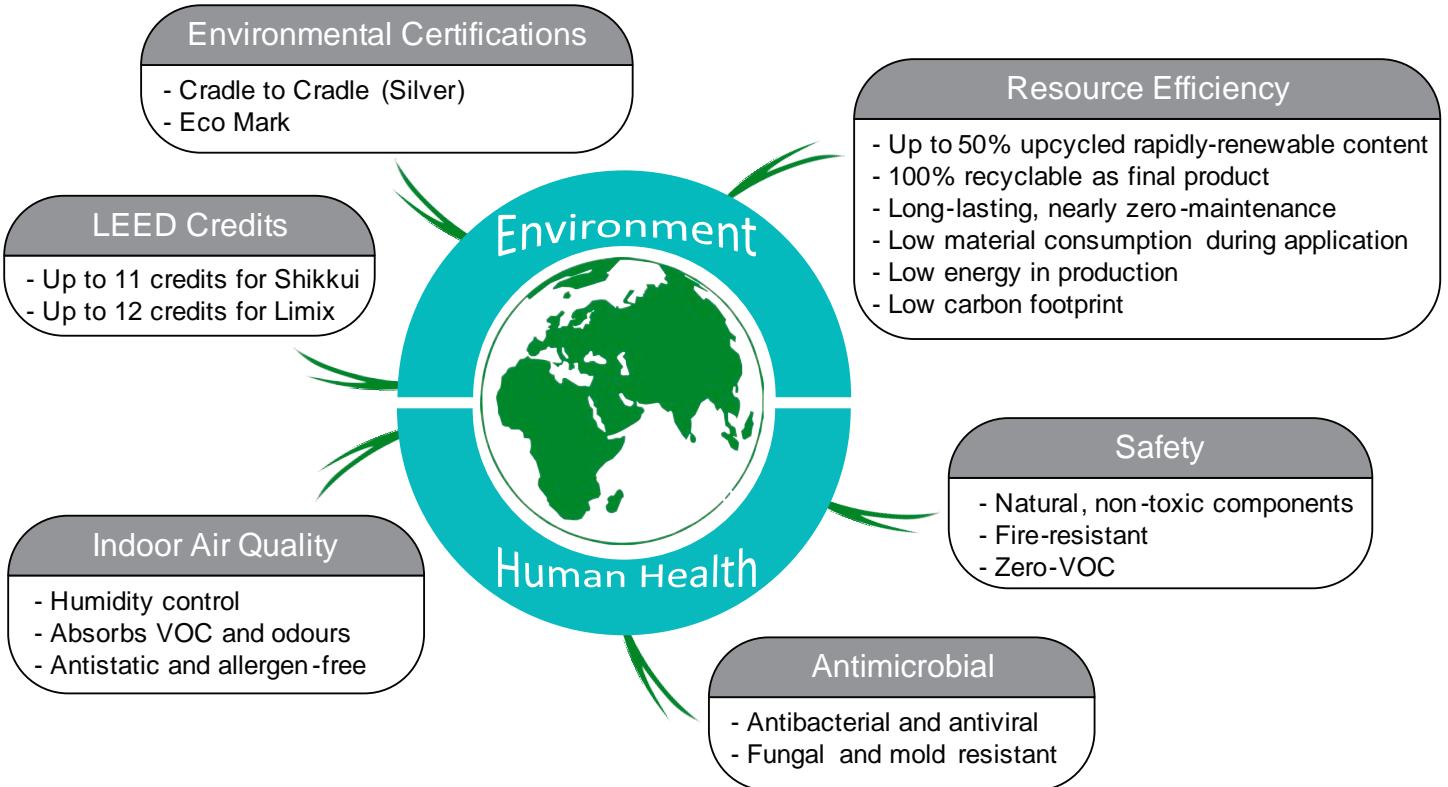


Tagawa Sangyo's philosophy and manufacturing principles are directed toward **Sustainable and Regenerative Design**. Our core values:

(a) new products should be manufactured with a minimum consumption of our planet's limited resources, (b) intensive use of rapidly-renewable and upcycled materials, (c) manufacturing high quality building materials that last, (d) designing natural products that can be easily recycled and re-used, (e) minimizing product's carbon footprint, (f) products that do not harm while promoting human health.

Both Shikkui finishes and Limix tiles are made of the same basic material - calcium carbonate and slaked lime of high calcium purity.



**Resource Efficiency**

Resource consumption and utilization define our relationship with our environment. Tagawa Sangyo's products maximize material utilization, while minimizing environmental impact.



Shikkui coatings and Limix tiles consist of up to 50% eggshells, an **UPCYCLED** and rapidly-renewable content. While the actual meaning of RECYCLING is DOWNCYCLING, i.e. material quality is reduced each time it is recycled, **UPCYCLING implies converting waste materials or useless products into new materials or products of better quality or a higher environmental value.** The use of this rich source of CaCO<sub>3</sub> is an ideal example of preserving limited natural resources while maintaining high product quality. An additional 3-4% of Shikkui coatings are seaweed extracts and plant fiber - also rapidly-renewable content.



All materials are 100% recyclable and can be re-used at the end of their life-cycle. Two most common applications of recycled Shikkui coatings and Limix: as fertilizer (calcium is essential for plant's cell manufacture and growth) and soil enhancer for improving land stability. Due to our products being natural, this poses no environmental threat.



Energy required to manufacture Limix is 89% lower than energy to produce typical baked ceramic tiles. The same figure applies to carbon dioxide emissions. We carefully manage both energy consumption and products' carbon footprint.



Shikkui finishes allow a thin two-coat application, while not compromising surface durability or strength. This reduces material consumption and application costs.



Our surface coatings are designed to last, and become harder as time passes, continuously absorbing CO<sub>2</sub>. A thousand-year history of using Shikkui in Japan and independent testing performed according to international ASTM standards support this claim. Shikkui finishes exhibit hardness of 61-85 according to Shore D scale (ASTM D2240), in addition, their elasticity provides excellent crack resistance. Tests performed on Limix indicate that it is as strong as marble. Long-lasting products are another example of how to benefit environment by reducing the need to renovate.

## Environmental Certifications

Well-known certification systems are a credible proof of products' sustainability and healthy properties.



All our surface coatings are Cradle to Cradle certified at Silver level. This certification done by McDonough Braungart Design Chemistry credibly measures achievement in environmental design and demonstrates manufacturer's commitment to preserving a healthy ecosystem.



Limix tiles have been granted Eco Mark - a prestigious environmental certification in Japan.

## LEED Credits



Both Shikkui Surface Coatings and Limix tiles can contribute toward 11 and 12 LEED credits correspondingly in the following categories: MR-1 (Building Reuse), MR-2 (Construction Waste Management), MR-4 (Recycled Content), MR-6 (Rapidly Renewable Materials), IEQ 4 (Low-Emitting Materials) and ID-1 (Innovation in Design). Please refer to our LEED statement for details.

## Safety

Human safety is foremost when choosing interior building materials. Specifying wall and floor coatings that are non-toxic and don't emit VOC gasses - while being durable and fire-resistant - is an important step towards safe buildings.



McDonough Braungart Design Chemistry analyzed all our surface coatings for toxic content and confirmed that they are non-toxic, granting our products the Cradle to Cradle (Silver) certification.



Limestone-based products always exhibit excellent fire-resistance. ASTM E84 granted Class A for Shikkui finishes. Upper temperature limit for Limix is over 600°C.



Our manufacturing practices and technologies are focused on natural materials, and avoid any harmful chemicals. ASTM D3960 for Shikkui finishes proves the product to be zero-VOC. The hardness of Limix tiles is achieved through extreme compression in vacuum using proprietary technology, without any chemical binders or thermal processes.

## Antimicrobial

The material's high alkalinity - up to pH 12 - allows it to naturally kill bacteria, viruses, mold and fungi.



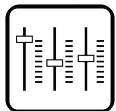
Limix tiles have been tested by Japan Food Research Laboratories for antibacterial performance. The sample surfaces were exposed at 35°C for 24 hours to such bacteria as Escherichia Coli and Staphylococcus Aureus. None of the bacteria survived.



Shikkui finishes have been tested by independent U.S. laboratories for fungal and mold resistance (ASTM D3273+D3274). For 28 days Shikkui surfaces were continuously exposed to fungus (Aspergillus niger, Aureobasidium pullulans and Penicillium) and periodically checked for fungal growth. The whole test period the surfaces indicated a zero fungal growth (ASTM Rating 10).

## Indoor Air Quality

All surface coatings actively contribute to healthier spaces by purifying indoor air from dangerous substances.



Both Shikkui finishes and Limix tiles regulate humidity of the indoor air, thus, providing a comfortable living environment. This is possible due to the highly porous components: limestone, eggshells and a special large-grained diatomite. Contact us for detailed test results.



Absorption and capture of VOC particles and odours is an additional feature of the porous materials, as they absorb and release indoor air.



Limestone-based surfaces are naturally antistatic and prevent dust accumulation. As a result, all Shikkui and Limix surfaces are allergen-free, which serves well for health-care facilities and the hospitality sector.

---

### Tagawa Sangyo Co., Ltd. (manufacturer)

1924 Yugeta, Tagawa city, Fukuoka Pref.

826-0041 Japan

T: +81 905 285 0855 | F: +81 947 44 8484

info@shikkui.com | <http://www.shikkui.com>