A HEALTHY & HYGIENIC CHOICE

PORCELAIN AND CERAMIC TILE

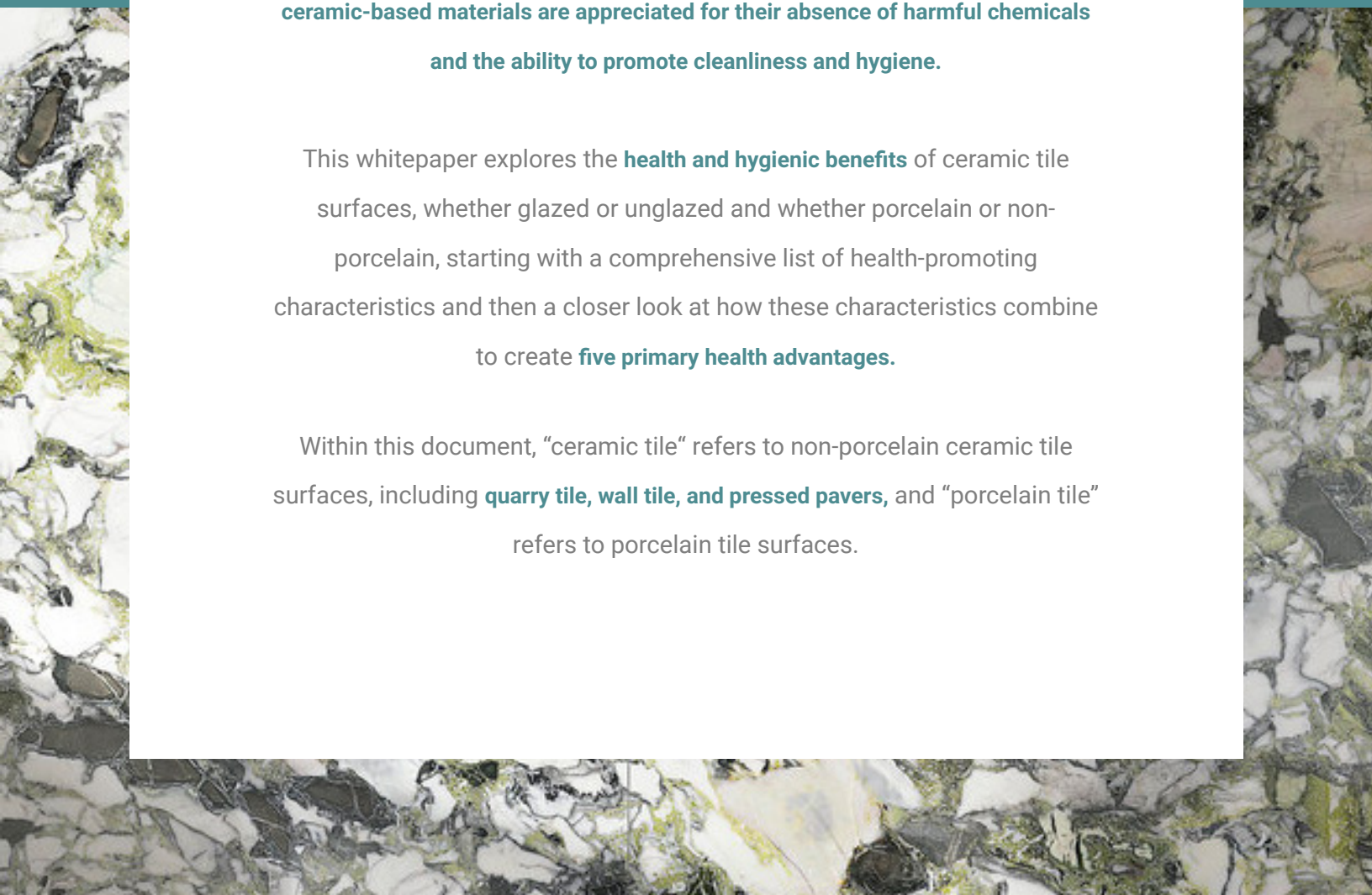


As a society, we're becoming increasingly aware of the importance of health and hygiene. With this greater awareness has come the understanding that **creating a healthy and hygienic environment isn't just about our actions, but also about the materials around us.** Materials in our homes, or areas where we spend significant time on a daily basis, may have an even greater potential to affect our health.

While certain building materials may have environmental or health concerns, **ceramic-based materials are appreciated for their absence of harmful chemicals and the ability to promote cleanliness and hygiene.**

This whitepaper explores the **health and hygienic benefits** of ceramic tile surfaces, whether glazed or unglazed and whether porcelain or non-porcelain, starting with a comprehensive list of health-promoting characteristics and then a closer look at how these characteristics combine to create **five primary health advantages.**

Within this document, "ceramic tile" refers to non-porcelain ceramic tile surfaces, including **quarry tile, wall tile, and pressed pavers,** and "porcelain tile" refers to porcelain tile surfaces.



AT A GLANCE: PORCELAIN AND CERAMIC TILE'S HEALTH & HYGIENE BENEFITS

Porcelain and ceramic tiles are:



EASY TO CLEAN

Water is all that's needed to wipe up most messes — no harsh chemicals necessary.



SCRATCH RESISTANT

Scratches, scrapes, and dents are extremely unlikely with porcelain and ceramic floor tiles, especially as options exist for even the toughest applications.



STAIN RESISTANT

Porcelain and ceramic tiles are highly resistant to stains.



WATER RESISTANT

All porcelain and ceramic tiles are water resistant and do not swell or degrade with moisture; further, porcelain tiles are "impervious," with a water absorption below 0.5%.



BACTERIA RESISTANT

Porcelain and ceramic tiles are inhospitable to the growth of bacteria.



ANTIMICROBIAL

Options are available with antimicrobial properties that can suppress and even destroy harmful microorganisms, such as mold, fungi, bacteria, and viruses.



ALLERGEN FREE

Porcelain and ceramic tile surfaces contain no allergens, and allergens in the environment (such as dust, dirt, and pollen) can't penetrate a porcelain or ceramic tile surface.

AT A GLANCE: PORCELAIN AND CERAMIC TILE'S HEALTH & HYGIENE BENEFITS CONTINUED



NO VOLATILE ORGANIC COMPOUNDS (VOCs)

VOCs are harmful gases that cause various health concerns and that can be found in some flooring types — but not ceramic-based materials, such as porcelain and ceramic tile.



NONTOXIC AND NONFLAMMABLE

Porcelain and ceramic tile surfaces don't emit any toxic fumes when exposed to fire.



NO FORMALDEHYDE

Some wood products may contain formaldehyde. Certain levels of formaldehyde can irritate medical conditions such as asthma and other respiratory disorders.



NO POLYVINYL CHLORIDE (PVC)

PVC is a resin found in many vinyl flooring types. PVC contains phthalates and organotins, both regularly a subject of concern among health experts.



NO PLASTIC

The health and environmental concerns associated with plastic aren't an issue for porcelain or ceramic tile.



ENVIRONMENTALLY FRIENDLY

Porcelain and ceramic tiles are made of naturally-occurring raw materials that are baked into a solid, inert material. You can use porcelain and ceramic tile options inside and outside your home without worry of harming Mother Nature.

1. LOW-MAINTENANCE CLEANING

Making it easier to maintain a hygienic environment.

Porcelain and ceramic tile are water resistant. Further, Bill Griese, Director of Standards Development and Sustainability Initiatives with the Tile Council of North America (TCNA), explains that porcelain is impervious (defined as a water absorption rate of 0.5% or less).[1] Porcelain and ceramic tile's durable, hard-fired surface is also resistant to stains, scratches, dents, chips, and similar damage, with options available for every application. **Scratch resistance is important to cleanliness because dirt can accumulate in scratches and dents as found on nonceramic surfaces.**



A hygienic environment is a clean environment. Ceramic and porcelain tiles make it easier to maintain a clean environment with a refreshingly simple cleaning routine: Simply sweep, wipe with clean water, and dry thoroughly. Water-alone is enough to clean up most messes, reducing the need to use harsh chemical cleaners in your home. Additionally, **slip-resistant** optons do not degrade with cleaning; no coating is needed or recommended as can be the case with other surface materials.



Eliminating the need for harsh chemicals is important, as the Cleveland Clinic warns that many **cleaners can irritate the skin, eyes, nose and throat and cause breathing problems if mishandled.**[2] In a new survey led by the Centers for Disease Control and Prevention (CDC), about one-third of survey respondents admitted to using "non-recommended high-risk practices" while using cleaning products.[3]

2. ANTIBACTERIAL & ANTI-MICROBIAL PROPERTIES

Resistance to the growth of bacteria, fungi, and harmful microorganisms.

Porcelain and ceramic tile may also **extend the effectiveness of regular cleaning** with antibacterial and antimicrobial properties.

Specifically, **porcelain and ceramic tile surfaces naturally resist the growth of bacteria, mold, mildew, and other fungi,** as they need to feed on an organic substance in order to grow. Porcelain and ceramic tile surfaces are inorganic and inert. Soap and organic bodily residues can build up in moist areas, such as a shower, providing "food" for mold and mildew to grow.[4] This is why it is important to clean regularly, make sure to rinse well to avoid leaving any cleanser residue, and dry thoroughly.

Mold and mildew growth may cause headaches, allergic reactions, and other health issues warns Prevention.com,[5] making their presence in our homes a major health concern.

Some porcelain and ceramic tile options offer antimicrobial properties, which can suppress and destroy the growth of harmful microorganisms. Tiny living organisms that are too small for us to see, microorganisms (also known as microbes or, more commonly, "germs") include bacteria, viruses, and fungi that can cause diseases or otherwise affect our health.[6]

These bacteria resistant and antimicrobial properties make porcelain and ceramic tile surfaces an excellent choice for bathrooms and kitchens, which are areas regularly exposed to high moisture and increased surface contamination from human contact and food (all the requirements necessary to grow bacteria, fungi, and other microorganisms).



3. HEALTHY INDOOR AIR

Hypoallergenic, VOC- and formaldehyde-free

Porcelain and ceramic tile offer several **benefits that help promote healthy indoor air** in your home.



For example, **porcelain and ceramic tile surfaces** contain no allergens. A nonporous porcelain or ceramic surface doesn't harbor allergens in the environment such as dust mites, dirt, pollen, pet dander, cockroach allergens, and mold spores. While some nonceramic flooring materials trap these irritants where they may be difficult to remove and/or become airborne and recirculate in your home, they merely settle on a porcelain or ceramic tile surface, where you can wipe them away.

Because **porcelain and ceramic tiles are made of naturally occurring inorganic materials and baked at high temperatures, they are free of the volatile organic compounds (VOCs) and formaldehyde** that many nonceramic building materials contain. Formaldehyde is associated with various respiratory disorders [7] and VOCs can contribute to a wide variety of health concerns, including what's known as "sick building syndrome."[8] The Environmental Protection Agency (EPA) lists additional health effects of VOC exposure as the following:

- Headaches
- Loss of coordination
- Nausea
- Nose, throat, and eye irritation
- Cancer
- Damage to the kidneys, liver, and central nervous system [9]

3. HEALTHY INDOOR AIR CONTINUED

Hypoallergenic, VOC- and formaldehyde-free

Porcelain and ceramic tiles are noncombustible. Because they won't burn, melt, or contribute to a fire, porcelain and ceramic tile surfaces can aid in keeping a clear and safe exit path during a fire. They also won't produce smoke or emit any toxic fumes in the case of a fire, as some other construction materials can.



Considering the EPA's information that Americans spend about 90% of their time indoors and that pollutant concentrations are often two to five times higher indoors than out,[10] promoting **indoor air quality is crucial for our health consideration.** Young children, older adults, or anyone with respiratory or cardiovascular disease are more susceptible to the harmful effects of pollutants and also tend to spend even more time indoors. Every indoor surface should be reviewed for effects on air quality. **Porcelain and ceramic tile's advantages over nonceramic surfaces make for a smart option for families with these health concerns.**

4. PLASTIC FREE

No plastic-related health or environmental concerns.

Porcelain and ceramic tile contain no polyvinyl chloride (PVC) or other plastic materials. The world's third-most widely produced synthetic plastic polymer,[11] PVC is a common ingredient in building and construction materials, including vinyl flooring options — yet PVC is regularly a subject of concern among health experts and builders.

For example, **PVC is known to contain chemical additives** such as phthalates, organotins, cadmium, and lead[12] as well as toxic glues[13] according to New Jersey's Office for Prevention of Developmental Disabilities and the International Association of Certified Home Inspectors (InterNACHI).

PVC can present additional health concerns when exposed to flame. InterNACHI reports that PVC combustion can emit the following:

- **Hydrogen chloride:** A highly toxic, corrosive gas that can cause severe and permanent respiratory damage and burn skin
- **Dioxin:** Thought to be the most dangerous man-made carcinogen, which remains in the environment for long periods of time [14]

Many types of plastic and flooring containing PVC — such as some luxury vinyl tile — **can be difficult to recycle** and will not decompose naturally in a landfill. As PVC sits in landfills, it can continue to be an environmental concern.

Porcelain and ceramic tile present an ideal alternative to plastic-based flooring and are free of these health and environmental concerns.



5. ENVIRONMENTAL SUSTAINABILITY

A healthy choice for the environment.

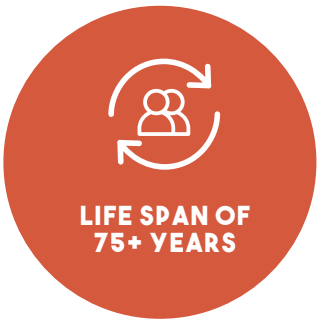
Our efforts to create a healthy indoor space cannot be considered separate from how our decisions affect earth's environment. Porcelain and ceramic tile surfaces promote sustainability with the following eco-friendly advantages:

- **Naturally occurring and indigenous raw materials:** Porcelain and ceramic tile are made of naturally occurring minerals and clays, typically sourced within 500 miles of manufacturing facilities. Not only does this mean products are made from ingredients you can feel comfortable using in construction and living with day after day, it means significantly decreased emissions and energy, which would otherwise result from long-distance shipping.



- **Lowest carbon footprint of any flooring material in North America:** Porcelain and ceramic tile have both the lowest global warming potential and the lowest fossil fuel resource depletion (based on comparison of publicly available flooring environmental product declarations, see Tile the Natural Choice for more information), both key metrics to consider when determining a material's carbon footprint. Global warming potential measures carbon-equivalent gas emissions and is related to climate change, whereas fossil fuel resource depletion measures the nonrenewable energy resources that are used throughout a product's lifecycle.

- **Life cycle benefits:** Porcelain and ceramic tile are incredibly durable, and can be used for generations without replacement. Since the potential service life of porcelain and ceramic tile surfaces is at least as long as the building in which they are installed, environmental impacts from manufacturing, installation, and disposal are considered only once, unlike some other nonceramic flooring options that need to be replaced frequently, each time adding to their environmental impact.



5. ENVIRONMENTAL SUSTAINABILITY CONTINUED

The healthy choice for the environment.

- **Energy-efficient:** The inherent thermal mass of porcelain and ceramic tile reduces peak heating and cooling to help lower energy costs and creates the possibility of natural conditioning for more stable and comfortable indoor environments.



- **Recycling and reclamation:** Porcelain and ceramic tile manufacturers offer wide varieties of products with pre- and post-consumer recycled content. Additionally, high levels of responsibly recovered waste — including dust, powder, unfired scrap, and water — are commonly reincorporated into tile manufacturing. This "closed loop" approach to manufacturing minimizes waste and maximizes resources.

- **Clean disposal and/or beneficial reuse:** Porcelain and ceramic tile are hard-fired solid materials and 100% inert. This means it is non-water soluble, will not leach caustic liquids (as with some other surface materials), and cannot decompose — typically meeting all of the U.S. Environmental Protection Agency's (EPA's) criteria for clean fill. Additionally, when ground up, porcelain and ceramic tile can be beneficial for reuse as an additive to paving and asphalt applications or recycled into new tiles.





- **Salvageability:** Porcelain and ceramic tile are among the few surfaces that can be salvaged in a major renovation and repurposed for other projects.



- **No plastic:** The health and environmental concerns associated with plastic aren't an issue for porcelain or ceramic tile.



RELATED RESOURCES

Explore the following resources to learn more about the health and hygiene benefits of porcelain and ceramic tile. (Note that porcelain tile is a type of ceramic tile and the benefits of ceramic tile extend to porcelain tile, as well.)

- **Easy Cleaning Tips for Porcelain and Ceramic Tile**
- **Low-Maintenance Benefits of Ceramic and Porcelain Tile**
- **Health Benefits of Ceramic Tile**
- **5 Healthy Reasons to Choose Ceramic Tile for Your Next Project**
- **Ceramic Tile's Answer to the Plastic Problem**
- **Guide to Going Green With Ceramic Tile**
- **The Ultimate Guide to Cleaning Ceramic Tile**

SOURCES

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