

Ceramic Tiles

Ceramic tiles consisting of fired clay usually with an applied glaze are widely used as an interior floor and wall finish in domestic buildings.

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Extraction and manufacture	
Impact of extraction	Extraction of raw materials for ceramic tiles has visual impacts. There is potential for damage to local ecosystems during clay extraction.
Embodied carbon and embodied energy	Embodied carbon of ceramic tiles is calculated at 0.53 kg CO ₂ eq/kg Embodied energy (total) is calculated at 8.32 MJ(NCV)/kg The figures are taken from BRANZ CO2NSTRUCT v1 June 2019. You can download the data and find explanatory details at: www.branz.co.nz/environment-zero-carbon-research/framework/branz-co2nstruct/ Substantially more data is embedded (but not visible) in the BRANZ tool LCA Quick: www.branz.co.nz/environment-zero-carbon-research/framework/lcaquick/
Sourcing	
Material sources	Ceramic tiles are generally imported by sea from Asia, Europe or Australia. Some NZ niche or craft manufacturers use local clays.
Availability	A wide range of tiles is available.
Cost	Up-front materials costs range from low to very high. Ongoing maintenance costs are low.
Transport to site	Tiles can be delivered to site in lightweight vehicles.
Construction/installation	
Health and safety during construction/installation	Protective masks and goggles are required when power cutting.
Ease of construction	Small tiles are time-consuming to lay and finish. Materials can be handled by site labour.
Adaptability	Ceramic tiles are very difficult to replace when adhered to the substrate with grouted joints.
Performance	
Health and safety during life of building	The clay in ceramic tiles is inert. Once fired, glazes are also inert.
Structural capability	Ceramic tiles are not a structural component.
Durability*	20+ years when correctly selected and installed
Maintenance rating	Low
Moisture resistance	Moisture resistance depends on the density of clay biscuit, and can range from poor (porous) to excellent (very dense). In wet areas such as showers, they must be installed over a waterproofing membrane. Grouted joints are not waterproof.

Rot, mould and corrosion	Mould may grow where silicone sealant is used in movement control joints and on grouted joints in damp situations.
Thermal performance	Ceramic tiles have a low R-value. Thin tiles provide a very small amount of thermal mass. Ceramic tiles are suitable as a finish over thermal mass materials such as concrete floor slabs and masonry walls.
Fire performance	Ceramic tiles are non combustible.
Waste disposal/recycling/re-use	
Re-use	Ceramic tiles are generally not salvageable for reuse.
Recycling	Not currently recycled
Waste disposal	Ceramic tiles are inert so can be safely deposited in a landfill.

* with normal maintenance