Work Surfaces Committee Web Meeting

Thursday, March 28, 2024 - 11:00 AM EDT Time

Co Chairs - Rodney LaBelle and Harry Simmons

MEETING AGENDA

1. Approval of the November 2, 2023 Minutes

2. Review and discuss testing protocols in the current template
   a) Determine which tests would be relevant to establish Lab Grade for all material types;
   b) Determine the Pass/Fail guidelines;

SCIENTIFIC EQUIPMENT & FURNITURE ASSOCIATION

2023ANNUAL MEETING
The Omni Hotel at ChampionsGate, ChampionsGate, FL
MINUTES OF SEFA 3 – WORK SURFACES COMMITTEE
Thursday, November 2, 2023– 2:00 P.M.
Osceola Conference Center – Partin A

PRESENT:

Member Company	Representative	Signature
Diversified	John Walden	
Ed St Peter	STEM Solutions	
Water Saver	Nathan Pilon	
STEM Solutions	James Broderick	
JHC Fabrication	Matt Kussin	
FUNDERMAX	JENI ROBB	
Diversified Woodcrafts	Brant Kelly	
Kewaunee	Chris Collette	
Kewaunee	Rodney LaDelle	
Labconco	Nathan Ladd	
Kewaunee	Jeremy Miller	
DURCON	FRANKLIN HUNT	
Durcon	Keelan Jackson	
AVANTOR	ROB GALVIN	
FUNDERMAX	JONATHAN BROMAN	

Member Company	Representative	Signature
Fundermax GmbH	Hubertus Burger-Scheidlin	
CIF LAB Solutions	Lori Macleod	
Eagle MHC	Timothy Oliphant	
Eagle MHC	Kevin King	
Eagle MHC	Josh Hughes	
American Epoxy Scientific	Ben Luelf	Ben Luelf
Trespa	Jim Lewis	
Case System / CIF	Bert Bowden	
Dupont	Robert Stegeman	
LabCrafters	Scott Hegeman	
HOK	LESLIE ASHTON	
FOSENTAD	PHIL DAVOLE	
TMI	Kevin Kovash	
JHC Fabrication	Ken Mehta	
Selectech	Tom Riccardelli	

Co-Chair Dawn Jacobs called the meeting to order at 2:00 PM. Dawn welcomed everyone noting that there were a several new attendees for this meeting. Dawn reminded the committee that each member company is entitled to one (1) vote and also noted that it is very important to leave your manufacturing hat at the door, during committee meetings the idea is to work together for the greater good of the industry.

The first item on the agenda was the election of Co-Chairs. Dawn advised that in light of her recent change of role and additional commitments with her new company she would be stepping down as Co-Chair of the Work Surfaces Committee. Harry Simmons advised that he would like to remain as co-chair. Rodney LaBelle of Kewaunee Scientific was nominated from the floor. Harry and Rodney were approved as Co-Chairs.

Dawn advised that over the last few years the Work Surfaces Committee had created a template of tests both for surface characteristics and for body characteristics (copy attached). The Committee had previously voted on the testing elements to be included but was still in the process of defining what constitutes “Lab Grade” and whether or not it should be material specific. Dawn also advised that the Charts created back in 2015 by the SEFA Committee with the assistance of the Advisory Board would need to be updated, but they provide an ideal platform to use within the standard as they highlight what category of test is important to which type of lab, as well as each material that is best suited for end use. The Charts will need to be reformatted with a confirmed scoring methodology.

The Committee discussed the pros and cons of developing separate standards. Brant Kelly (Diversified) suggested it was better to keep together and not separate them out. He advised that SEFA 8 is discussing moving back to one standard. Leslie Ashor (HOK) advised that from architectural perspective they would look at the testing as a whole.

Concerns were raised that sub-committees with only one or two manufacturers could define “Lab Grade” specific to their own product capabilities; Additionally there was a concern about materials like glass that are not listed. Dawn Jacobs and Harry Simmons advised that as long as a material manufacturer tests to the SEFA 3 Standard and becomes a member they would be listed.

Dawn also reminded everyone that the SEFA Standards are living documents and additional materials could be added going forward.

Following the discussion a vote was held and it was agreed that SEFA 3 should not be separated out but should remain as a single document.

At this point Dawn thanked the Committee and handed the Meeting over to Harry Simmons.

There was a discussion about the need to have input from each material manufacturer despite the vote not to split SEFA 3 into sub-committees.

Rodney LaBelle and Harry advised that they would review all of the prior work on test methods and determine the tests that could most easily be applied to all materials. Pass/Fail values will need to be developed for each material class and presented for review and the next meeting.

At 3:00 PM the Meeting was adjourned on motion by Jim Lewis of Trespa, seconded by Kurt Rindoks and unanimously approved.

SEFA 3 Work Surfaces
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Committee Members

TBI

Foreword

SEFA Profile

The Scientific Equipment and Furniture Association (SEFA) is an international trade association comprised of manufacturers of laboratory furniture, casework, fume hoods and members of the design and installation professions. The Association was founded to promote this rapidly expanding industry and improve the quality, safety and timely completion of laboratory facilities in accordance with customer requirements.

SEFA Recommended Practices

SEFA and its committees are active in the development and promotion of Recommended Practices having domestic and international applications. Recommended Practices are developed by the association taking into account the work of other standard-writing organizations. Liaison is also maintained with government agencies in the development of their specifications.

SEFA's Recommended Practices are developed in and for the public interest. These practices are designed to promote a better understanding between designers, architects, manufacturers, purchasers, and end-users and to assist the purchaser in selecting and specifying the proper product to meet the user's particular needs. SEFA's Recommended Practices are periodically updated. The Recommended Practices are numbered to include an annual suffix which reflects the year that they were updated. SEFA encourages architects to specify these Recommended Practices as follows: "SEFA 3-2020".

SEFA Glossary of Terms

SEFA has developed a Glossary of Terms (SEFA 4-2020) for the purpose of promoting a greater understanding between designers, architects, manufacturers, purchasers and end users. The terms defined by SEFA are frequently used in contracts and other documents, which attempt to define the products to be furnished or the work involved. The Association has approved this Glossary in an effort to provide uniformity among those who use these terms. Where a specific Recommended Practice contains definitions which differ from those in the Glossary of Terms, then the definitions in the specific Recommended Practice should be used.

SEFA encourages all interested parties to submit additional terms or to suggest any changes to those terms already defined by the Association. The definitions should be used to help resolve any disputes that may arise or to incorporate the applicable terms in any contract or related documents.

SEFA Disclaimer

SEFA uses its best effort to promulgate Recommended Practices for the benefit of the public in light of available information and accepted industry practices. SEFA does not guarantee, certify, or assure the safety or performance of any products, components, or systems tested, installed, or operated in accordance with SEFA Recommended Practices or that any tests conducted under its Recommended Practices will be non-hazardous or free from risk. SEFA encourages the use of third-party independent testing where appropriate

Note : Testing as described in this document must be performed and documented by a SEFA-approved third party testing facility. See Page 36 of the SEFA Desk Reference 5th Edition Version 3.0, or visit us at SEFALABS.COM for the most current list of SEFA-approved test labs

1.0 Scope and Purpose

SEFA guidelines are intended to provide manufacturers, specifiers and users with specific information helpful in their evaluation of the safety, durability and structural integrity of laboratory casework and complementary items. While SEFA attempts to provide professionally appropriate information to manufacturers, specifiers and users, it is the sole responsibility of manufacturers, specifiers and users to determine the appropriateness of the information and interpretations of it for their use in determining which products and guidelines are appropriate for their intended uses.
The scope of SEFA 3 is limited to work surfaces, Fumehood Decks and sinks. Although SEFA attempts to be inclusive of all generic products normally used in laboratories and welcomes information about such products for inclusion in SEFA 3, SEFA does not represent that every potential product is included. The products included in this version of SEFA 3 are the following:

- **Work Surfaces**: Butcher Block, Ceramic, Epoxy Resin, HPL Compact (Solid Phenolic Compact), HPL Thin Laminate, Polypropylene, Solid Surface, Stainless Steel.
- **Sinks:** Epoxy Resin, Polyolefin, Solid Surface and Stainless Steel.
- **Fumehood Decks:** Ceramic, Epoxy Resin, HPL Compact (Phenolic), Stainless Steel

Purpose: The purpose of this document is to describe the distinguishing performance characteristics of differing materials suited for work surfaces, fume hood decks and sinks used in the laboratory. All shall be of type specifically designed and manufactured for installation and use in a laboratory.

Although aggregate test results may vary from manufacturer to manufacturer, procedures for testing performance criteria as outlined in 3.0 and each subsequent material section, the results shall be made available upon request. It is assumed that the test piece reflects the performance criteria of all 'named' products by the manufacturer. Any significant change to the material or raw materials require re-testing and if/where necessary resubmittal to SEFA. Test results will be valid for a period of five (5) years from the date the testing was performed. Furthermore, validity of 'certified' test data and those with recommended pass rates by SEFA should be updated periodically. Testing certificates should fall in line with the current SEFA RPs and if amendment has been circulated by SEFA then re testing should occur and be re-submitted to SEFA for approval.

2.0 Definitions

Acceptance Levels – The acceptance level of each performance criteria is based on the cumulative experience of actual field testing and laboratory results of SEFA members. Acceptance levels describe the expected outcome of each test procedure.

ANSI- American National Standards Institute 1819 L Street, NW Washington, DC 20036 www.ansi.or

ASTM-American Society for Testing & Materials 100 Barr Harbor Drive West Conshohocken, PA 19428-2959 www.astm.org

Counter Top – see work surface

Deflection – The movement of a structure or structural part as a result of stress or weight loads

Fume Hood Deck – also known as the fume hood base and fume hood work surface is the work surface material that a laboratory fume hood is located on and supported by a base cabinet. In the fume chamber, the surface is recessed to contain spills.

ISO – International Organization for Standardization Geneva, Switzerland ISO - International Organization for Standardization

NEMA- National Electrical Manufacturers Assoc. 1300 North 17th Street, Suite 1752 Rosslyn, VA 22209 www.nema.org

NFPA- National Fire Protection Association 1 Batterymarch Park Quincy, MA 02169-7471 www.nfpa.org Nominal Dimensions – not all surface material manufacturers produce product to identical dimensions.

NSF- NSF 769 N. Dixboro Road Ann Arbor, MI 48105-9723 www.nsf.org

Peg Board – Also known as drying rack – vertically mounted material with 'pegs' for the drying of glassware.

Permanent Damage – Destruction to material that would require repair to enable the material to be returned to its original state.

Permanent Deformation – Deflection that has exceeded the limits of the material, thus changing the original shape.

Permanent Deterioration – Erosion or corrosion of material such that the component will never return to its original appearance and or function

Permanent Failure – See 'permanent damage'

Reagent – A substance used because of its chemical or biological activity

Reagent Cap/Ledge – A surface that is provided down the middle of center tables, island or peninsulas to provide a means to support mechanical and electrical services and service fittings as needed.

Reagent Rack: A shelf or shelves, provided at the back of wall assembly or down the middle of centre tables (see Reagent Cap/Ledge) to provide storage for reagent bottles with provision made for the support of mechanical or electrical service lines and service fittings as needed.

Reasonably: When used indicates using fair and sensible methods within accepted industry standards and guidelines.

Shall – Where used, indicates a mandatory requirement.

Shelving – A horizontal surface fastened to a cabinet interior or wall.

Shelving (Cantilevered) – A flat surface fastened to a vertical support that is slotted to accept brackets that enable the shelf to be repositioned vertically.

Should – Where used indicates a recommendation.

Strength – Known as 'modulus of rupture' or 'flexural strength' and is the ultimate or breaking strength. Generally measured by fixing/laying a strip of material across two supports and applying a load between these supports. By computation the strength values can be used to determine the load-carrying ability of the material and may be used to compare strengths of different products. Data should also be provided for unsupported and supported spans.

Submersion – Covered with water

U.L.- Underwriters Laboratories 333 Pfingsten Road Northbrook, IL 60062-2096 www.ul.com

Uniformly Distributed – A force applied evenly over the area of the surface
Work Surface – also known as work top, countertop – is a horizontal surface used to support apparatus at a convenient height above the floor and/or provide the area for working at. Work surfaces are normally fixed to a base cabinet, modular system or table structure

3.0 Performance Criteria

Often Appropriate in the Selection of Work Surfaces, Fume Hood Decks and Sinks (included are specific test procedures which may be considered to assess these characteristics)

Depending on the user's needs, SEFA has identified common product performance criteria, which may be appropriate in the user's selection process along with supplier information and reputation, cost and other aspects important to users. SEFA's intent is to stimulate users to consider and define their needs and to encourage suppliers to provide information on commonly used tests in the laboratory industry to evaluate performance characteristics the user deems appropriate for its specific use.

The performance criteria is separated by the "body" – i.e. structural element and the "Surface" i.e. the element that comes into direct contact with substances and equipment. In addition, SEFA is cognizant of the differing country test methodology requirements along with the differing material test methodology requirements. With the different materials having diverse features and distinctive performance characteristics, SEFA has identified key features that have the most significant influence in determining the performance of worktops, thus making it possible to evaluate their performance with some shared methodologies.

3.1 ***Body Characteristics (structural)***

3.1.1 Density / Weight per unit of vol

3.1.2 Load Bearing Capability: (Compressive Strength, flexural Strength, Tensile Strength)

Users should consider the maximum loads that the work surface and sink will have to bear. The extent of support underneath the work surface and sink should also be included in the assessment. In addition, for adaptable systems see (SEFA 10 – 6.3 regarding the live load of shelves and 6.3.2 for work surfaces and as specified in SEFA 10. In addition, consideration of SEFA 10 6.4 for strength testing for cantilevered test procedures). (See also SEFA 10 Section)

TEST:

Compressive Strength ASTM D695 (?) (the measure of resistance to a crushing force)

Flexural Strength ASTM D790 or DIN EN ISO 10545-4 (resistance to bending stress) - Within this test element there is the breaking load applied to three points that the sample can withstand without breaking: force (f) expressed in Newtons (N)

Tensile Strength ASTM D638 (amount of pull required to break a sample of material).

3.1.3 Modulus of Elasticity

TEST:

DIN EN ISO 10545-4 or EN ISO 178

3.1.4 Dimensional Stability: (coefficient of thermal expansion)

Users should consider the range of temperatures to which the work surface may be exposed as well as the duration of the exposure, and if rapid changes in temperature may be encountered. Thus the dimensional stability becomes important. In addition, consider the impact of thermal shock. (This is also covered under Surface testing too) Thermal shock occurs when a material cracks after a rapid change from warm to cold or vice versa (e.g., use of dry ice and hot substances). Commonly used guidelines are: ASTM D648, ASTM C484, ASTM D696, ISO 10545-9 or ISO 10545-12 and EN 438.

3.1.5 Water Absorption

Users should consider the effects of moisture on the work surfaces, fume hood decks and sinks.

TEST:

24 hour submersion in tepid water – measure the % weight gain and measure the % dimensional change (thickness/width/length)

16 hour submersion in tepid water – measure the % weight gain and measure the % dimensional change (thickness/width/length)

3.1.6 Impact Resistance: (top and edge)

Top:

Users should consider the likelihood and nature of objects impacting the work surface, fumehood deck and sink.

TEST:

Measure the impact to the material by dropping a steel ball (weight and diameter to be determined) from a 2ft height. Measure the height of the rebound / the temporary indentation and/or permanent damage to the material. (although agreed need to determine A or B – Rebound or indentation)

Edge: (The Sub-Committee has not addressed this)

Users should also consider the likelihood (particularly with adaptable and mobile furniture systems) on impact to the edge of the work surface. (We need to discuss whether we want to use the SEFA 8 Edge Impact Test shown below or an alternative test methodology.)

8.8.1 Purpose of Test

The purpose of this test is to demonstrate the resilience of the 3 mm PVC edge band material.

8.8.2 Test Procedure

Insert test specimen with 3mm edge band facing the front into fixture, raise arm to stop, release arm and let it impact the sample one time.

8.8.3 Acceptance Level

There shall be no signs of damage to the 3 mm edge banding that was applied to the test specimen

3.1.7 Fire Resistance (include flammability/flame spread/ SDI etc)

Users should ascertain whether sources of flame may be encountered or if there are code requirements for the intended use. Common guidelines include ASTM E84, ISO 13501-1. The results are in classifications but also users should assess the time to ignition, flame spread and also the Smoke Developed Index.

TEST:

Laboratory Grade work surfaces should meet a minimum of Class B / Class 2
Laboratory Grade fume hood decks should meet a minimum of Class A / Class 1

Question: Should the fume hood manufacturers provide the recommended minimum SDI required?

3.1.8 Electrical Resistance (ESD: Conductive>dissipative>antistatic>insulating)

Users should consider the electrical resistance of materials used and the impact to test equipment within the lab

3.1.9 Emissions (VOC)

Users should consider the impact of emissions from the materials used – ie potential release of dangerous substances. Common guidelines can be derived from HPD (Health product declarations) GreenGuard and GreenGuard Gold certification to ensure no volatile organic compounds and/or the ISO 13501-11 which measures release of potential dangerous substances such as methanal.

3.2 Surface Characteristics

3.2.1 Chemical Resistance

Users should consider reagents that might be used on or near the laboratory work surface or sink. Common guidelines can be found by referring to: The work surface manufacturer printed data for chemical resistance. Because chemical resistance is affected by concentration, time, temperature, humidity, housekeeping and other factors, it is recommended that users test samples in their actual environment with the substances they use.

Chemical/Stain Resistance Test

The purpose of the chemical stain resistance test is to evaluate the resistance a finish has to chemical spills. Manufacturers should test a range of their dark, medium and lightest color palette (ie: Black/Grey/White). If a manufacturer's product does not have a range then none is required, but only the main product, ie., wood, butcher block etc.

Test Method A – For volatile chemicals – A virgin cotton ball, saturated with the test chemical, was placed in a one-ounce bottle (10mm x 7mm test tube or similar container). The container was inverted on the test material surface for a period of 24 hours. Temperature of test: 23° +/- 2°C (73° +/- 4°F). This method was used for the organic solvents.

Test Method B – For non-volatile chemicals – Five drops (1/4cc) of the test chemical were placed on the test material surface. The chemical was covered with a watch glass (25mm), placed concave side down, for a period of 24 hours. Temperature of test: 23° +/- 2°C (73° +/- 4°F). This method was used for all chemicals listed below other than solvents.

CHEMICAL/REAGENT	TEST METHOD	CHEMICAL/REAGENT	TEST METHOD
ACETATE, AMYL	A	IODINE, TINCTURE OF	B
ACETATE, ETHYL	A	METHYL ETHYL KETONE	A
ACETIC ACID - 98%	B	METHYLENE CHLORIDE	A
ACETONE	A	MONOCHLOROBENZENE	A
ALCOHOL, ETHYL	A	NAPTHALENE	A
ALCOHOL, METHYL	A	NITRIC ACID 20%	B
ALOCHOL, BUTYL	A	NITRIC ACID 30%	B
AMMONIUM HYDROXIDE, 28%	B	NITRIC ACID 70%	B
BENZENE	A	PHENOL, 90% (WT)	A
CARBON TETRACHLORIDE	A	PHOSPHORIC ACID 85%	B
CHLOROFORM	A	SILVER NITRATE, SATURATED	B
CHROMIC ACID - 60%	B	SODIUM HYDROXIDE FLAKE	B
CRESOL	A	SODIUM HYDROXIDE, 10% (WT)	B
DICHLORACETIC ACID	A	SODIUM HYDROXIDE, 20% (WT)	B
DICHROMATE ACID 5%	B	SODIUM HYDROXIDE, 40% (WT)	B

DIMETHYLFORMAMIDE	A	SODIUM SULFIDE SATURATED	B
DIOXANE	A	SULFURIC ACID, 33%	B
ETHYL ETHER	A	SULFURIC ACID, 77%	B
FORMALDEHYDE, 37%	A	SULFURIC ACID, 77% & NITRIC ACID, 70% EQUAL PARTS	B
FORMIC ACID - 90%	B	SULFURIC ACID, 96%	B
FURFURAL	A	TOLUENE	A
GASOLINE	A	TRICHOLOROETHYLENE	A
HYDROCHLORIC ACID 37%	B	XYLENE	A
HYDROFLUORIC ACID, 48%	B	ZINC CHLORIDE, SATURATED	B
HYDROGEN PEROXIDE, 30%	B		

Acceptance Level

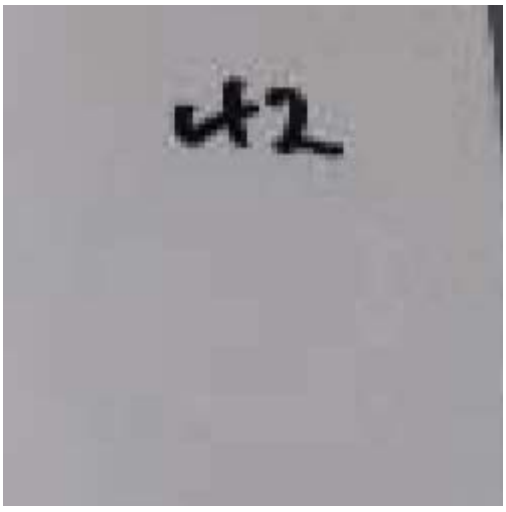
After 24-hours exposure, exposed areas were washed with water, then a detergent solution and finally with isopropyl alcohol. Materials were then rinsed with distilled water and dried with a cloth.

Following a 'rest' period of 24 hours the samples will be observed from both an overhead view ie immediately above the surface at a distance of 3ft and 45 angle at a distance of 3ft from the worksurface The observation is from eyesight.

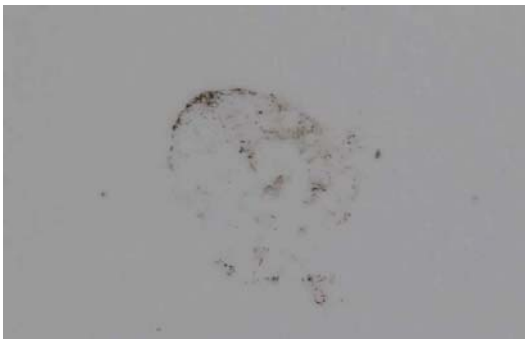
Samples are numerically rated as follows:
0 = No detectable change
1 = change in color or gloss
2 = Staining.
3 = Etching, Pitting, cratering swelling or erosion of surface. Obvious and significant deterioration.

(Insert sample images)

Level 1 (Change in color or gloss)



Level 2 (Stain)



Level 3 (Etch, Pitting, Cratering, swelling or erosion of surface)

Results will vary from manufacturer to manufacturer due to differences in composition and finish formulations and applications processes. Laboratory Grade work surface finishes shall result in no more than 4 Level 3 conditions and no more than a cumulative score of xxxx

Individual test results for the specified 49 reagents will be verified with an established and SEFA approved third-party independent SEFA 3 test submittal form. Suitability for a given application is dependent upon the chemicals used in each laboratory.

TEST REPORT

Upon achieving a passing score (xxxx) the SEFA approved third party test lab will issue a date-stamped Test Report signed by its Testing Supervisor which will include the following:

1. Completed Chemical Resistance Testing Form (see pagexxx)

2. Before and after photographs of Level 2 and Level 3 (take from a 'birdseye' / overhead view at 3FT from surface of each individual reagent square (showing the square number) with sufficient aperture and magnification for the image to be observed by SEFA) of the samples as tested, with the Chemical Reagents identified by the Test Number assigned in the chart contained in this document. The purpose

of the photographs is to merely prove that the testing was completed, and provide SEFA with the ability to analyze the test results prior to confirming acceptance and uploading to SEFALabs.com.

RE-TESTING REQUIREMENT

Test results will be valid for a period of five (5) years from the date the testing was performed. Upon expiration of the five (5) year period, the Company will be required to re-establish that their product is "Laboratory Grade" and will have a six month window within which to re-submit their product/s for testing.

3.2.2 Stain Resistance / Ease of Cleaning

Users should also consider commonly used agents that can stain work surfaces as well as the ease of which the surface can be cleaned. While a regular schedule of maintenance and housekeeping is always recommended including cleaning up spills immediately, some laboratories, e.g., those working with pathogens and radioactive isotopes, may be required to select non-porous materials and smooth surfaces for their lab work surfaces. The ASTM D1308 is a recommended cleaning test. To determine impact of cleaning agents on the surface material: Scoring will show - discoloration, change in gloss, blistering, softening, swelling, loss of adhesion, etching, watermarks, stain, and special phenomena. For Lab Grade SEFA recommends that xxxxxxx

Other common guidelines can be found by referring to the work surface manufacturer's printed data for stain resistance and cleaning guidelines as well as standardized tests such the ISO 10545-14
For lab grade SEFA recommends that the classifications for ISO 10545-14 are set as follows and results should meet at least Class 4:

Class 1: Stain cannot be removed
Class 2: Stain removed with a suitable solvent
Class 3: Stain removed with a strong cleaning agent
Class 4: Stain removed with a weak cleaning agent
Class 5: Stain removed with hot water & a damp cloth

In addition, reference should always be made to the individual manufacturers' cleaning and maintenance guidelines.

3.2.3 Abrasion & Scratch Resistance

As the lab becomes dryer and the advent of more and more computational equipment and AI – the user should identify potential uses that could cause scratching and/or wear through abrasion to the surface and/or sink. In addition, with increased cleaning cycles since the pandemic in 2020 the risk of wear on the surface is also increased. Recommended tests include:

TEST:
Question: Need decide if we want both Options and if we are including Option A, need to agree on minimum rotations. If we are keeping Option B we need to decide on pass/fail rate.

OPTION A: Abrasion Resistance: (Become a SEFA test) Taber Test utilizing a taber machine and 180 grit sand paper on the wheels, under which the sample is rotated. The number of rotations before a full circle of abrasion is seen is the 'fail' level. To gain lab grade SEFA recommends a pass rate of no less than 375 rotations.

OPTION B: Abrasion Resistance: ASTM C501 – another taber test but this time the pass fail rate is determined by weight loss following 1000 rotations

Summary of test method: Mount 4" (102mm) square specimen, attach to the spindle of the Taber Abraser and subject specimen to a prescribed number of revolutions (1000) under abrasive wheels (H-22 Coarse Calibrade wheels new or freshly dressed with a 9.8 N load to each abrasive wheel – re-weigh the specimen

The SEFA 3 Sub-Committee approved the addition of the following Test which is based on ISO 1518-1 (2023) (Ceramic) and EN 438-2 (HPL) subject to input from a SEFA-approved test laboratory:

Scratch Resistance: OPTION A: (Become a SEFA Test) A diamond tip/ stylus is used with varying weight loas (1 N > 6N) and rotated on the surface. Once a complete circle scratch is made and the mark cannot be removed it is measured by the weight load used to create. A lab grade surface pass rate should see the permanent scratch at EACH MATERIAL NEEDS TO DECIDE

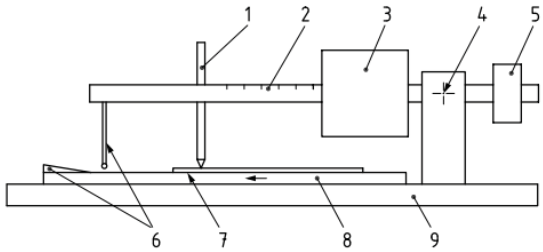
Scratch Resistance: Option B

Detail from ISO 1518:

The test load acting on the scratch stylus fixed to the load beam can be produced by a weight which slides along a graduated load beam— The test load shall be 1 N to 20 N, shall be adjustable in increments of 0,5 N and shall be accurate to within 0,2 N. — The test panel held in a panel holder is moved relative to the stylus by means of a linear actuator driven by a motor. The speed at which the stylus travels shall be (35 ± 5) mm/s and the length of the scratch shall be at least 40 mm. The length of the scratch can affect the result. — A lowering device with a flat ramp brings the stylus smoothly into contact with the coating at the beginning of the movement of the panel holder. The angle of the ramp shall be (12,5 ± 2,5)°. Some types of apparatus are designed so that the load beam moves and the test panel is fixed. Such types of apparatus may also be used.

Scratch stylus A, having a hemispherical hard-metal tip of diameter (3,00 ± 0,01) mm

1 stylus
2 load beam with scale
3 sliding weight
4 pivot bearing for load beam
5 tare weight
6 lowering device (ramp and guide pin)
7 test panel
8 test panel holder (designed to be driven by a motor to move in the direction of the arrow)
9 baseplate



3.2.4 Bacterial Resistance

Users should consider the importance in the use of the work surface and sink and its ability to resist, support or promote bacterial growth and how the material used can be decontaminated or disinfected. TEST:

ASTM E1428 – Staining by streptomyces

0 = No Stain
1 = Trace of stain (less than 10% coverage)
2= Slight Stain (10-30% coverage)
3= Moderate Stain (30-50% coverage)
4=Heavy Stain (50% - complete coverage)
SEFA recommends that results should be no greater than 1.

3.2.5 Heat / Cold Resistance & Thermal Shock

Users should ascertain the range of temperatures as in the body element above – but also the impact to the surface. Heat may cause blisters, cracks and permanent breakdown of the surface. A common measure for long-term and short-term heat resistance is the ability to withstand 180°F and 360°F without discoloration or blistering.
Common tests include:
ISO 110545-9 or 10545-12 – for high temperature; extreme temperature (1150-1250 ^{o}C)
SEFA also recommends the following tests:

Hot Crucible test:
1) Heated to 360°F and placed on the surface. Record the number of minutes before a blister/non-removable mark / scorch appears on the surface.
2) Heated to 475°F and placed on the surface. Record the number of minutes before a blister/non-removable mark / scorch appears on the surface.
SEFA recommends that result should be greater than xxx minutes

Bunsen Burner/Naked Flame Test:
Place a Bunsen Burner at a 180 degree angle ensuring the blue cone of the flame is on the surface of the material. Record the number of seconds prior to any surface scorching/blistering
SEFA recommends that result should be greater than xxx seconds

Thermal Shock

Question: Do we want to adopt the ASTM C484-20 or simplify it by creating our own test based on that; and do we need to create a pass/fail?

Summary of C484: Thermal shock resistance is determined by cycling a sample ten times between temperatures of 15 +/-5 oC (59 +/- 9oF) and 145 +/- 5 oc (293+/- 9oF) This test includes two procedures, with and without immersion. For (ceramic) with a water absorption less than or equal to 10% and with a water absorption greater than 10% respectively. After completing ten cycles, the material is inspected for any damage as a result of the cycling.

Option B: Create a SEFA Test…..

3.2.6 Hot Water Test

Purpose: The purpose of this test is to ensure the surface/coating is resistant to hot water.

Procedure: Hot water (190oF to 205 oF [88oC to 96oC] shall be allowed to tickle with a steady stream at a rate of not less than 6 ounces [177.44cc] per minute – onto the finished surface, which shall be set at an angle of 45o for a period of five minutes.

Acceptance Level: After cooling and wiping dry, the surface/finish shall show no visible effect from the hot water.

3.2.7 UV Resistance

Users should consider the impact to UV exposure on the life of the material and consider fade and deterioration / breakdown of the surface to ensure safe working practices and not just aesthetic value. Common test methodologies include: ISO 10545-16 and EN 438.

SEFA recommends a minimum level 4 and/or no visible difference. (Needs to be agreed)

Once user needs are defined, appropriate information may be requested from suppliers. Other criteria may also be appropriate to a given laboratory user and such information should be requested of suppliers when needed. Common tests are stated for screening work surface and sink products dependent upon the user need (criteria which is important to the user in their lab environment). In addition to requesting test results from suppliers appropriate to the user need, users should understand the validity and reliability of the test method and data and whether such data is merely “representative” or “certified” and what, if any warranty is given by the supplier.

Where identified, the acceptance levels are based on the cumulative field experience and laboratory testing of SEFA members based on actual needs of laboratories. This is a performance-based document. Specifications detailing specific materials may or may not meet acceptance levels of this document. If listed materials of the specifications conflict with compliance of this document then the Architectural prescribed elements should take precedent.

4.0 Subcategories – by Material Type

The different materials have been split into subcategories to help users, lab planners and designers identify which materials are suited by application (work surface, fumehood top, sinks) for each laboratory type.

4.1 Butcher Block / Edge Grain Hardwood
To insert
4.2 Ceramic
4.3 Epoxy Resin
4.4 HPL Compact (Phenolic Compact)
4.5 HPL Thin Laminate
4.6 Polypropylene
4.7 Solid Surface
4.8 Stainless Steel

5.0 Fabrication

5.1 Fabricated Work Surfaces, Fumehood Decks and Sinks

Guidelines should be provided by fabricator as to how to receive shop drawings to ensure accurate fabrication. Fabricators should also have a minimum 5 years of experience and be 'qualified' by the material manufacturer in best practice of fabrication.

5.2 Fabricated Work Surfaces Guidelines for Tolerance (prior to installation)

Guidelines prior to installation shall be in accordance with fabricator's standards. Color, Texture, Finish, Edge Detail and Drip Groove: See individual manufacturer's guidelines for a detailed description. It is further suggested that before specifying any material, samples be obtained and approved

6.0 Sinks, Cupsinks and Special Use Sinks for Laboratories

6.1 It is recommended that all sinks for laboratory use shall be provided with a drain outlet measuring no less than 1-1/2" diameter. Drain fittings shall conform to ANSI 124.6 sec 4.1.1 connection test

6.2 Laboratory sinks shall be fabricated to have an internal basin fall of no less than one degree to allow for proper draining

6.3 The laboratory sinks shall have a load bearing capacity of 1-1/2 times the maximum volume of water weight that the sink can hold. A gallon of water is 231 cubic inches and is 8.3 pounds

6.4 Sinks shall be provided with a plug and strainer, overflow that is either integral with inlet located two inches below the top of the sink and back flow preventer, or with a standpipe overflow terminating two inches below the top of the sink (Exclude cupsinks, people ask for stoppers and a cupsink is a disposal sink)

6.5 Sink support and mounting shall be per manufacturer's recommendations and those of the casework manufacturer's recommendations. Appropriate sealant as specified or recommended by the SEF supplier shall be used at the joint between the work surface and sink bowls, typically silicone RTV sealant, or epoxy cement. Under counter installations of epoxy, polyolefin or other sink bowls shall

include supportive means other than the sealant as recommended by the SEF supplier. As per installation RPs

6.6 ADA requirements Refer to ADA section of recommended practice.

6.6.1 When installing sinks at ADA locations consideration should be given to sink outlet (drain) location. Using a sink with a corner drain often facilitates ease of trap installation, as opposed to the center drain type, and keeps the plumbing out of the way of the user

The Americans with Disabilities Act (ADA)(9PL 101-336) requires handicap areas of laboratories to have an ADA compliant sink within the wet laboratory.

A. Americans with Disabilities Act (ADA) Drop-In Sinks are shallow basin Drop-In Sinks with corner drains. This design maximizes under sink space to help meet ADA requirements.

B. The U.S. Department of Justice's Americans with Disabilities Act home page http://www.usdoj.gov/crt/ada/adahom1.htm lists sink area compliance as:

1. 4.24.2 Height. Sinks shall be mounted as a drop-in into a rabbeted recessed cutout in the counter top, with the counter or rim no higher than 34 in (865 mm) above the finish floor.

2. 4.24.3 Knee Clearance. Knee clearance that is at least 27 in (685 mm) high, 30 in (760 mm) wide, and 19 in (485 mm) deep shall be provided underneath sinks.

3. 4.24.4 Depth. Each sink shall be a maximum of 6-1/2 in (165 mm) deep.

4. 4.24.5 Clear Floor Space. A clear floor space at least 30 in by 48 in (760 mm by 1220 mm) complying with 4.2.4 shall be provided in front of a sink to allow forward approach. The clear floor space shall be on an accessible route and shall extend a maximum of 19 in (485 mm) underneath the sink.

5. 4.24.6 Under mounting of sinks. Under counter mounted sinks need to be supported on the underside. The support depth has to be figured into the knee clearance.

Note: State and Local ADA Requirements override federal statutes.

7.0 Recommended Storage, Handling and Installation Guidelines

7.1 Storage and handling: Refer to and request a copy of the specific manufacturer's storage and handling guidelines.

7.2 Installation: Refer to Current SEFA 2 Installation Recommended Practices.

8.0 Protection, Care and Maintenance of Work Surfaces and Sinks

8.1 Protect surfaces and sinks prior to and during installation

Never allow tradesmen to walk on work surfaces or use them as a workbench or scaffolding, etc. Supplier is not responsible for damage to surfaces or sinks from tradesmen after installation and before acceptance. Ideally work surfaces should be provided with a protective film/peel coat that is removed after installation and prior to final walk through.

8.2 Care and Maintenance of Laboratory Work Surfaces and Sinks

A regular schedule of cleaning and maintenance is the most effective means to prolong the surface life and attractiveness of all laboratory work surfaces and sinks for many years. Consult the supplier for suggested cleaning methods

8.3 Reagents

Do not allow reagents to remain in contact with the work surface or sink longer than necessary. Clean up spills immediately and follow manufacturer's recommended 'housekeeping' guidelines.

8.4 Removal of stains

The supplier should provide a maintenance 'manual' for the surface with manufacturer's recommendations on removal of stains.

8.5 Extreme Temperatures

Avoid exposing work surface or sink to extreme temperatures or extreme changes in temperature. See manufacturer's recommendations for acceptable hot and cold temperature

9.0 Sustainability

SEFA is committed to sustainability; to that end it is recommended that minimization of waste to reduce disposal problems be a priority. Some ways of doing this is by minimizing packaging, blanket wrapping of product is one method as is utilization of returnable skids and pallets. (See installation Guidelines)
Use of recyclable products will also reduce the number of items going to local landfills and those that have extended longevity.

Also consider use of recycled content in the finished product. It is also recommended that manufacturer's provide transparency in relation to sustainable manufacturing and information can be obtained through documents such as EPDs (Environmental Product Declarations) and Corporate Sustainability Statements.