



## Technical Data Chemical Resistance



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## 1. Manufacturer

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## 2. Product Description

### Recommended Uses:

Korlux™ flexible stone veneer is a multi-purpose surfacing material that can be used for work tops, shelf and cabinet surfacing in intermediate-type laboratories where weight or cost constraints rule out slate, epoxy, solid phenolic or stainless steel; the possibility of chemical spills or staining rules out conventional high-pressure decorative laminate; or where a trend-aware surface is desired. Korlux™ is also recommended in areas where indiscriminate use of a variety of cleaning agents may be used or where extreme impact and/or abrasion resistance are desirable traits.

Specific applications include laboratory cabinets, reagent shelves, casework, counters and tabletops in hospitals, photographers' darkrooms, beauty salons and product testing facilities. Korlux™ is ideal for nurses' stations, physicians' and dentists' examining and treatment rooms and pathologists' work rooms. It is also a practical and attractive surfacing for wainscoting in any of these areas.

Korlux™ may be used for horizontal, vertical and postforming surfaces and applications, including those where it is necessary or desirable to roll the veneer on a simple radius over the edge of a substrate. This eliminates seams, which are otherwise vulnerable to chemical attack. Korlux™ can be cold-formed to a 3/4" radius and heat-formed to a 1/8" radius.

Product Composition: The resin formulation used in the manufacture of Korlux™ is chemical resistant and does not require the application of a separate chemical resistant surface coating. As a result, scratches and wear will not defeat the chemical resistance of the sheet as is typical of chemical resistant laminates.

### Basic Limitations:

Korlux™ flexible stone veneers are intended for interior surfacing only, and not as structural materials. They must be bonded to suitable substrates.

Do not subject Korlux™ to temperatures over 300°F (149°C) for sustained periods of time.

You should not expose Korlux™ to flame, molten metal, metallic sparks or intense, direct sunlight. Korlux™ should not be used as a cutting surface.

Note: Korlux™ should be protected from damage caused by high heat, such as heat created by Bunsen burners. The burners should be placed on a trivet to protect the surface.

Pattern and Color Availability: Korlux™ is available in six granite colors: K01-Lunar, K02-McKinley, K03-Midnight, K04-Aurora, K05-Beach, and K06-Amber Coast.

Finishes: Korlux™ standard matte finish offers a slight sheen.

Available Product:

| Thickness      | Sheet Size            |
|----------------|-----------------------|
| 0.035"         | 49" x 97", 61" x 145" |
| 0.050", 0.090" | Special Order         |

**3. Technical Data**

| Test                                 | Test Method        | Test results                                 |
|--------------------------------------|--------------------|--|
| Light Resistance                     | NEMA LDS-2005 3.3  | No effect                                    |
| Cleanability                         | NEMA LDS-2005 3.4  | 9  |
| - Reagents 1-10                      | NEMA LDS-2005 3.4  | No effect                                    |
| - Reagents 11-15                     | NEMA LDS-2005 3.4  | No effect                                    |
| Boiling Water Resistance             | NEMA LDS-2005 3.5  | No effect                                    |
| High temperature resistance          | NEMA LDS-2005 3.6  | Severe effect                                |
| Scratch Resistance                   | NEMA LDS-2005 3.7  | <100g  |
| Ball impact resistance               | NEMA LDS-2005 3.8  | >3000 mm (min)                               |
| Dart Impact Resistance               | NEMA LDS-2005 3.9  | >1100 mm (min)                               |
| Radiant Heat resistance              | NEMA LDS-2005 3.10 | 49 sec. (min)                                |
| <u>Dimensional Change</u>            |                    |  |
| Machine direction - %                | NEMA LDS-2005 3.11 | 0.08   |
| Cross direction - %                  | NEMA LDS-2005 3.11 | 0.03   |
| <u>Room Temp. Dimensional Change</u> |                    |  |
| Machine direction - %                | NEMA LDS-2005 3.12 | 0.01   |
| Cross direction - %                  | NEMA LDS-2005 3.12 | 0.17   |
| Wear Resistance - cycles             | NEMA LDS-2005 3.13 | 14850  |
| Weatherability                       | ASTM D2565-99      | $\Delta E < 2$ in 500 hours                  |
| Thermal Expansion                    | ASTM D-696         | $3.8 \times 10^{-5} \text{ } ^\circ\text{C}$ |
| Flexural Modulus (psi)               | ASTM D-790         | 335,000                                      |
| Flexural Strength (psi)              | ASTM D-790         | 313,000                                      |
| Tensile Strength (psi)               | ASTM D-638         | 3,713  |
| Tensile Modulus                      | ASTM D-638         | 375,000                                      |
| Tensile Elongation                   | ASTM D-638         | 4.10%  |
| Gardner Impact                       | ASTM D-3029        | 50 in lbs (min)                              |
| Notched Izod Impact                  | ASTM D-256         | 3.5  |
| Specific Gravity                     |                    | 1.1  |
| Water Absorption, Base Layer *       | ASTM D-570         | 0.03%  |
| Water Absorption, Top Surface        | ASTM D-570         | 0.00%  |
| Hardness - Shore D                   |                    | 70   |
| Colorfastness and Aging              | ASTM D2565         | $\Delta E < 2$ in 500 hours                  |
| Chemical Spot Test <sup>†</sup>      | SEFA 8.1           | Conforming                                   |
| Flame Spread                         | UL 94-HB           | V3   |

<sup>†</sup>For a complete list of acids, bases, solvents, and reagents used in the SEFA 8.1 test, please refer to page 4.

\* Water absorption in the base layer of the co-extruded sheet facilitates adhesion with PVA adhesives. The decorative, chemical resistant top layer does not absorb water.

Certifications:

Korlux™ flexible stone veneer is a co-extruded polymer with a minimum 25 mil thick chemical resistant and decorative surface layer. Korlux™ conforms to typical standards of ANSI/NEMA LD3-2005 for HGL horizontal general purpose laminate. At present, there is no general industry standard for a high-pressure, chemical-resistant laminate.

Scientific Equipment & Furniture Association SEFA No. 8.1 approved.

Korlux™ does not support microbial growth.

**4. Scientific Equipment and Furniture Association (SEFA) Chemical Spot Test**

Per the Recommended Practices of SEFA, Korlux™ was submitted to an independent lab to perform the SEFA 8.1 Chemical Spot Test. Results follow.

**Acids**

|   |                         |           |    |   |           |
|---|-------------------------|-----------|----|---|-----------|
| 1 | Acetic Acid 98% Glacial | No Effect | 7  | Nitric Acid 20%, 30%, 70%                         | No Effect |
| 2 | Acid Dichromate 5%      | No Effect | 8  | Phosphoric Acid 85%                               | No Effect |
| 3 | Chromic Acid 60%        | No Effect | 9  | Sulfuric Acid 33%, 77%, 96%                       | No Effect |
| 4 | Formic Acid 90%         | No Effect | 10 | Sulfuric Acid 77% / Nitric Acid 70% - Equal Parts | No Effect |
| 5 | Hydrochloric Acid 37%   | No Effect |    |   |           |
| 6 | Hydrofluoric Acid 48%   | No Effect |    |   |           |

**Solvents**

|    |                      |           |    |                     |           |
|----|----------------------|-----------|----|---------------------|-----------|
| 11 | Acetone              | No Effect | 22 | Formaldehyde 37%    | No Effect |
| 12 | Amyl Acetate         | No Effect | 23 | Furfural            | No Effect |
| 13 | Benzene              | No Effect | 24 | Methyl Alcohol      | No Effect |
| 14 | Butyl Alcohol        | No Effect | 25 | Methyl Ethyl Ketone | No Effect |
| 15 | Carbon Tetrachloride | No Effect | 26 | Methylene Chloride  | No Effect |
| 16 | Chloroform           | No Effect | 27 | Mono Chlorobenzene  | No Effect |
| 17 | Cresol               | No Effect | 28 | Naphthalene         | No Effect |
| 18 | Dimethylformamide    | No Effect | 29 | Phenol 90%          | No Effect |
| 19 | Ethyl Acetate        | No Effect | 30 | Toluene             | No Effect |
| 20 | Ethyl Alcohol        | No Effect | 31 | Trichloroethylene   | No Effect |
| 21 | Ethyl Ether          | No Effect | 32 | Xylene              | No Effect |

**Bases**

|    |                              |           |    |                          |           |
|----|------------------------------|-----------|----|--------------------------|-----------|
| 33 | Ammonium Hydroxide 28%       | No Effect | 35 | Sodium Hydroxide, Flake  | No Effect |
| 34 | Sodium Hydroxide 10%,20%,40% | No Effect | 36 | Sodium Sulfide Saturated | No Effect |

**General Reagents**

|    |                           |           |    |                          |           |
|----|---------------------------|-----------|----|--------------------------|-----------|
| 37 | Gasoline                  | No Effect | 40 | Tincture of Iodine       | No Effect |
| 38 | Hydrogen Peroxide 3%      | No Effect | 41 | Zinc Chloride, Saturated | No Effect |
| 39 | Silver Nitrate, Saturated | No Effect |    |                          |           |

Test procedure: The SEFA 8 PL-2007 Chemical Spot Test was performed by Intertek, 4700 Broadmoor SE, Suite 200, Kentwood, MI 49512 (616-656-7401). The listed materials were placed in contact with Korlux™ flexible stone veneer for a period of one hour. The test sample was then washed, cleaned, rinsed with deionized water and dried with a towel. The sample was evaluated 24 hours later.

### **Additional Reagents (Not included in SEFA 8.1)**

|    |                      |                  |    |                       |                  |
|----|----------------------|------------------|----|-----------------------|------------------|
| 1  | #2 Pencil            | No Effect        | 13 | Isopropyl Alcohol 90% | No Effect        |
| 2  | Acetone              | No Effect        | 14 | Lye Solution 1-2%     | No Effect        |
| 3  | Ammonia              | No Effect        | 15 | Naptha                | No Effect        |
| 4  | Ball Point Ink Pen   | No Effect        | 16 | Permanent Marker      | Moderate Effect* |
| 5  | Black Shoe Polish    | Moderate Effect* | 17 | Pine Oil              | No Effect        |
| 6  | Catsup               | No Effect        | 18 | Providone 10%         | No Effect        |
| 7  | Citric Acid 10%      | No Effect        | 19 | Tea                   | No Effect        |
| 8  | Distilled Water      | No Effect        | 20 | Vegetable Oil         | No Effect        |
| 9  | Ethyl Alcohol 90%    | No Effect        | 21 | Vinegar               | No Effect        |
| 10 | Fingernail Polish    | No Effect        | 22 | Wax Crayon            | No Effect        |
| 11 | Hydrogen Peroxide 3% | No Effect        | 23 | Yellow Mustard        | No Effect        |
| 12 | Instant Coffee       | No Effect        |    |                       |                  |

\* Shoe polish and permanent marker are easily removed with acetone.

### **5. Fabrication and Assembly Recommendations**

Korlux™ flexible stone veneer must be bonded to a substrate of reliable quality and appropriate fire rating, such as particleboard, incombustible cement board or plywood with one A face. Bond with adhesives, and follow the techniques recommended by the adhesive manufacturer. Permanent adhesives are recommended. Specialized PVAs (e.g.: Forbo 49111, Titebond® Elmer's® Glue-All), epoxy or contact cement (e.g.: Wilsonart® 500 and 801 or 3M™ Fastbond 30-NF) may be used.

The substrate should be balanced with a high-pressure phenolic laminate sheet as a backer, to reduce warping and to provide additional protection to the substrate against chemical attack from condensing fumes and runoff.

Take care to ensure an appropriate acclimation balance between the veneer and the substrate prior to fabrication. The face veneer and backing laminate and the substrate should be conditioned in the same environment for 48 hours before fabrication.

Recommended conditioning temperature is about 75°F (24° C) at 50% relative humidity.

To avoid stress cracking, do not use square-cut inside corners. All inside corners should have a minimum of 1/8" (3.18mm) radius, and all edges should be routed smooth.

#### **Methods**

Assembled pieces should meet KCMA (Kitchen Cabinetmakers Manufacturers Association), ANSI-161.2-1998 specifications. Drill oversized holes for screws or bolts. Screws or bolts should be slightly countersunk into the face side of a veneer-clad substrate.

Korlux™ sheets should be cut oversize prior to layup, using a carbide-tipped saw as described in American National Standards Institute/National Electrical Manufacturers Association (ANSI/NEMA) LD3-2005, Annex A. After bonding, veneer should be machined flush on all edges.

**Postforming:** Postforming is the preferred edge treatment for counters vulnerable to repeated chemical attack. Korlux™ provides excellent chemical and stain resistance as stated herein and postformed edges protect the surface from chemicals accumulating in the seam. Korlux™ sheets may be formed successfully with conventional postforming machinery. Korlux™ may also be cold-formed to a 3/4" radius.

***Refer to the Korlux™ Handling and Fabrication guide for more complete details.***

## **6. Warranty**

Bordener Engineered Surfaces warrants that, under normal use and service, the material and workmanship of its product shall conform to the standards set forth herein for a period of one (1) year from the date of sale to the first consumer purchaser.

In the event that the product does not perform as warranted, the first consumer purchaser's sole remedy shall be limited to refund of the purchase price or repair or replacement of all or any part of the product which is defective, at the manufacturer's sole discretion.

This warranty applies only to product:

1. In its original installation; and
2. Purchased by the first consumer purchaser.

This warranty is not transferable, and expires upon resale or transfer by the first consumer purchaser. This warranty shall not apply to defects or damage arising from any of the following:

1. Accidents, abuse or misuse;
2. Exposure to radiant heat and/or contact with objects in excess of 180 F°;
3. Cutting and/or chopping directly on the product surface;
4. Improper fabrication or installation; or
5. Improper maintenance.

NO OTHER WARRANTIES, EXPRESS OR IMPLIED, ARE MADE, INCLUDING MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. UNDER NO CIRCUMSTANCES SHALL BORDENER ENGINEERED SURFACES INC. BE LIABLE FOR ANY LOSS OR DAMAGE ARISING FROM THE PURCHASE, USE OR INABILITY TO USE THIS PRODUCT, OR FOR ANY SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES. NO FABRICATOR, INSTALLER, DEALER, AGENT OR EMPLOYEE OF BORDENER ENGINEERED SURFACES INC. HAS THE AUTHORITY TO MODIFY THE OBLIGATIONS OR LIMITATIONS OF THIS WARRANTY.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state; therefore, some of the limitations stated above may not apply to you. It is to your benefit to save your documentation upon purchase of a product.

## **7. Maintenance**

Clean the TOP SURFACE with a soft cloth or sponge using soap and water or most normal household cleaning agents. You can use ammonia, bleach, abrasive cleaners or pads, or solvents for very tough stains or marks. Mr. Clean Magic Eraser® works extremely well as a surface cleaner.

In most cases, minor scratches or abrasions may be removed with a #7445 (white) ScotchBrite® pad. For more aggressive repair, begin sanding with a minimum 220 grit sandpaper and work through finer grades or equivalent ScotchBrite® pads. Finishing with the #7445 (white) ScotchBrite® pad will restore the surface to its original matte finish.

Please visit [www.bordener.com](http://www.bordener.com) to download our complete Handling and Fabrication Guide.

## **8. Customer Service**

For samples, literature, questions or technical assistance, please call 989-835-6881, Monday through Friday, 9 am to 5 pm, EST.



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