied. The indentation remaining after 15 seconds is read directly off the dial (Rockwell Hardness "M" Scale).

Minimum acceptable test results: Average value of 100 over five readings.

c. Water Absorption (ASTM D570):

Test Method: Specimens measuring 3" in length by 1" in width by the thickness of the material should be used. At least 3 specimens should be tested. After weighing, specimens should be entirely immersed in distilled water maintained at a temperature of 23 degrees plus or minus 1 degree C. (73.4 degrees plus or minus 1.8 degrees 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%

d. Flammability or Rate of Burning (ASTM D635):

Test Method: The specimen is clamped at one end on a ring stand so the longitudinal axis is horizontal and the transverse axis is inclined 45 degrees to horizontal. A piece of 20-mesh Bunsen burner gauze is clamped horizontally 3/8" below the specimen. A Bunsen burner, placed so the flame contacts the end of the specimen, is held 30 seconds and then removed. If the specimen does not ignite, the burner is returned for another 30-second attempt. The burning is measured along the lower edge of the specimen. If the specimen does not ignite, it is classed non-burning by this test. If the specimen continues to burn, it is timed until it stops or a 4" mark is reached. A specimen which burns to the 4" mark is classed as burning by this test and the rate is equal to (180/time) in. per min. If the specimen does not continue burning to the 4" mark, it is classed as self-extinguishing.

Minimum Acceptable Test Results: Self-extinguishing  
Porcelain Crucible – Test A (Non-Standard Test)

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Test Method: a high form porcelain crucible, size D, 15 ml 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.

f. Heat Deflection @ 264 psi (ASTM D648)

Test Method: a bar of rectangular cross section is tested as a simple beam with the load applied at its center to give maximum fiber stresses of 455 kPa (66psi). The specimen is immersed under load in a heat-transfer medium provided with a means of raising the temperature at  $2 \pm 0.2$  degrees C/min. The temperature of the medium is measured when the test bar has deflected 0.25mm (0.010 in.). This temperature is recorded as the deflection temperature under flexural load of the test specimen.

Minimum Acceptable Test Results: 191 degrees C (375 degrees F).

g. Flexural Strength and Modulus of Flex (ASTM D790):

Test Method: Test specimens should be prepared from 1" thick 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" (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 Flex: 2,000,000 psi

## **SINKS AND ACCESSORIES SECTION:**

### **2.3 SINKS**

#### A. Epoxy Sinks:

1. Description: Integrally molded from modified thermosetting epoxy resin, and oven cured. Nominal wall thickness of 1/2 inch (12mm) with all interior corners coved to 1-1/2 inch (36mm) radius and bottoms pitched to the outlet opening.
2. Drop-In Sinks: Provide as shown on drawings:
  - a. Sink shall be installed such that the top edge of the sink is positioned 1/8" below the work surface with a 45 degree slope from the top of the worksurface to the top of the sink lip. The sink joint shall not exceed 1/8" plus or minus 1/16".
  - b. Sealant: Join work surface and sinks with a 2 part epoxy grout having similar chemical resistance and strength properties as the work surface itself.
  - c. Sink drains will be positioned per manufacturer's drawings.
  - d. Sink installation by Division 15.
3. Sink Color: Black or as specified.
4. Sink outlets:
  - a. Sink outlets shall accommodate a plastic disc strainer. Provide outlet with 1.93" outlet opening and open-end overflow standpipe. Outlet flange to be sloped and radiused to the opening for proper outlet drainage. Overflow to be at least 2" shorter than depth of sink. Installation and traps by Division 15.
  - b. Outlet Color: Black or as specified.

#### B. Cupsinks:

1. Oval Cupsinks: Provide as shown on drawings.
  - a. Oval flush mounted cupsinks shall be flush mounted. Cove inside corners and pitch bottom to integral 1-1/2" NPSM outlet with 1-1/2" NPSM threaded tailpiece.
  - f. Sink Color: Black or as specified.