

FULL DETAILED SPECIFICATION

APPENDIX 1

LABORATORY STEEL FURNITURE FINISH

MOTT MANUFACTURING LTD.

SIGMA SYSTEMS™

Revision 2, effective 19 February 2004

APPENDIX 1 - LABORATORY STEEL FURNITURE FINISH

A1 STEEL FURNITURE FINISH

.1 Preparation and Painting:

- .1 Prepare all surfaces, make free of defects with welds ground smooth and indistinguishable from surrounding metal.
- .2 Components shall be cleaned in a four-stage chemical spray process that produces an iron phosphate coating bonded to the steel surfaces. Components shall be thoroughly oven-dried before painting.
- .3 Components shall be Electro-statically coated with an epoxy/urethane powder applied in a controlled environment then baked / cured in a temperature controlled oven to assure a smooth hard finish. Surface shall be a chemical resistant, high quality laboratory grade finish. The resulting paint coating shall provide a minimum film thickness of 1.2 mils on all exposed parts and an average film thickness of 1.0 mils on all other surfaces.

.2 Physical Performance of Coatings:

- .1 Pencil Hardness: 4H minimum per ASTM D3363
- .2 Humidity Resistance: No visible effect after a 1000 hour exposure in saturated humidity at 38°C(100°F) per ASTM D2247-85.
- .3 Moisture Resistance: No visible effect caused by 93°C(200°F) +/- water trickled for 5 minutes over a test panel inclined at 45°. No visible effect caused by a 100 hour continuous application of a 21°C(70°F) water soaked 50mm x 75mm x 25mm(2" x 3" x 1") cellulose sponge that remains wet throughout the entire test period.
- .4 Salt Spray Resistance: No visible effect after a 250 hour salt spray test per ASTM B117-85.
- .5 Adhesion: Minimum of 100 squares retain finish after a test panel is scored into 100 squares 1mm x 1mm (1/16" x 1/16") by a razor blade that cuts completely through the finish with a minimum of substrate penetration and any loose particles are removed by a soft brush per ASTM D3359-90, Method B.
- .7 Adhesion and Flexibility: No peeling or cracking of finish or no metal exposure when a test sample is bent 180° once over a 6mm(1/4") mandrel per ASTM D522.

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- .8 Impact Resistance: No cracking of finish or metal exposure when a steel ball is dropped from a calibrated stand to deliver 40 inch pounds of direct impact per ASTM D2794-90.

3. Chemical Resistance Performance

.1 Test Procedure:

- .1 Test panels from two selected colors shall be tested for chemical resistance to the following list of reagents using the method outlined below. Performance shall meet or exceed the rating reported.

Place panel on a flat surface, clean with soap and water and blot dry. Condition the panel for 48-hours at $73 \pm 3^{\circ}\text{F}$ ($23 \pm 2^{\circ}\text{C}$) and $50 \pm 5\%$ relative humidity. Test the panel for chemical resistance to each chemical reagent by one of the following methods.

Method A - Test volatile chemicals by placing a cotton ball saturated with reagent in the mouth of a 1-oz. (29.574cc) bottle and inverting the bottle on the surface of the panel.

Method B - Test non-volatile chemicals by placing five drops of the reagent on the surface of the panel and covering with a 24mm watch glass, convex side down.

For both of the above methods, leave the reagents on the panel for a period of one hour. Wash off the panel with water, clean with detergent and naphtha, and rinse with deionized water. Dry with a towel and evaluate after 24-hours at $73 \pm 3^{\circ}\text{F}$ ($23 \pm 2^{\circ}\text{C}$) and $50 \pm 5\%$ relative humidity using the following rating system.

Level 0 - No detectable change.

Level 1 - Slight change in color or gloss.

Level 2 - Slight surface etching or severe staining.

Level 3 - Pitting, cratering, swelling, or erosion of coating.

Obvious and significant deterioration.

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<u>Reagent</u>	<u>Concentration</u>	<u>Rating</u>
Acetic Acid	98%	1
Acetic Acid	99.5%	1
Acetone		1
Ammonium Hydroxide	28%	0
Amyl Acetate		0
Benzene		1
Butyl Alcohol		0
Carbon Tetrachloride		0
Chloroform		1
Chromic Acid	60%	0
Creosol		1
Dichromate Acid	5%	0
Dichlor Acetic Acid		2
Dimethylformamide		1
Dioxane		1
Ethyl Acetate		1
Ethyl Alcohol		1
Ethyl Ether		1
Formaldehyde	37%	0
Formic Acid	33%	0
Furfural		1
Gasoline		1
Hydrochloric Acid	37%	1
Hydrofluoric Acid	48%	2
Hydrogen Peroxide	3%	0
Hydrogen Peroxide	5%	0
Hydrogen Peroxide	30%	0
Iodine	5% - Tincture	2
Methyl Alcohol		1
Methyl Ethyl Ketone		1
Methylene Chloride		1
Methyl Hydrate		1
Mono Chlorobenzene		1
Naphthalene		0
Nitric Acid	20%	0
Nitric Acid	25%	0
Nitric Acid	30%	0
Nitric Acid	35%	0
Nitric Acid	60%	1
Perchloric Acid	70%	0
Phenol	85%	2
Phenol	90%	2
Phosphoric Acid	75%	0
Phosphoric Acid	85%	0
Silver Nitrate	Saturated	0

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Sodium Hydroxide	Flake	0
Sodium Hydroxide	10%	0
Sodium Hydroxide	20%	0
Sodium Hydroxide	25%	0
Sodium Hydroxide	40%	0
Sodium Hypochlorite	5.25%	0
Sodium Sulfide	Saturated	0
Sulfuric Acid	25%	0
Sulfuric Acid	33%	0
Sulfuric Acid	77%	0
Sulfuric Acid	84%	0
Sulfuric Acid	85%	1
Toluene		1
Trichlorethylene		1
Uric Acid	50%	0
Xylene (Xylol)		0
Zinc Chloride	Saturated	0

.4 Colors:

- .1 Provide laboratory furniture paint finish in manufacturer's standard colors. A one or two color scheme may be used. The two color scheme is made up of one color for cabinet bodies, and one color for doors and drawer fronts.