

Kitchen and bath design is frequently driven by the look and cost of materials.

While that formula may have worked fine in the past, today's homes are built for better energy efficiency, which means they are more airtight. This increases the importance of picking materials and products that don't foul the air and harm the health of a home's occupants. It's equally imperative to understand that our natural resources are dwindling, and that we can manage the environmental impact of a kitchen or bath project through considered choices of building materials.

Think long term and do your research

Designing a healthy, eco-friendly, high-performing kitchen or bath is a balancing act. Even in the greenest project, it's likely that you will have to use products that are not themselves green. They may, however, be used in a manner that helps reduce the environmental impact of the building as a whole. A well-thought-out kitchen or bath design that substitutes intelligent, eco-friendly, benign products for conventional ones can make the difference between a good building and a great one.

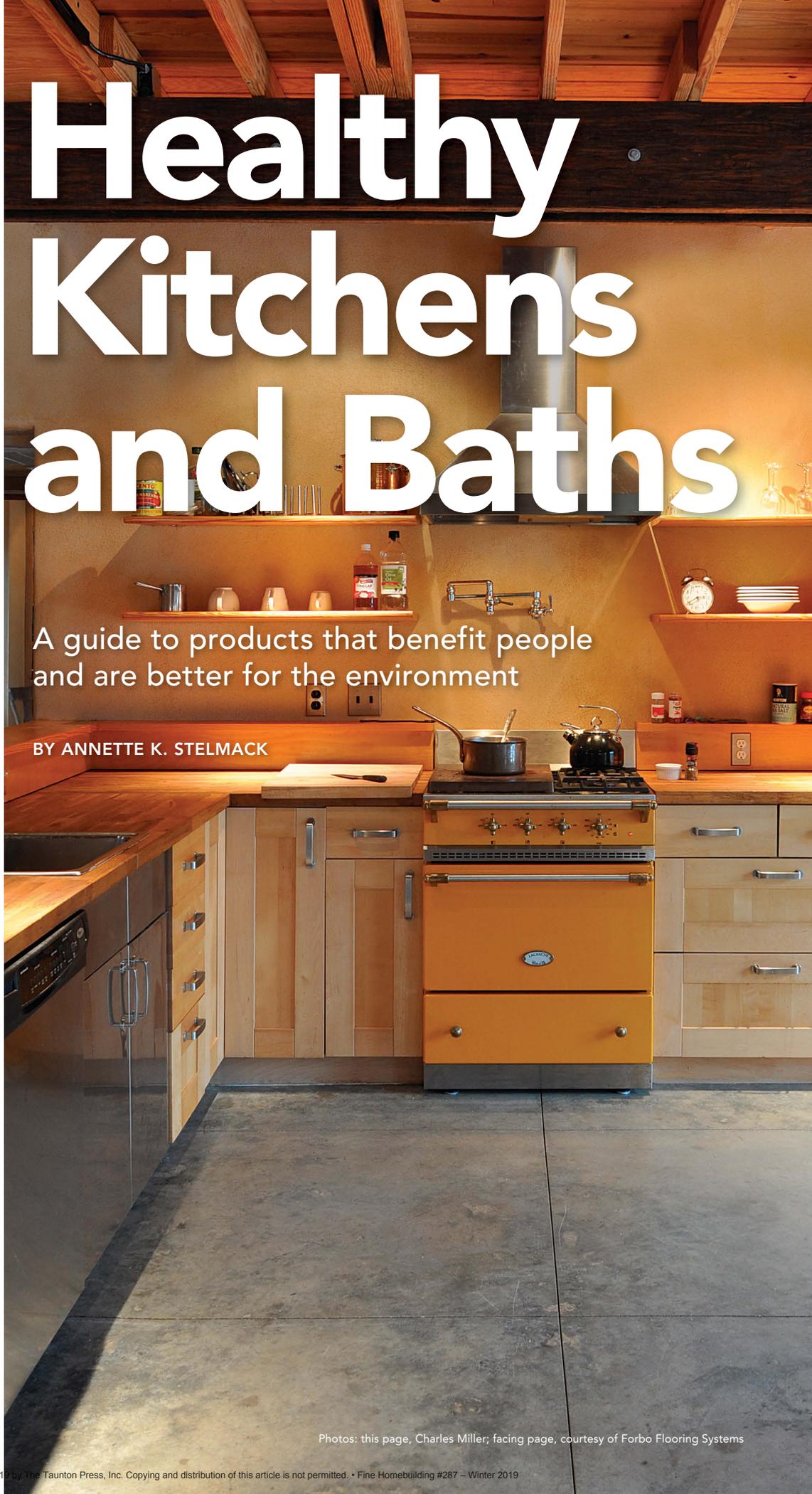
Before picking any products, start with a timeless design—this means anticipating and building for future needs to avoid extensive renovations down the road. This goes hand-in-hand with the durability of the products you choose. Durable, long-life products require less frequent replacement, putting less stress on resources and landfills.

Pay particular attention to how products impact indoor-air quality. Indoor air can be a greater health hazard than the air outdoors; this is of particular concern because we spend

Healthy Kitchens and Baths

A guide to products that benefit people and are better for the environment

BY ANNETTE K. STELMACK



FLOORING

CONCRETE

Concrete flooring (photo left) is nearly indestructible—it will not rot, mold, rust, off-gas, or wear out. Because most homes already have a concrete slab floor, using the concrete as the visible finish eliminates the expense of additional flooring, making it a frugal option. It can also be used for durable countertops in both kitchens and bathrooms.

On the flip side, concrete is energy and resource intensive, and a major contributor to greenhouse-gas emissions. Extracting the raw materials can also lead to environmental destruction and pollution.

Look for concrete made from all-natural materials or verified-safe recycled materials, and use potable water for the curing process. For healthier finishing options, consider natural mineral pigments, and/or bio-based, low-VOC, water-based or water-reducible, low-solvent, formaldehyde-free stains, sealants, and finishes. Additionally, the inclusion of fly ash in the concrete mix can reduce the amount of cement needed, reducing the product's carbon footprint.

EcoProCote (ecoprocote.com) and AFM Safecoat (afmsafecoat.com) provide healthier alternatives to toxic acid stains and concrete-floor finishes.

CORK

Cork flooring is a renewable product that comes from the bark of the cork oak tree, a species that grows primarily in the Mediterranean region, where there are approximately 6.6 million acres of cork forests—making it an abundant natural resource.

Once a cork tree matures, the bark must be harvested every nine to 10 years to support the health of the tree, enabling it to thrive for an average of 200 years. There is virtually no waste created from the processing of cork, and the

environmental impact of shipping cork from Europe is slightly less than that of shipping heavier ceramic tile or stone.

Cork is water resistant, has antimicrobial properties that resist mold and rot, deters pests (even termites), and is a fire retardant. Not all cork products are created equal, though: Avoid cork blended with synthetic fillers or backings.

AmCork (amcork.com) is Greenguard Gold certified, demonstrating low chemical emissions.

WOOD

Wood flooring is a striking, natural selection for many kitchens, as it's easy to clean and doesn't collect mold, dust, or pet hair. When maintained properly, wood can last the lifetime of a home.

Wood has lower embodied energy than nonrenewable mined material like stone or tile, and is categorized as a "slow-growth" renewable resource. Choose products certified by the Forest Stewardship Council (FSC), which promotes responsible forest management.

Whenever possible, consider wood that has fallen on or been thinned from your property, is locally or domestically harvested, or is a nonthreatened species. Another possibility is reclaimed wood.

Vermont Plank Flooring (vermontplankflooring.com) is committed to third-party certification through FSC with a documented chain of custody.

LINOLEUM

Linoleum is made from a mix of linseed oil, pine resin (or tall oil, a byproduct of pine-pulp processing), sawdust or wood flour, cork, and limestone. Linoleum resists bacterial growth, is long-lasting, is comfortable underfoot, and has self-healing properties and all-through color that disguise minor damage.

Confirm that your linoleum is made from linseed oil and other



natural materials that meet third-party certification protocols like FloorScore, which certifies hard-surface flooring materials for indoor-air quality.

Forbo Marmoleum (forbo.com) is committed to sustainability, as evidenced by their full product transparency and documentation through Health and Environmental Product Declarations.

TERRAZZO

Modern terrazzo is offered in a variety of ways, from poured on-site to prefabricated slabs and tiles. It is made from manufactured aggregate or chipped, ground, or sorted minerals bound together in a cement-based medium, a modified cement-blend acrylic additive, or a resinous matrix. Inlays of brass, metal, or manufactured forms are available for unique details. The design and color possibilities are never-ending, and VOC emissions can be below the most rigid standards.

Terrazzo offers various benefits for a healthy, eco-friendly home, and is highly durable and low maintenance. Look for terrazzo that meets third-party certifications from FloorScore, Cradle to Cradle, or Greenguard, and for high recycled-glass content and/or high waste-mineral content—preferably not rare or imported.

The National Terrazzo and Mosaic Association (ntma.com) is committed to using recycled content and materials that support indoor-air quality.

COUNTERS

an average of 90% of our time indoors. Materials used in kitchens and bathrooms can have negative health effects if they promote mold growth when wet, or emit toxic chemicals.

Try to stay away from products containing volatile organic compounds (VOCs), formaldehyde, petroleum-based solvents, heavy metals, fungicides, PVC/vinyl, melamine, latex, or polymer additives—and check product-safety data sheets for additional hazards.

There are a number of ways to assess the health and environmental impacts of building materials and products. First, look for third-party certifications that scrutinize the environmental and health claims of a product. A certification confirms and validates whether industry standards for various criteria have been met and documented. Various certification programs list complying products on their websites (see “Understanding certifications and standards,” p. 32).

Also look for product declarations from manufacturers. Manufacturers can choose to provide a summary of the environmental and/or health impacts of the things they make using industry-standard reporting that allows us to compare products. Specifically, look for Health Product Declarations, which are an industry-accepted transparent disclosure of building-product ingredients and associated hazards, and Environmental Product Declarations, which disclose products’ environmental impacts throughout their life cycle.

Avoid products that have no reputable information on health and environmental effects. When manufacturers aren’t transparent with this information, or their products aren’t certified by outside organizations, these are red flags. Beyond that,

Earth-sensitive and healthier products have emerged due to consumer demand, encouraging the development of countertop options that are both durable and good looking. In today’s market you can find countertops made from eco-friendly materials, including pressed recycled paper, recycled glass-concrete terrazzo, traditional wood butcher block, and linoleum.

As you determine the best counter for your needs, take into account the installation methods and materials required for it. Steer away from countertops that rely heavily on adhesives for installation, and instead select products that are environmentally benign. Some countertops will also require regular oiling or sealing; others require only cleaning with a damp, soapy cloth.

One product I like is PaperStone (paperstoneproducts.net), which is made from 100% post-consumer recycled paper and proprietary “Petro Free” phenolic resins. The same company also makes engineered counters from recycled glass and waste from quarries, and is committed to product transparency and low-emitting materials supporting indoor-air quality.

Another engineered material I like is ECO by Cosentino (photos this page and facing page, ecobycosentino.com), which contains 75% recycled content from mirrors, glass, porcelain, earthenware, and vitrified ash.

STONE

Like concrete, stone counters can be highly durable, depending on the type of stone. The environmental impacts of quarrying stone are similar to extracting the raw components of concrete, and it is not a renewable resource. Generally, though, it’s a healthy material for kitchens and baths.

Look for reclaimed, salvaged, or recycled stone; stone from local or regional sources; third-party certification from the Natural Stone Council; and radon testing of materials before installation. It can be a challenge, but stay away from imported stone.

METAL

Look for salvaged metal countertops; 100% recycled material, or the highest percentage possible; local fabricators to eliminate transportation; and metal that develops a natural, pleasing patina or verdigris without the need for polishing. Stay away from virgin



metal, synthetic oil coatings, and chemical polishes, treatments, or cleansers.

ALKEMI metals (renewedmaterials.com) offers certified recycled materials. Their ALKEMI-copper contains a minimum of 88% to 97% post-industrial scrap materials generated by other industries located within the immediate geographic vicinity of its plants.

WOOD

Follow the guidelines for wood flooring (p. 29). Use reclaimed wood only if it can be verified as safe for a countertop. Make sure food-safe glues are used for butcher blocks or other glued-up counters.

Stay away from reclaimed wood of uncertain origin, chemically tainted wood, uncertified wood, rare or threatened species, and preservatives in the wood or finish.

CERAMIC TILE

Look for third-party certification from Green Squared; tile made with unprocessed, all-natural clays or with safe, recycled materials such as glass; and factory-glazed ceramic. Install with simple mortar from cement, sand, water, and possibly lime, and use additive-free grout.

While some additives in mortar and grout sound like a good idea, many are potentially harmful. Fungicides and biocides meant to stop mildew or other growth, for example, can also harm people and wash into the environment and damage other life. For more details, see “Wet Areas” (p. 33).

GLASS OR GLASS TILE

Look for 100% recycled glass tile or high recycled glass content. Oceanside Glass & Tile (glasstile.com) products are made primarily from silica sand, an abundant natural resource, and recycled content that may include pre- and/or post-consumer recycled bottle glass from curbside recycling programs.



CABINETS

One of the main components for residential cabinets is typically wood. Solid- or veneer-wood drawer fronts and cabinet doors deliver the desirable natural and durable qualities. However, you'll also find particleboard and MDF for more cost-effective cabinet components. Standard cabinet cores and veneer sheet goods usually contain formaldehyde-based binders or solvent finishes which can off-gas. As an alternate to standard sheet goods, consider renewable biocomposite boards that use low-VOC and formaldehyde-free binders and borate preservatives or pest repellants.

More information on overall wood criteria is listed in "Flooring" (p. 29) and "Counters" (facing page). Look for certification from the Kitchen Cabinet Manufacturers Association's Environmental Stewardship Program, which scores products on a number of measures, including effects on air quality.

I have used products from Medallion Cabinetry (photo left); I also like those from Woodland Cabinetry (woodlandcabinetry.com), which meets KCMA ESP certification; the company also takes additional steps to reduce waste and its overall environmental impact.

there are various criteria concerned consumers should consider. Look for products that are sourced as locally as possible and are sustainably produced. Zero- or low-impact materials, which are typically made from natural sources such as wood, agricultural products, or stone, require minimal processing and are generally healthy and eco-smart. Renewables—typically agricultural materials with harvest rotations of less than ten years—are usually good options because they are natural and can replenish themselves quickly. Also look for products with recycled or repurposed material content, and materials that can be infinitely reused or recycled without losing integrity, such as steel or glass.

And don't forget finishes. Various products require some sort of surface finish to perform well and extend their life. Look for those that are water-based or made of natural (sometimes called food-grade) oils, resins, pigments, and waxes. □

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FIXTURES

Unsurprisingly, environmentally conscientious plumbing focuses on the consumption of water. Americans use roughly 92 gal. of water per person daily, and more than three-quarters of that is used for washing machines, showers, toilets, and dishwashers. We could reduce residential water use by up to 60% if every U.S. household installed water-saving fixtures and fittings.

The WaterSense labeling program provides independent third-party testing for water efficiency and performance, making it easy for you to choose products that use less water without sacrificing quality or performance (WaterSense-certified Moen fixtures are shown in the photo, left). Consider buying smaller tubs to support water efficiency, install fewer nozzles in showers and tubs to reduce the water consumption per use, and choose fixtures that can be recycled. Cast iron, steel, glass, and ceramic are recyclable; acrylic and fiberglass are not.

Understanding certifications and standards

Product claims must be linked to certifications in order to validate your product and material selections. Industry standards addressing environmental and health benchmarks examine the environmental and health impacts through a guideline or set of criteria for judging and determining the quality, safety, value, and health of a product.

A product certification confirms and validates whether industry standards and claims have been met and documented. Some certifications are referenced throughout this article, but there are too many to list. Here are some additional reliable resources and databases to help you navigate the ever-growing world of green products and manufacturers.

- ▶ Underwriters Laboratories has a database of more than 100,000 green products available at spot.ul.com.
- ▶ Formerly known as Scientific Certification Systems, SCS provides a directory of SCS-certified green products at scsglobalservices.com/certified-green-products-guide.
- ▶ Cradle to Cradle evaluates products on material health, material reuse, renewable energy and carbon management, water stewardship, and social fairness. Its registry of certified products is available at c2ccertified.org.
- ▶ Declare is a program that labels goods with a full list of ingredients. All Declare labels are viewable at living-future.org/declare.
- ▶ The Forest Stewardship Council maintains a database of certified companies and wood products at fsc.org.
- ▶ A database of Health Product Declarations is available at hpdrepository.hpd-collaborative.org.
- ▶ The Natural Stone Council maintains a list of quarries that meet the Natural Stone Sustainability Standard at naturalstonecouncil.org/sustainability.
- ▶ Manufacturers certified by The Kitchen Cabinet Manufacturers Association's Environmental Stewardship Program can be found at kcma.org.



WET AREAS

TILE

Tile is a common product used throughout kitchens and baths, is extremely durable, and is perfect for wet areas. Tile covers a broad spectrum of materials, from ceramic, porcelain, terra cotta, or earthenware (all of which are types of fired clay) to new or recycled glass, cement, stone, and terrazzo.

Tile manufacturing has a few environmental disadvantages. Tile is made from natural materials—clay, sand, or stone—that are nonrenewable, and may contain synthetics, recycled compounds of questionable origin, or rare minerals. Excavating the raw materials for tile can scar landscapes and degrade water quality, and it takes a lot of energy to fire tiles in kilns. Tile glazes may also contain toxic chemicals. The good news is the final glazed product is inert. It's neither a source of contaminants, nor will it collect them.

Fireclay Tile (photos this page, fireclaytile.com) has B Corporation certification, a third-party standard that verifies that the company holds itself to high standards of performance, accountability, and transparency. All their products—ceramic, glass, and brick tiles—are manufactured in North America, with 66% made from recycled materials using lead-free glazes.

Crossville Tile (crossvilleinc.com) produces porcelain tile products that follow industry standards for responsible sourcing, conservation, and the use of recycled tile content in addition to providing Environmental Product Declarations and Sustainability Reporting. They are the first U.S. tile company to receive third-party certification from Green Squared covering their entire



manufacturing process. Crossville has a one-of-a-kind program that accepts previously installed fired porcelain, cut scraps, and loose samples for recycling into brand-new tile.

GROUT

Simple grout made of Portland cement, sand, and water (lime is optional) works very well in many residential applications, and mineral pigments may be added for color. Unsanded grout should be specified if the tile might be easily scratched (glass) or will have very narrow grout joints. Specify additive-free grout. Be aware that commercial grout blends may contain a host of questionable ingredients and outgassing components, so look for those without synthetic latex or polymer additives, and those that have third-party certification like Green Square or Cradle to Cradle.

For low-VOC grouts, I've used Laticrete products as they offer a wide range of low-VOC, thin, medium, and thick bed mortars. These include Greenguard-certified products for interior or exterior adhesion of ceramic tile, stone, glass, brick, and other materials to a variety of substrates. Mapei products also offer low-VOC mortars for a wide range of applications.