

Cement-based Plaster

Sand-cement plaster is used in New Zealand homes as a component of wall cladding systems such as EIFS and stucco, or applied to the inside/outside of concrete block construction.

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| Extraction and manufacture | |
|---|---|
| Impact of extraction | <p>Removal of sand may have a visual impact. For river sand, removal may improve river flows and reduce sediment deposition at river mouths.</p> <p>Potential for damage to local ecosystems during raw material extraction.</p> |
| Use of energy and other resources. | <p>Embodied energy for concrete is quoted as 1.5 MJ/kg for cement plaster (based on the figure for cement mortar).</p> <p>There is a high level of wastage when sand is stored and mixed on-site, due to contamination of the sand.</p> |
| By-products/emissions | <p>Cement manufacture releases significant amounts of carbon dioxide into the atmosphere.</p> <p>Cured plaster is relatively inert (see the www.level.org.nz factsheet on paint for coating considerations).</p> <p>Green (uncured) plaster can be detrimental to bare metal (particularly aluminium) – a separation or protective coating must be provided to isolate the metal.</p> |
| Sourcing | |
| Material sources | Cement is made in New Zealand or imported. Sand is obtained from local beaches or rivers. |
| Availability | Raw materials are readily available but local plastering sands vary widely in quality. |
| Cost | Material costs are low but installation costs are medium to high. Maintenance costs are moderate. |
| Transport to site | Sand and cement are heavy to transport. |
| Construction/installation | |
| Health and safety during construction/installation | <p>Safety equipment is required when handling cement (gloves, overalls) or cutting/drilling plaster with a masonry saw or drill (ear muffs, safety glasses, mask and overalls) to eliminate risk of skin irritation and lung damage from dust.</p> <p>Protect skin from the highly alkaline wet plaster.</p> |
| Ease of construction/installation | Cement-based plaster has to be applied to a substrate. The quality of finish depends on materials and plastering skill. |
| Adaptability | Once applied, cement-based plaster is moderately difficult to replace. It cannot be adapted easily. |
| Performance | |
| Health and safety during life of building | Sand-cement plaster is inert, non-toxic, and not prone to off-gassing of volatile materials once it has set. |
| Structural capability | Specifically designed applications may use reinforced cement plaster to strengthen existing masonry buildings. |
| Expected durability (assuming correct installation and maintenance) | 50+ years for well applied and maintained plasters |

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| Maintenance rating | Medium to high – recoating of exterior weatherproofed (painted) plaster is required every 7-12 years (see the www.level.org.nz factsheet on paints for information about weatherproof finishes). |
| Moisture resistance | Cement-based plaster absorbs moisture. It has to be coated when used as an integral part of the weatherskin. |
| Rot, mould and corrosion | Lichens and mosses will grow on damp, weathered surfaces. |
| Thermal performance | Plaster provides low levels of thermal insulation unless a specific insulating material such as polystyrene beads is incorporated into the mix to give a small improvement. Plaster finishes to concrete or concrete masonry provide high thermal mass when exposed to a home's interior and direct warming from the sun (see www.level.org.nz/passive_design). Thermal mass is reduced if the concrete is isolated from interior warmth by insulation. |
| Sound insulation | Limited – adds some mass to the construction |
| Fire performance | Cement-based plaster can be readily incorporated in fire resistant rated construction. |
| Waste disposal/recycling/re-use | |
| Re-use | Cement-based plaster can't be re-used. |
| Recycling | Cement-based plaster can't be recycled but it may be crushed to use as a fine aggregate. |
| Waste disposal | Cement-based plaster can be used as inert and clean fill. |