
Fabricator Survival Guide

Read Immediately to Avoid an Emergency

richlite

Welcome to Richlite Company, a manufacturer of architectural and design surfaces that are truly in a class of their own. Durable, aesthetically appealing Richlite surface is a material made of paper composite ideal for countertops, paneling, wainscoting and numerous architectural applications. The following Richlite Fabricator Survival Guide answers a broad range of questions regarding design, performance, environmental benefits, fabrication and technical information. We're confident our unique surface material will satisfy your client's design tastes and fulfill your technical queries. If you have further questions, we encourage you to visit www.richlite.com or contact your regional distributor. We genuinely appreciate your interest in Richlite surfaces.

Sincerely,

Richlite Company

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HISTORY

Established in 1943, Richlite Company, based in Tacoma, Washington, started producing natural fiber composites for aerospace and industrial markets in the late 1950's. The material was used for tooling purposes by Boeing and later adopted by the marine industry as a boat building material.

Richlite has been used for food prep surfaces in commercial kitchens since the 1960's. Sales on the commercial food side of the business continue to flourish due to the surface's sanitary properties and low maintenance requirements.

In the 1990's Richlite introduced a similarly produced product called Skatelite®, a ramp surface material used in the world's top skateparks, extreme sports events and by the top professional BMX riders and skateboarders on their personal ramps.

Attractive, versatile, durable: Richlite products look great and perform well under the toughest conditions whether used for industrial, recreational or culinary purposes.

SUSTAINABILITY

For 65 years Richlite Company has been devoted to producing a quality product that is aware of the environment it is produced in. Our company will always be committed to improving our sustainable practices while never sacrificing quality.

WASTE-TO-ENERGY (WE™) TECHNOLOGY

During manufacturing, the waste from processing our raw materials is converted into energy used to sustain our heating system. This occurs during the paper saturating process where we now use 83% less fuel. Our innovative WE™ manufacturing design captures solvents left over from the manufacturing process and recycles it back as energy into our heating system. Traditional RTO horizontal saturating lines emit four to five times the amount of CO₂ as Richlite's new WE™ manufacturing system.

CARBON FOOTPRINT

Richlite began tracking emissions in 2005 using the Greenhouse Gas Protocol (GHG Protocol), which was developed through a partnership between the World Resources Institute and the World Business Council for Sustainable Development. Richlite has made great strides in reducing carbon emissions, however, we continually review our three different scopes of emissions. We developed our WE™ manufacturing system which will greatly help reduce emissions from the factory. The greatest part of our current emissions, however, comes from Scope 3 – specifically out-bound freight, where we have taken the first step of using only Smartway Transport Partnership carriers to reduce emissions.

SUSTAINABLE MATERIALS

All Richlite materials are made either with FSC® Certified or post-consumer waste recycled paper. The non-recycled products utilize fibers from the rapidly renewable eucalyptus tree. r50 uses 50% Old Corrugated Cardboard (post-consumer waste) and r100 uses 100% recycled FSC® Certified paper. FSC® is a global non-profit organization devoted to encouraging the responsible management of the world's forests. FSC® sets high standards that ensure forestry is practiced in an environmentally responsible, socially beneficial, and economically viable manner. See Richlite's FSC® Certificate at fsc.org.

LEED®

Richlite's sustainable manufacturing and LEED® credit information:

MR Credit 3: Materials Reuse

Durability is a primary attribute of Richlite. Richlite will last a lifetime – whether it stays in its original installation or is re-fabricated into another project. Richlite can be easily refinished to its original appearance.

MR Credit 4: Recycled Content

Richlite r50 product contains 50% of fibers from post consumer waste. Richlite r100 product contains 100% of fibers from post consumer waste and is also FSC® Certified.

MR Credit 5: Regional Materials

Richlite products are manufactured in Tacoma, Washington. Richlite's r50 and r100 paper suppliers and Richlite's resin supplier are within 200 miles of the manufacturing plant.

MR Credit 6: Rapidly Renewable Materials

Richlite FSC® Certified products are composed of 30% Eucalyptus fibers. Richlite FSC® Certified products can be applied to both MR Credit 6 (rapidly renewable materials) and MR Credit 7 (certified wood) below.

MR Credit 7: Certified Wood

Use a Richlite FSC® Certified product and apply it to two points, not just one. 30% of Richlite's FSC® Certified product uses eucalyptus fibers (a rapidly renewable material under MR Credit 6).

IEQ Credit 4.4: Low-Emitting Materials: Composite Wood & Agrifiber Products

Richlite contains no urea formaldehyde. In addition, all Richlite products are GREENGUARD Certified for Children & Schools – the highest rating GREENGUARD supplies. Also note that 100% of the VOC's created during manufacturing are destroyed.

ID Credit 1: Innovation in Design

Richlite has seen its material used in some very unique and sustainable ways in building projects. Richlite will provide the form... you provide the function.

RICHLITE ATTRIBUTES

PATINA & AGING

Over time and with use, Richlite will develop a seasoned appearance that is characteristic of the material. There will be more luster or burnishing in areas of heavier use. Overall it will appear softer and deeper in color and pattern.

Aging is a natural process that begins immediately and, like cherry and mahogany, may take a number of years to complete. It is similar to the manner in which natural wood products oxidize and age over time. The speed of aging will be effected by amount of natural light the product is exposed to. Typically the process is noticeable after one to three months.

The effect of aging in Richlite is primarily a result of the resin component, which begins as pale amber and deepens to a rich shade of sienna. It is strongly recommended the difference in color be shown to the customer prior to purchase.

The color of Richlite is the result of the combination of the paper color used and the color of the resin. No dyes are added in the manufacturing process. As they age, Richlite colors darken, become richer, warmer and more dramatic. In general, color change is least noticeable in darker colors & more pronounced in lighter colors. The manufacturing process does not allow absolute control over the color of the final product. Slight variations between sheets will occur, but will lessen as they age.

COLORS

Richlite is available in the following colors: Chocolate Glacier, Browns Point, Yellow Island, Blue Canyon, Green Mountain, Redstone, Black Diamond, r50 and r100.

- r100 & Baguette: Since the paper color is neutral, the color you see is purely a result of the resin. It first appears a pale, amber color and over time will darken to sienna, similar to an old fir floor.
- Yellow Island: Similar to Baguette and r100 but lighter and more yellow in color. These colors are not recommended in locations subject to standing water as water marks may be visible.
- Green Mountain: Begins a cool green-blue and develops into a warm, olive green.
- Redstone: Appears as a deep wine red at first, darkening slightly while becoming warmer.
- Blue Canyon: First appears as a dark cobalt blue and darkens toward navy, eventually becoming almost black.
- r50 & Browns Point: Start as a medium brown, aging into a warmer, honey-brown.
- Chocolate Glacier: Darkens to rich brownish-black.
- Black Diamond: No change.

STRIATIONS

Richlite has a “mottled” appearance, which patterns in a striated effect lengthwise. This is less apparent, but present on dark colors, including Black Diamond. This quality is due to the natural variation in the way fibers lay within the paper used to make the material.

SURFACE AND THICKNESS

Richlite is a pressed product and is not cast nor extruded. Due to this process, there are slight variations in the thickness of the panels. Please see enclosed tolerance sheet on page 26 for dimensional specifications.

The surface texture is a result of the pressing process and has a “mill finish” that is similar to a matte laminate or melamine. The mill finish is not protected in shipping with a film and may endure light scratches in the handling process. As a testament to Richlite’s durability, there have been improperly handled panels in shipping that were turned into beautiful finished product.

The mill finish should be sanded as specified by the fabrication instructions within this manual to remove light scratches from handling and to ensure a consistent installed product.

SEAMS

Seams will look similar to those of wood or veneers. Seams should be displayed where they make design sense. Consider the impact of the striations when determining seam placement.

DURABILITY

Richlite is an incredibly durable product, but it can scratch. Scratches will eventually patina and are typically superficial. Due to its high impact resistance, gouges or cracks are uncommon. Because of the way it is manufactured with stacked sheets of paper, the edge can be prone to chipping if not eased or radiused properly.

Richlite stands up well to anything acidic, but high-alkaline products may pull or alter color after prolonged exposure.

FINISHES

Richlite looks natural, is non-porous and has a matte finish. The surface of the manufacturer provided samples has been sanded with a 150 grit random orbital sander and buffed with a medium (maroon) ScotchBrite® pad. Richlite does not maintain a polished or highly sanded (higher than 150 grit). This finish is recommended by the manufacturer as the best balance for initial look and feel and eventual wear and patina.

FINISH OPTIONS

No Finish

We do recommend putting a finish on the surface, however, if one desires not to apply a finish the integrity of the material will not be compromised. The surface, however, will start to appear “chalky” and will also pick up oils from fingerprints, food, etc.

Mineral Oil

Mineral oil brings out a deep luster, however, requires more maintenance. Because Richlite material is non-porous the oil has a difficult time penetrating the surface. Water marks may appear from glasses and tableware as the oil and water do not mix. If you are using soap and water to clean your countertops be aware the soap will expedite the removal of oil and the countertops will start to appear chalky.

Bioshield Wood Counter Finish

Wood Counter Finish from Bioshield is a great eco-friendly choice. The finish is oil-based with a hardener mixed in so it stays on the surface much longer and will not be removed with soap and water. It also acts as a better repellent to water marks, stains, etc. This is the preferred finish for residential use as it has low VOCs.

Richlite Color Enhancer

Richlite Color Enhancer is the most maintenance free finish, but it will require some maintenance. It is recommended for larger commercial projects and can be applied easily in the field.

Howard Naturals Wood Polish

If your project is using the Bioshield Wood Counter Finish or Richlite Color Enhancer, Howard Naturals Wood Polish is an easy-to-apply rejuvenator/polish that can be used by the end user on a regular basis for touch ups or to enhance the deep luster. The wood polish is not recommended when there is no finish or only mineral oil applied.

COMPARING RICHLITE

Richlite is in the same price range as stone and solid surface.

Richlite Surface is completely different from all other countertop materials. The solid surface industry has educated consumers to expect seamless installation, built-up edges and connected back splash, which are natural properties/attributes of those materials. Richlite does not fit into this concept. Richlite encourages educating clients and consumers on the unique attributes of Richlite surface materials. Please contact your Distributor for any promotional or sales assistance.

Good candidates for Richlite include those considering soapstone, limestone, concrete based products, or wood; those who want a natural look and feel; and those who appreciate the beauty of something that shows the worn patina of use. Consider recommending a different product for those who:

- Want an even, solid color, seamless installation or polished finish
- Expect their counter to stay in perfect like-new condition regardless of how they treat it
- Are not prepared to follow the Care & Maintenance instructions or provide the needed upkeep for the desired finish.

COMPARISON OF RICHLITE TO STONE AND QUARTZ PRODUCTS

- Richlite will stand up to heat (350 degrees F) without cracking.
- Richlite is stronger than stone; it requires no underlayment to support it even on long cantilever spans (example: 24" unsupported at 1-1/4" thick)
- Richlite is warm to the touch.
- Richlite has a soft appearance.
- Richlite has a slight "yield" so glass or crystal will not break when a glass is set down with authority, as would happen with a stone counter.
- Richlite will not damage knives (this practice is not recommended as it will scratch the surface).
- Routed drain boards can be easily cut into Richlite surface.
- The thickness is consistent through the entire slab, not just at the edge. This distinction is very apparent when using an under mounted sink, as the edge thickness shows at the sink cut-out.

COMPARISON OF RICHLITE TO SOLID SURFACE

- Richlite will not melt with heat exposure; it requires no special care or fabrication for areas adjacent to heat elements such as dishwashers and ranges.
- Richlite is strong enough that seams can be placed exactly in the corners, and corners can be 90 degrees.
- Richlite can span and cantilever to a much greater distance than other materials.
- Richlite has a natural honed look, not a plastic appearance as is common in solid surfaces.
- Richlite has an appealing natural variation and tone, not an even pattern typical in solid surfaces.
- The thickness is consistent through the entire slab, not just at the edge. This distinction is very apparent when using an under mounted sink, as the edge thickness shows at the sink cut-out.
- Much stronger & less prone to cracking in the shop & field.

HANDLING & DELIVERY

DELIVERY OPTIONS

Richlite is shipped from Distributor's warehouse or drop-shipped from Richlite Company HQ (Tacoma, WA). Will Call at Distributor's warehouse. Please contact your distributor for additional freight and shipping policies.

- All orders, including drop-shipments, must be placed through Distributors.
- Richlite is crated in Corex and banded on a pallet.
- Consider weight, a forklift will be required at the receiving location.
- Consider accessibility to site or shop.
- Limited Access Deliveries, Lift Gate, Residential Delivery areas and Notification/Appointment Required may occur additional charges and must be noted prior to ship.

INSPECTION

Every effort has been made to provide high quality material, free of defects. However, you, the fabricator, must:

- Conduct a final (pre-cutting) inspection to continue the quality control process prior to fabrication.
- Inspect material immediately upon receipt or at time of will-call.
- If the material is defective or flawed you can either:
 - Place templates to avoid flaws
 - Order replacement material and initiate a request for credit

REPLACEMENT MATERIAL

Do not notify the factory. Notify your Richlite Distributor by sending an e-mail message which includes:

- Photos of the material in question,
- A copy of the invoice for the effected material,
- A written description of the defect,
- Any other pertinent information

Your Distributor will respond with either authorization and instruction for return of the material and/or approval or denial of a credit memo. Credit memos will typically include the original cost, plus freight for the replacement material, and freight for the returned material, if applicable. The credit memo will be issued upon confirmation that the material deemed defective was received at the appropriate point of its origin; a copy of the freight bill for return of such material, if applicable, was received.

NOTE: Richlite does not supply credits for fabrication or material handling costs.

STORAGE & HANDLING

- Carry vertically if possible. Richlite weighs 6.5 lbs per square foot at 1" thick. A 1"x60"x144" sheet weighs 395 lbs. See Richlite Sheet Sizes and Weights on page 26.
- Store between 40-80 degrees Fahrenheit.
- Do not over stack.
- Store flat, do not tip on edge
- Stone forklift edge clamp can be used.
- Anver vacuum lift VPF-57-DC can be useful for material handling.

TOOLING

EQUIPMENT

Saw Blades

- Leitz 10" melamine 80T, negative hook, serial number WK 860-2 / 15001215
- Amana 12"x72T, negative 6 degree hook, #512-721-30
- FS tool 7.25 x .115 x 5/8 x 40T, triple chip negative hook, #LH743
- For curves: Jigsaw Blade—DeWalt DW 3750-5 or 6TPI (a cobalt steel blade)

Routers

- 3 ¼ Horsepower minimum
- Variable speed
- A straight bit—solid carbide
- An assortment of various profiles
- OF 2000 Festool #57426

Clamps

Traditional mechanical screw type and vacuum clamps. Screw clamps are required to ensure a good bond with structural epoxies.

Drill

- Pilot holes for pan head sheet metal screws
- #8: 9/64" – 5/32"
- #10: 11/64"-3/16"
- #12: 7/32"-1/4"
- For larger holes use bi-metal hole saw or carbide-tipped hole saw. Can be used but tend to wear out quickly due to heat buildup. Routing is preferable to hole saws for thick material and large holes.
- For small holes use titanium or cobalt bits

Biscuit Cutter

DW 3751-5 minimum power- 6.5 amps

Saws

- Circular saw
- Sliding table saw
- TS 75 Festool #56118

Sanders

- Random Orbit Sander 5": ETS 125 EQ Festool #571610, Makita, dewalt palm sanders
- Belt Sanders are not recommended! Heat retention will burn richlite edge surface.

Stone Tooling

- All stone diamond tooling can be used with Richlite.
- Water is acceptable, though not recommended for fabrication, provided that it is not allowed to sit or soak for extended periods of time.
- Sanders are required as specified

Solid Surface Tooling

- Most solid surface tooling can be used to fabricate Richlite.
- Sanders are required as specified, solid surface mesh sanders are too aggressive for finishing Richlite.

Vacuum

CT 22 Festool #583366

SUPPLIES**Sanding and Buffing**

- 150 Grit Sanding Discs
- Maroon ScotchBrite® Pads (Scuff and Buff Disc, Item # P04-7447, available for purchase at specialtytools.com, 800-669-5519)

Two-Part Epoxies

- Industrial Epoxy formulated for Thermoset Resin or Phenolic Resin
- 5 Minute General Purpose Epoxy: Devcon DEV-20845
- Loctite E-120HP, Hysol
- JB Weld: 3M Scotch - weld epoxy DP-125
- System Three T-88 for anything structural (Available for purchase at systemthree.com)

Sikaflex- One Part Urethane

Edge connectors

- 3/4" Richlite splines
- K20 Lamello Joint Fastener (Hafele part number 267.91.020, or Item # 156100: Amazon.com)
- Mechanical joint fasteners (Knap & Vogt "Tite Joint Fastener", "Dog Bones")

NOTE: Do not use standard #20 biscuits. Lack of water in epoxy does not expand biscuit.

FINISHES

- Richlite Color Enhancer.
- Bioshield Wood Counter Finish
- AFM Naturals, AFM OILS: AFM40116
- Howard Naturals Rejuvenator (www.howardnaturals.com)

PLANNING

LAYOUT

Seam Placement

Seams will show and should be incorporated into design layout. For both structural and aesthetic reasons, seams should be placed at natural positions such as corners or midpoints. Structurally, the seams may be placed exactly at a 90 degree (perpendicular) corner.

Seams may also be placed over a dishwasher if necessary. Make sure your client understands where the seams will be placed and how the grain direction will run.

Grain Direction

Richlite has a mottled appearance, which patterns in a striated effect lengthwise. This feature is most apparent in the lighter tones, but can be seen in darker colors including black. Consider the effect of grain direction when planning cuts; crosswise grain direction is not recommended.

DESIGN

Edges

Any edge treatment or design can be applied to Richlite. All common profiles available to fabricators in both wood and stone tooling can be applied to Richlite countertop edges.

Thickness

The minimum recommended thickness for horizontal use is $\frac{3}{4}$ ". $\frac{1}{2}$ " can be used only with the proper engineering and fastening to insure material stability. Material thickness less than $\frac{3}{4}$ " is typically suitable for vertical use only, such as in back splashes or wainscoting.

Cantilevers and Spans

Richlite is extremely strong, and due to the engineering of the product, can be cantilevered in many applications. Generally, $\frac{3}{4}$ " will remain stable with a 12" overhang, 1" with an 18" overhang, 1 $\frac{1}{2}$ " up to 24". See General Guidelines, page 27, for exact information on strength when designing to maximize span or cantilever. Richlite only provides general guidelines and specific applications and designs are the responsibility of the architect and structural engineer.

FABRICATION BASICS

SELECTING THE “A” SIDE

Evaluate both sides of the sheet to determine which side is more desirable to use. There is no “A” or “B” side to Richlite. Small voids and bumps may occasionally occur on the surface of the panels. Those that cannot be avoided will require careful attention when sanding.

CUTTING

The factory edge is rough-cut.

MACHINING

Richlite properties are consistent through the entire thickness, so it is appropriate as a machined product; machining does not affect the structural integrity of the material. Be aware that the end grain is usually darker and finer in texture than the surface. Lines between layers may be exposed by contoured cuts into the surface. Trace the template on to the Richlite product and execute a rough cut-out of the countertop. It is ideal to have the rough cut as close as possible, leaving only enough material to finish with a router or sander. Since the material is so dense, the more material shaven off with a router, the more chatter it will create, resulting in a rough edge.

- Due to the weight of the material, stationary cutting with a circular saw, panel saw or CNC router is preferred over table saws.
- Sliding table saw between 3,450 RPMs and 4,000 RPMs
- An even rate of speed will prevent burn marks (if burn marks appear, these can be routed off, but are difficult to sand off)
- When cutting seams go over with Felder saw or router with a straight edge (running at 15000-16000 RPMs)

Routing Drainboards

Do not rout any area deeper than what would leave 3/4” minimum thickness. Drain boards usually require at least 1-1/4” thick material.

PREPARATION FOR SEAMS

Appearance

Seams should be level, flat and very tight: a hairline mark that can be seen, but not noticeably felt on the surface.

Structural

Seams should run the entire depth of a counter to be structurally sound.

Indexing

Richlite is pressed and is not cast or extruded, so the thickness may vary from sheet to sheet or within a sheet. The surface on either side of a seam must always be indexed from the top and the difference sanded on the underside. The aggressive sanding sometimes needed will expose several layers of paper, causing white lines to appear, which look like contour lines on a map. FSC® Certified Richlite products do not show these lines as much as previous products, but it may be visible and should be considered when dealing with two surfaces out of alignment and not in the same plane.

Dry-fit

Dry-fit all seams prior to applying any epoxy.

TYPES OF SEAMS

Biscuits

Do not use traditional wood biscuits as they will not expand nor provide a mechanical advantage. Place Lamello K20 biscuits every 6" starting with the first biscuit 3" from the side. It is important to do a dry fit because if it is not tight fit during the dry fit, it will not be a tight fit once epoxy is used. Cut a slot in the center of the material, indexing from the top as Richlite may have slight thickness variation. Biscuits are engineered with a directional "tooth" that will be difficult to remove in the direction opposite the tooth. To remove the biscuit after dry fit, grab the tip or point end of the biscuit and pull in an arc away from the opposite end.

Splines

An excellent choice for strength. Cut so that when installed in the slot, the grain (paper layers) in the spline follows the same direction as the grain in the sheet.

Tight Joint Fastener or "Dog Bones"

Use in non-structural situations only. Ideal for field installations by out-of-house installers or subcontractors.

Epoxy Only

Make sure that the joint gluing surfaces are roughed-up, 60 grit or less, for better glue adhesion. Do not over-tighten clamps to keep enough glue in the seam. Vacuum clamp fixtures are acceptable.

Mechanical Fasteners

Mechanical fasteners are acceptable for situations where there is access to install them.

EDGE DETAIL

Routing is recommended as saw marks can be very difficult to remove with palm sander. Be careful not to burn the edge with prolonged heat and pressure. Route the edge detail or hand-file roundover per client specification. Use a sharp carbide bit and an even rate of speed to prevent burning. Multiple passes may be required for removing large amounts of material. Sand the edge detail with a random orbital sander or hand sanding.

SURFACE FINISHING

Sanding Process

It is not recommended to sand on job site due to the high amount of dust generated when sanding Richlite.

Using a random orbital sander with 150 grit sandpaper, go over the surface area lightly and evenly. There is no need to apply pressure, just enough to keep the sander on the surface.

Remember, Richlite is made with cellulose fibers (layers of paper). If you sand too aggressively in one area for too long, you will create something to the effect of a “topography” map by burning through a layer of paper.

Sanding Technique

1. Sand the length of the sheet first.
2. Turn 90 degrees and sand perpendicular to the initial pass.
3. Follow with ScotchBrite® in 12” circular motion to even linear sanding pattern.
4. Clean with soap and water.
5. Apply finish

Applying Richlite Color Enhancer

When selecting to finish the surface with Richlite Color Enhancer, first sand the surface as detailed above. Although not recommended, if the surface is being finished in the field, it is important to mask adjacent edges and walls to protect them from the finish. Apply the finish liberally across the entire surface, including the edges. Work quickly to avoid streaking. Warm or circulating air will speed the drying time, so these conditions should be avoided. Follow with clean dry rags, wiping in a large circular motion to remove excess finish. Buff to an even, matte finish. When the rag becomes saturated, use a fresh rag to avoid streaking.

If streaks are visible, let the surface dry and ScotchBrite® again to attain an even surface. Clean with soap and water and reapply the finish. Color Enhancer will not “burn” into previous coats. Apply two to three coats, allowing 20 minutes between coats. Sanding is not required between coats.

CNC MACHINING

CNC machining is an excellent way to fabricate curves and cut undermounted sink cutouts. Feed rates with CNC routers and machining centers vary depending on the tool. Please consult your machine tool sales person for more information regarding the specific application of cutting cellulose sheet phenolic resin panels.

Richlite is one of the densest products a CNC will ever cut. It is very important to have a specific router bit for cutting it to protect the machine and the router bit and for the safety of the operator.

FEED AND SPEED

Materials 3/4" and Thicker

Rotation speed 16,000 RPM, working speed 4400mm per minute, and lowering speed 8000mm per minute. Use a 1/2" compression 2 flute bit with cutter length 1/4" longer than material thickness. Recommended bit to use is a Series 3100 2 flute compression spiral 1/2" diameter, 2" cutter length, and part #3162 from Vortex (800-355-7708).

Materials 1/2" and Thinner

Rotation speed 18,000 RPM, working speed 5000mm, and lowering speed 2000mm. Recommended bit to use is a 3/8" diameter straight flute part #4037 from Vortex.

DRILLING

Rotation 4000 RPM, lowering speed for 5mm bit is 1500mm per minute, slower for larger bits.

CUTTING

To rout Richlite you must make sure you cut in steps of 1/4" to 3/8" at a time. Cut the piece 1/64" bigger than it needs to be using the stepping process. Then come back and cut 1/64" off with no step to clean and polish the edge. This will save a lots of sanding time.

- Do not cut more than 1/4" material without the stepping process.
- Do not come straight down at the starting point with router bit; this will prevent the material from burning. If you start at a spot that will not be seen, you can come straight down into the material on the starting point. If starting on an edge that will be seen, use a 45-degree head in and out. If the material is smaller than the machine can hold down safely, use an onion skinning technique. Leave 1/16" short from the table so you can route the piece off with a bearing router.
- When cutting out a small hole (ex: faucet hole) with a router, use a pocketing program to prevent material from flying around the shop. Use the same process for sink cut outs. Because the material is slightly inconsistent in thickness, edge profiles are best put on later with the router.

INSTALLATION

Install Undermounted Sinks

Richlite works well with undermounted sinks. The best option is to use a pan head sheet metal screw to install the clips provided with the sink. Be sure to use the specifications provided in these fabrication guidelines and do a test sample to insure strength from the appropriate pilot hole drilling. Plastic expanding inserts and brass screws that come with sinks for attaching the clips tend to not work well with Richlite. Another suitable option are the solid surface threaded mounting bases. It is very important to use the correct glue for this application. See page 14 for material suggestions.

Complete Seams

1. For shop finished tops, use blue tape on both sides of the seam to protect the finish and for ease of cleanup. Apply the epoxy to the biscuits, using a minimal amount on the upper part of the seam to reduce the overflow of epoxy.
2. Clean excess epoxy with lacquer cleaner, thinner, or acetone.
3. Use long bar clamps or vacuum clamps to pull the seam together
4. If you have a captured installation, raise the seam section to insert the biscuits, then gently press the counter down and drive wedges at each wall below the splash line to drive the seam tight.
5. Check the reveal consistency at the front edge.
6. Silicone or screws can be used for fastening. Drill a pilot hole that is slightly smaller than the screw thread. Because of its density, Richlite is nearly impossible to screw into without a pilot hole. The pilot hole should be slightly longer than the screw. You may not be able to penetrate the hole further after your screw reaches the end of the pilot hole, and there is a possibility of damaging the product.
7. Drill holes for fittings.
8. Apply Finish
9. A copy of Care and Maintenance Information must be provided to the end user to ensure proper product care.

TROUBLE SHOOTING

OVERSANDING

Oversanding will create an undesirable pattern, like contour rings on a map. It is most noticeable in darker colors. Be cautious with seams and uneven surface areas (bumps or divots). After applying finish, these may even out, but the lines will never disappear.

SANDING TOO AGGRESSIVELY

Will develop an extremely mottled pattern; especially noticeable on Black Diamond. Use only a random orbital sander on the finish surface with no added pressure.

ADDRESSING UNEVEN THICKNESS

Tolerance is 40/1000 per inch, (+/- 4%) Index from the top and belt sand difference along the bottom front edge. Dry-fit all seams. See tolerance on page 26.

FIELD VERSUS SHOP WORK

Richlite can be a dusty fabrication process and fabricating or finishing in the field is not recommended. Both the dust created and the Richlite Color Enhancer in a home can create air quality issues that can pose a problem for end-users. Sealing will require the use of blue tape on seams to ensure that overflow of adhesive does not compromise the surface finish.

REPAIR

- Use router dust mixed with epoxy in thick paste form to do small spot repairs. Depth of repair may need to be made deeper for repair to take.
- Use melamine or laminate patch for very small spot repairs.

LONG TERM MAINTENANCE OPTIONS

- Apply Howard Naturals Wood Cleaner & Polish.
- Clean with mild soap & water then reapply finish.
- ScotchBrite® surface, clean with mild soap and water and reapply the selected finish.
- Sand, ScotchBrite® surface, clean with mild soap and water then reapply selected finish.
- Ensure end user has received a copy of the Care and Maintenance instructions to ensure proper product care for the life of the product.

CARE + MAINTENANCE

ROUTINE CLEANING AND UPKEEP

Richlite surface is a durable, attractive material designed to stay beautiful for the lifetime of your kitchen, bath or office space. A simple wipe up with a damp sponge on a regular basis will maintain its beauty. Murphy's Oil soap can also be applied at full strength for regular maintenance. Alkaline soap such as regular dish soap will gradually dull the surface, this usually occurs around the sink area. Howards Naturals Wood Cleaner and Polish will slightly renew the luster if used on a regular basis. Richlite recommends that fabricators finish the surface with Richlite Color Enhancer to provide a rich, polished finish that requires minimum care.

REMOVING STAINS

Generally speaking, Richlite resists stains quite well. As with most materials, there is a potential for some staining. With stubborn stains, try a nonabrasive household cleaner. Avoid using bleach products or abrasive cleaners. Plain yogurt can be used to pull stains from lighter colored material.

REPAIRING SCRATCHES AND BURN MARKS

Richlite is extremely dense and durable. The material resists scratches and burns, but like most surfaces, can potentially be damaged by cutting directly on the surface or setting a hot frying pan on the surface. Richlite recommends the use of cutting boards, hot pads and trivets to protect the surface from potential damage. General wear in small areas can be spot treated with Richlite Color Enhancer or BioShield Wood Counter Finish. Apply the finish in small amounts with a clean rag, and rub it into the worn area. Follow immediately with a dry clean rag to buff the finish into the adjacent surfaces.

For larger scratches, tough stains or gouges, please contact your Richlite fabricator or dealer for repair advice. In most cases, it is preferable if the installer refinishes the surface. Light scratches and burn marks can be refinished using a Maroon ScotchBrite® pad. It is important to note, the refinished area will noticeably lighten compared to the surrounding surface area. Richlite surfaces are made of paper which, like wood, patinas – or darkens – over time, especially in the lighter colors such as Baguette or r100. The recently sanded area will eventually patina and match the remainder of the counter surrounding it. In order to avoid affecting one spot, lightly refinish the entire section of the counter.

GENERAL PRECAUTIONS

Richlite countertops are stain resistant to nearly all kitchen related substances with the exception of some raw meat juice (such as liver), high-alkaline fruit or vegetables (such as papaya and red beet), and high-alkaline soaps (such as automatic dishwasher powder and oven cleaners) when left in contact for a prolonged time. The lighter colors in the Richlite color range will show stains more than darker colors. Additionally, grout (which is a high alkaline product) will lighten darker-colored Richlite counters and darken the lighter tones. Cover the surface with a protective sheet when installing tile around countertop areas. Avoid using bleach products or abrasive powdered cleaners. It is good to avoid using the abrasive side of sponges, as this may also scratch the surface of a Richlite countertop.

PROFESSIONAL REFURBISHING

As desired, the customer should contact a dealer or fabricator for any of the following options, defined below.

Standard Reseal

Clean with soap and water. Reapply two coats of selected finish

Buff and Reseal

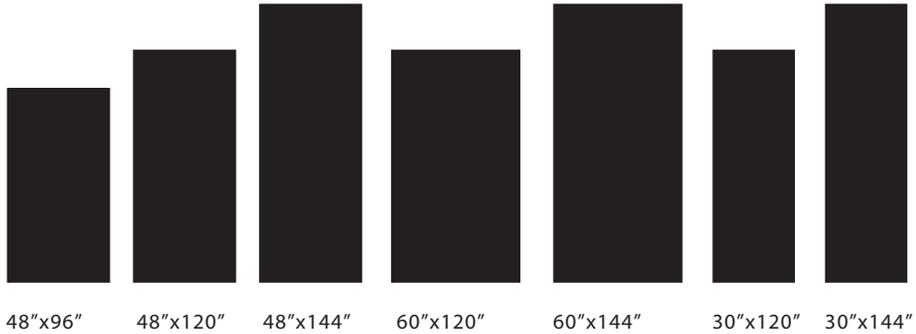
Clean with soap and water; ScotchBrite® pad on random orbital sander, clean with soap and water, reapply selected finish.

Full Refinish

Sand, ScotchBrite® and re-apply selected finish.

* ScotchBrite® is a registered trademark of 3M Company.
Howards Naturals can be purchased at many paint stores nationally. It is also available at:
www.howardnaturals.com/wood_cleaner_and_polish.asp

RICHLITE SIZES, WEIGHTS & THICKNESS



RICHLITE PANEL WEIGHTS

thickness	48x96	48x120	48x144	60x120	60x144	30x120	30x144
in.	Weight						
1/4	53	66	79	83	99	Thickness Not Available in These Sizes	
1/2	105	131	157	164	197	Thickness Not Available in These Sizes	
3/4	155	194	232	242	291	121	145
1	206	257	309	322	386	161	193
1 1/4	259	324	389	405	486	202	243
1 1/2	312	390	468	487	585	244	292
1 3/4	359	449	539	561	673	Thickness Not Available in These Sizes	
2	418	522	627	653	783	Thickness Not Available in These Sizes	
2 1/2	520	649	779	812	974	Thickness Not Available in These Sizes	
3	623	778	934	973	1168	Thickness Not Available in These Sizes	

RICHLITE THICKNESS TOLERANCE RANGE

-4%	Fraction	Decimal	+4%
0.24"	1/4"	0.25"	0.26"
0.48"	1/2"	0.50"	0.52"
0.72"	3/4"	0.75"	0.78"
0.96"	1"	1.00"	1.04"
1.20"	1 1/4"	1.25"	1.30"
1.44"	1 1/2"	1.50"	1.56"
1.68"	1 3/4"	1.75"	1.82"
1.92"	2"	2.00"	2.08"
2.40"	2 1/2"	2.50"	2.60"
2.88"	3"	3.00"	3.12"

GENERAL GUIDELINES FOR RICHLITE CANTILEVER AND SPANS

CANTILEVER SPAN

length	thickness	force	breadth of countertop							
			12"	18"	25"	30"	36"	42"	48"	60"
			max deflection							
12"	.75"	100 lbs	.070"	.047"	.033"	.028"	.023"	.020"	.017"	.014"
18"	.75"	150 lbs	.356"	.244"	.171"	.142"	.118"	.101"	.089"	.071"
18"	1.0"	150 lbs	.150"	.100"	.072"	.060"	.050"	.043"	.037"	.030"
18"	1.25"	150 lbs	.076"	.050"	.037"	.030"	.025"	.022"	.019"	.015"
18"	1.5"	150 lbs	.044"	.029"	.021"	.018"	.015"	.013"	.011"	.009"
24"	1.0"	150 lbs	.356"	.244"	.171"	.142"	.118"	.101"	.089"	.071"
24"	1.25"	150 lbs	.181"	.120"	.087"	.072"	.060"	.051"	.045"	.036"
24"	1.5"	150 lbs	.105"	.070"	.050"	.042"	.035"	.030"	.026"	.021"

SIMPLE SPAN

length	thickness	force	breadth of countertop							
			12"	18"	25"	30"	36"	42"	48"	60"
			max deflection							
24"	.75"	100 lbs	.035"	.023"	.017"	.014"	.012"	.010"	.008"	.007"
36"	1.0"	150 lbs	.075"	.050"	.036"	.030"	.025"	.021"	.018"	.015"
36"	1.25"	150 lbs	.038"	.025"	.018"	.015"	.012"	.010"	.009"	.007"
48"	1.5"	200 lbs	.070"	.046"	.033"	.028"	.023"	.020"	.007"	.014"
48"	1.75"	200 lbs	.044"	.029"	.021"	.017"	.014"	.012"	.011"	.008"

IMPORTANT NOTE: Calculating spans and cantilevers incorporates numerous variables, including thickness of material, the length of the overhang, the breadth (or width of the countertop), and the amount of weight it needs to support. It is important that the specifier approximately calculate the specifications based off Richlite properties defined in the properties section due to these variables and to abide by the varying code regulations enforced in different areas of the country.

RICHLITE PROPERTIES

Density

75.84 pounds per cubic foot or .0439 per cubic inch

Water Absorption

24 hour fully submerged test, .36% (1" material without Richlite Color Enhancer)

Specific Gravity

1.213, which means that Richlite is 21% heavier than water by volume

Thermal Properties

Coeff. of Thermal Expansion in X Dir (min/in. ∞ F)	5.2
Coeff. of Thermal Expansion in Y Dir (min/in. ∞ F)	12.8
Coeff. of Thermal Expansion in Z Dir (min/in. ∞ F)	45.9/73.5"
Thermal Conductivity (Cal cm/cm ² sec ∞ C)	0.00051

Tensile Strength

X Direction (psi)	19,200
Y Direction (psi)	13,100

Compressive Strength

X Direction (psi)	18,400
Strain @ Failure	7.09%
Y Direction (psi)	15,900
Strain @ Failure	7.15%
Z Direction (psi)	30,000
Strain at Failure	20%

Flexural Strength (Face in Tension)

X Direction (psi)	22,000
Y Direction (psi)	17,300

Flexural Strength (Edge in Tension)

X Direction (psi)	20,400
Y Direction (psi)	16,100

Izod Impact (Face Impact)

X Direction (ft. lb. Per Inch of Width)	2.48
Y Direction (ft. lb. Per Inch of width)	1.46

Izod Impact (Edge Impact)

X Direction (ft. lb. per inch of width)	0.68
Y Direction (ft. lb. per inch of width)	0.62

MATERIAL SAFETY DATA SHEET

Section 1: Ingredients

Chemical Family: Cured Phenol Resin

Product Use: Various

Hazard Statement: This material safety data sheet (MSDS) has been prepared in compliance with the Federal OSHA Hazard Communication Standard 29 CFR 1910.1200. This product is not considered to be a hazardous chemical under that standard.

Section 2: Physical Data

Appearance: Odorless flat sheets

Percent Volatile: 0 (zero)

Insoluble in water

Specific Gravity: 1.213

Section 3: Fire and Explosion Data

Extinguishing media: Self extinguishing; remove source of heat.

Special fire fighting procedures: Use self-contained breathing apparatus.

Unusual fire and explosion data: Combustion products may be toxic.

Section 4: Reactivity Data

Stability: Stable

Conditions to Avoid: Heat over 350-degrees F

Incompatibility: Very strong alkali

Hazardous Decomposition Products: Combustion may form toxic materials. Oxides of carbon and nitrogen, benzene, toluene, methane, phenol, formaldehyde.

Hazardous Polymerization: Will not occur.

Section 5: Health Hazard Data

Primary Routes of Exposure: Eye, dermal, ingestion or inhalation of dust from abraded material.

Threshold Limit Value: Not hazardous

Overexposure effects: None

Eye Contact: Dust that contacts the eye may be irritating or cause mechanical injury.

Skin Contact: May cause slight skin irritation.

Ingestion: It is reasonable to anticipate ingestion of the dust would be irritating to the GI tract.

Inhalation: Dust may be irritating to the respiratory tract and cause coughing or sneezing.

Section 6: First Aid Measures

Eyes: Immediately flush eyes with water for at least 15 minutes. See a physician if irritation persists.

Skin: Wash with soap and water. See a physician if irritation persists.

Ingestion: No harmful effects anticipated. See a physician if irritation persists.

Inhalation: No harmful effects anticipated. If a problem develops, remove the person to fresh air and supply of oxygen if necessary.

Section 7: Special Protection Information

Ventilation: General mechanical and local exhaust in accordance with ACGIH recommendations.

Protective Gloves: Wear gloves as standard handling procedure.

Eye Protection: Dust-tight goggles are recommended during material abrading operations.

Respiratory Protection: Use NIOSH approved dusk mask if required.

Section 8: Special Precautions

Handling precautions: Nuisance dust may be generated during some material machining processes.

Section 9: Regulatory Information

DOT Proper shipping name: Plastic Laminate Sheets

DOT Hazard Class: N/A

RCRA Status: Not a hazardous waste under RCRA (40 CFR 261)

SARA/TITLE III: Toxic chemicals list: This product does not contain a toxic chemical for routine annual toxic chemical release reporting under

Sec. 313 (4) CFR 372)

Richlite® Surface material

Lifetime Limited Warranty for Interior Residential Use

Richlite Company warrants to the owner of the original installation that its Richlite® Surface material will be free from material defects for a lifetime. This warranty applies only to the original owner and is not transferable.

The obligation of Richlite Company and its distributors is limited, at their option, to repair or replace material found to be defective and excludes shipping charges and costs of removal and reinstallation. This is a product only warranty, not a fabrication and/or installation warranty.

Richlite Company makes no express or implied warranty, including the fitness for a particular purpose even if that purpose is known to Richlite Company. It excludes implied warranty of merchantability. Richlite Company shall assume no risk or liability for results obtained by the use of products covered by this warranty, whether used singly or in combination with other materials. This warranty does not cover any damage to Richlite® surfaces caused by improperly installed, used or maintained appliances which are either built into Richlite® or placed or stored on Richlite® surfaces.

Laws and building safety codes governing the design, engineering and construction of installations vary widely. Richlite Company assumes no responsibility or obligations with respect to the selection of product for the installation or the design, engineering and construction of the installation. Architects, engineers, and designers alike need to review technical specifications of Richlite® surfaces to determine if Richlite® surfaces suit the intended purpose.

This warranty does not cover any conditions or damages resulting from accidents, alterations, misuse, abuse, acts of God, excessive humidity, excessive heat and temperature, fading, patina, or discoloration over time. Richlite® surfaces are a paper-composite material and will patina over time. "Patina" is a natural occurrence in the product and Richlite Company makes no express or implied warranty covering the extent of the patina in the Richlite® surface. This warranty also does not cover any condition or damage resulting from removal of the product or reinstallation in the same or different application.

This warranty does not apply to conditions caused by normal wear and tear upon the product.

To obtain warranty service, contact the dealer from whom you purchased the product. Your dealer will work with their regional distributor and Richlite Company to promptly repair or replace any defective pieces. Warranty claims must be accompanied by proof of purchase, as well as details regarding the nature of the problem, location of the product, etc.

This warranty is exclusive and in lieu of all other obligations, liabilities or warranties. **In no event shall Richlite Company or its distributors be liable or responsible for incidental or consequential damages or for any other direct or indirect damage, loss, cost, expense or fee.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so this exclusion or limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

Richlite® Surface material

20 Year Limited Warranty for Interior Commercial Use

Richlite Company warrants to the owner of the original installation that its Richlite® Surface material will be free from material defects for 20 years. This warranty applies only to the original owner and is not transferable.

The obligation of Richlite Company and its distributors is limited, at their option, to repair or replace material found to be defective and excludes shipping charges and costs of removal and reinstallation. This is a product only warranty, not a fabrication and/or installation warranty.

Richlite Company makes no express or implied warranty, including the fitness for a particular purpose even if that purpose is known to Richlite Company. It excludes implied warranty of merchantability. Richlite Company shall assume no risk or liability for results obtained by the use of products covered by this warranty, whether used singly or in combination with other materials. This warranty does not cover any damage to Richlite® surfaces caused by improperly installed, used or maintained appliances which are either built into Richlite® or placed or stored on Richlite® surfaces.

Laws and building safety codes governing the design, engineering and construction of installations vary widely. Richlite Company assumes no responsibility or obligations with respect to the selection of product for the installation or the design, engineering and construction of the installation. Architects, engineers, and designers alike need to review technical specifications of Richlite® surfaces to determine if Richlite® surfaces suit the intended purpose.

This warranty does not cover any conditions or damages resulting from accidents, alterations, misuse, abuse, acts of God, excessive humidity, excessive heat and temperature, fading, patina, or discoloration over time. Richlite® surfaces are a paper-composite material and will patina over time. "Patina" is a natural occurrence in the product and Richlite Company makes no express or implied warranty covering the extent of the patina in the Richlite® surface. This warranty also does not cover any condition or damage resulting from removal of the product or reinstallation in the same or different application.

This warranty does not apply to conditions caused by normal wear and tear upon the product.

To obtain warranty service, contact the dealer from whom you purchased the product. Your dealer will work with their regional distributor and Richlite Company to promptly repair or replace any defective pieces. Warranty claims must be accompanied by proof of purchase, as well as details regarding the nature of the problem, location of the product, etc.

This warranty is exclusive and in lieu of all other obligations, liabilities or warranties. **In no event shall Richlite Company or its distributors be liable or responsible for incidental or consequential damages or for any other direct or indirect damage, loss, cost, expense or fee.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so this exclusion or limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

Richlite® Surface material

10 Year Limited Warranty for Exterior Residential and Commercial Use

Richlite Company warrants to the owner of the original installation that its Richlite® Surface material will be free from material defects for 10 years. This warranty applies only to the original owner and is not transferable.

The obligation of Richlite Company and its distributors is limited, at their option, to repair or replace material found to be defective and excludes shipping charges and costs of removal and reinstallation. This is a product only warranty, not a fabrication and/or installation warranty.

Richlite Company makes no express or implied warranty, including the fitness for a particular purpose even if that purpose is known to Richlite Company. It excludes implied warranty of merchantability. Richlite Company shall assume no risk or liability for results obtained by the use of products covered by this warranty, whether used singly or in combination with other materials. This warranty does not cover any damage to Richlite® surfaces caused by improperly installed, used or maintained appliances which are either built into Richlite® or placed or stored on Richlite® surfaces.

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This warranty does not apply to conditions caused by normal wear and tear upon the product.

To obtain warranty service, contact the dealer from whom you purchased the product. Your dealer will work with their regional distributor and Richlite Company to promptly repair or replace any defective pieces. Warranty claims must be accompanied by proof of purchase, as well as details regarding the nature of the problem, location of the product, etc.

This warranty is exclusive and in lieu of all other obligations, liabilities or warranties. **In no event shall Richlite Company or its distributors be liable or responsible for incidental or consequential damages or for any other direct or indirect damage, loss, cost, expense or fee.** Some states do not allow the exclusion or limitation of incidental or consequential damages, so this exclusion or limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights that vary from state to state.

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