



GREEN REMODELLING -TILE IS A HEALTHY ALTERNATIVE

By Anthony Stock

"Cactus" by Marazzi

The debate about which products are 'green' is a fascinating one. In the United States architects like Cassandra Adams and a number of regulatory authorities rightly assert that because products like ceramic tile and natural stone are heavy, there is a greater consumption of energy involved in their transportation, which has an undesirable effect on global warming.

Growing concern about health issues in our built environment is long overdue. Ironically a considerable amount of debate about these issues emanates from Australia and the United States; two of only a handful of countries that refuses to sign the Kyoto protocol, which is designed to reduce greenhouse gas emissions.

This strange contradiction should not detract from the fact that some local developers are trying to source materials from suppliers who are located in close proximity to specific projects.

Conversely a growing number of major manufacturers have opened tile production plants in or near to highly desirable markets.

For example, in 2004 Italian manufacturers produced 600 million meters of tile in Italy and 100 million meters in factories located overseas.

Ceramic tiles are manufactured in numerous countries and on every continent. Transportation of tile obviously has an impact on the environment. However, the industry must take positive steps to alert specifiers, developers and consumers about the major benefits associated with the use of tile, that in my opinion heavily outweigh the negatives.

In this article we examine the pros and cons of a variety of finishing materials that are utilised in commercial and residential environments.

Before we focus on a select group of products it should be stressed that while tile manufacturing processes have an effect on the environment, tile is an inert material, which is produced from naturally occurring materials that can be safely recycled.

Some assessments of a material's impact on the environment only evaluate factors associated with production, transportation and issues related to cleaning and maintenance. Surely any kind of effective Life Cycle Assessment (LCA) needs to look at what happens to materials when their useful life is over. How are they disposed of and effectively recycled?

Tiling tool manufacturers like Germans Boada manufacture machines that rapidly and effectively crush used tiles into material that can be used as 'road fill' or 'hard fill'. Vinyl or carpet can not be recycled in this manner.

As Peter Halliday stated in *How Green Are Ceramic Tiles?* (Tile Today issue #46), "to be truly useful, any measurement of environmental impact should be calculated over the materials entire lifecycle. It is pointless to say something has a low impact during the manufacturing process if it cannot safely be re-used or incorporated back into the environment without impact!"

THE BENEFITS

Once a decision is made to remodel in the home or in the office, there are a variety of factors to consider. Presumably the overall objectives in any green remodelling project are:






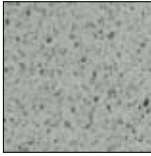
- The creation of a living or working space that is trendy, functional, efficient, comfortable and healthy.
- One should be seeking to reduce costs by making energy savings by cutting monthly costs
- It's essential to make long term evaluations of products in terms of performance, cleaning and maintenance programmes.

Many Australians remodel their homes because family members are asthma or allergen sufferers. By choosing blinds in reference to drapes, leather upholstery rather than fabric and tile or timber instead of regular carpet they significantly reduce the impregnation of soft materials by dust mites and other agents that can trigger allergic reactions.

Choosing materials that are relatively easy to clean and maintain saves time and money and improves air quality.

Green remodelling is not something that one can do in one location within the home or office. The objectives are to maximise fresh air, ensure the supply of abundant natural light and ensure that floor, wall and work surfaces are clad in resilient, easy clean materials that are safe.

Slip resistance factors must be considered carefully. Visitors to your home can take legal action if they slip, trip or fall whilst they are on your premises.

AREAS OF APPLICATION						
	CERAMIC TILE	NATURAL STONE	TIMBER	VINYL	CARPET	ENGINEERED STONE
INTERNALLY	✓	✓	✓	✓	✓	✓
EXTERNALLY	✓	✓	✓			
BENCH TOPS	✓	✓	✓			✓
WALLS	✓	✓	✓			
FLOORS	✓	✓	✓	✓	✓	✓
WET AREAS/SHOWER ENCLOSURES	✓	✓				
POOLS/TOTAL IMMERSION	✓					

Every effort must be made to use surface finishing materials that will not harbour moulds or allergens and will not release toxic chemicals into the living or work space.

CERAMIC TILE

The Ceramic Tile family includes a variety of products: Monocottura (single fired floor and wall tiles), Bicottura (twice fired wall tiles), Glazed Porcelain, Terracotta, Polished and Unpolished Porcelain and Klinker materials.

Positives: Ceramic is the most flexible product, it has the widest range of applications, which include installation in shower enclosures and swimming pools, where the material is totally immersed.

Formats range from miniscule cubes of mosaic to giant slabs of polished porcelain – 1800 x 1200 mm, or even larger.

A variety of textures and finishes are available for internal and external locations. Colours vary from minimalist imitations of stone to the hot and exotic.

While polished porcelain and terracotta require sealing, general maintenance of these products is extremely simple. Simply sweep with a soft broom, and mop lightly using a minimal amount of water.

Concerns about discoloured or cracked grout can be overcome by use of epoxy grout. Modern epoxies are easy to use and are less expensive than they used to be.

Negatives: We import tiles from numerous countries. Materials from Asia are generally cheaper than tiles sourced from Italy and Spain. In recent times polished or glazed porcelain tiles have gradually superseded monocottura tile. Most manufacturers and retailers recommend that polished porcelain is sealed. Glazed porcelain and monocottura do not require sealing.

The variance in price between European and Asian products can be difficult to explain to consumers who are becoming more discerning. The need to seal and the variable quality of some polished porcelain materials is making consumers wary about the maintenance of tile, which has long been one of the traditional strengths of the product.

In broad terms polished porcelain is high tech material that has the

lowest possible porosity values, typically 0.5 percent or below. Some materials manufactured in China that are branded as polished porcelain actually have porosity values in the region of 3 per cent. This enables contractors in China to lay the materials in sand and cement in preference to thin-set adhesive. Clearly these materials do not fully comply with the traditional description of ‘impervious stoneware’ tiles:

‘Dust pressed ceramic tiles with water absorption levels 0.5 per cent and high mechanical and chemical characteristics.’

This type of misperception can result in increased staining of materials that are more porous than one expects and are not in the true sense impervious polished porcelain.

STONE

Positives: Like tile, stone has numerous applications, including vanity and kitchen bench tops. The wide availability of contemporary high performance penetrating sealers permits use of stone in many commercial and domestic locations. Marble is porous and like several popular stones it requires careful sealing, treatment and maintenance.

The durability of stone may mean that the actual cost of the material may wind up being less than that of a product that is cheaper but has a shorter life span.

Stone is perceived as a product of distinction that will add value to one’s home. Significantly more tile outlets are marketing stone tiles. Home-owners expect to pay more for these unique products.

Negatives: Much of the global environmental impact of using stone relates to how quarries are managed. In Australia, quarry rehabilitation is a standard condition in any mining lease that permits extraction of stone. This is not the case in several other countries.

There is a perception in the tile industry that retailers are to some degree inhibited by a shortage of staff who have sufficient product knowledge. Knowledge about selection, installation, care and maintenance of stone is even harder to come by.

TIMBER

Positives: In the United States the Green Building Initiative is led by a former timber company executive. Not surprisingly this particular organisation argues that wood takes less energy to manufacture than



Ceramic Tile functions internally and externally. Check that your selection has a slip resistant surface and is frost resistant. (Image courtesy of Marazzi)

competing materials, such as steel and cement.

In Australia we have some wonderful timbers, which look natural, warm and inviting. Timber is relatively easy to lay. General maintenance is a moderately simple task. From an aesthetics perspective timber does not date, and blemishes or imperfections are often difficult to spot.

Another surprising factor in favour of timber is that it can be quickly covered over with other flooring – tile, stone, carpet or vinyl. In many instances these materials are laid over a separating layer. In time a new tenant or owner can remove the tile and backer board, or the carpet, and with minimal remedial work in the case of carpet, they can re-instate the original timber floor.

Negatives: The logging of timber directly affects air quality. In the United States various lobby groups and associations demand that only timber, which is sourced from sustainable timber resources, is specified. Determining if a resource is sustainable is not easy, given that most of the industry groups or so called independent bodies who endorse the use of timber and other products, have a vested interest in one product or another.

Sorting the green from the green-wash is a real challenge. Timber, even dense timbers like Tasmanian oak are highly susceptible to impact damage. Drop a conventional telephone (as I have done) on a timber floor and it will frequently leave a visible pit or indentation. Stiletto heels can ruin a floor in a matter of minutes.

In Green Building 101: Materials and Resources, part 1 by Piper, the point is made that the word 'sustainable' is open to 'interpretation'. Piper adds, "Any manufacturer and a good marketing team can call their product 'green'."

In the Americas a Brazilian hardwood Ipe has gained favour because of its suitability for decking and exterior cladding. Piper points out, "Just

because a timber is long lasting does not mean it's a sustainable choice."

In its natural habitat Ipe is covered in several feet of water for much of the year, which imbues the material with its hardness and resilience.

Timber is particularly difficult to uniformly label as a green product.

VINYL

Positives: There are vinyl tiles and luxury vinyl tiles (LVT), as they are known in the United States. Vinyl, sheet or tile, is a product that primarily imitates the look of other naturally occurring materials like tile, stone or timber.

Companies like Amtico produce excellent hard wearing vinyl tiles that truly stand the test of time. However, the term Luxury indicates that the price is frequently higher than the cost of high quality ceramic tile and some natural stone products.

Vinyl is easy to clean and maintain.

Negatives: Vinyl, which should not be confused with linoleum, has suffered as a result of recent research that "raises questions about vinyl's impact on human health". (Green Home Remodel.) The same source also claims that "residential grade vinyl sheet flooring is composed of paper topped with a very thin layer of colour or pattern. In an instant, a dropped knife or sharp appliance edge can cause irreparable damage."

Many vinyl products may appear to be a viable cheap alternative flooring, yet the initial gain may only be temporary when one is faced with replacing tired flooring before its imagined use by date.

CARPET

No one can deny that carpet is the most comfortable floor covering. Carpet is king in the U.S.A. where families move home frequently and floor coverings are to some extent disposable.

According to SPOP the Sustainable Practices and Opportunities Plan, "1.8 million tons of rugs and carpets are sent to landfills each year." SPOP advocate selection of a "resource efficient carpet", given the product's "relatively short expected useful lifetime."

Organisations that assess the merits of green products evaluate the potential of recycling specific materials.

The good news is that some companies that "traditionally used nylon face fibres are now offering carpet with either post industrial or a combination of post industrial and post consumer content."

In other words, they are recycling.

Some U.S. manufacturers have gone as far as taking complete responsibility for the carpet.

Carpet can now be 'leased' and maintained on a monthly basis. Leased carpet is often recycled at the end of its useful life span.

Negatives: While some manufacturers have made great efforts to produce carpet that is easy to clean, the fact remains that carpet provides a safe haven for dust mite and other airborne allergen triggers.

The Australian Government web site Health Insite states, "the prevalence of asthma is amongst the highest in the world: between 14 per cent and 16 per cent of children and 10 per cent and 12 per cent of adults, have asthma."

The site also confirms, "although it is not a major cause of death, asthma is one of the most common problems managed by doctors, and is a frequent reason for hospitalisation, especially boys."

A report conducted in Melbourne by Sporik and others, Journey of Allergy and Clinical Immunology concluded that "having a bedroom floor without carpet is associated with less dust mite material on floors

and that dustproof bedding covers reduce dust mite from bedding, whilst shampooing carpets with a mite killing material made no detectable difference. Dust from uncarpeted floors had one-tenth of the mite material concentration found in carpeted floors ..."

In the report's conclusion the following statement was of particular interest: "All over the world people continue to sell mite-killing materials, and people continue to buy them in preference to doing the two things known to help most, covering the bedding with appropriate coverings, and removing carpets."

Increased consumption of tile, timber and laminate in all areas of the home indicate that consumers are heeding the message.

ENGINEERED STONE

Positives: This contemporary material is produced from quartz crystals and ground quartz. Pigments and polyester resin are combined and poured into a mould to form a dense slab with granite like attributes. Unlike granite, engineered stone is man-made, so it can be produced in variable colours that are not found in naturally occurring granites.

The material is durable and difficult to scratch, cut or stain. Engineered stone tiles are available, but it is principally employed in Australia as kitchen bench top material. No sealers are required. Engineered stone is extremely popular.

Negatives: Engineered stone is made from non-renewable resources. Some advocates of natural stone object to odours that emanate when the material is being processed. Associations like the Marble Institute of America and the Australian Stone Advisory Association will conduct some investigations into the characteristics of a variety of engineered stones.

This material should not be used externally because sunlight will change its colour.

CONCLUSION

With respect to indoor air quality and recycling, tile and stone appear to be the best options. These materials are also extremely durable.

Green concerns should not end with material selection. The true exponent of green building values needs to think about the adhesives, sealers, grouts and other materials that are employed to complete installation.

Some floor coverings, e.g. certain types of carpet can emit volatile organic compounds (VOC) into the atmosphere, which are potentially harmful.

While tile and stone emit few, if any, emissions one has to check if the sealer used on marble or polished porcelain poses any kind of health risk.

The relative durability of a floor or bench top material, is a prime consideration. Well chosen materials will significantly reduce maintenance and replacement costs. Inexpensive products are not the answer, particularly in areas subjected to heavy foot traffic. Environmental benefits flow from the fact that resource extraction is reduced and there is a reduction in the energy consumed in relation to

manufacturing and installation.

Some industry members may thumb their nose at the importance of green building issues. They do so at their peril.

The Building and Construction Interchange (BCI Australia) recently reported: "There can be little doubt that the property sector has taken sustainability seriously for a number of years and that the debate on green building is in fact gaining momentum."

Simon Carter, National Leader of Innovation at Colliers International, major property services provider argues that the property sector's drive for sustainability is lopsided.

"From the outset the Green Building Council of Australia has focused on the supply side of the market, namely property owners and building designers. They've done a stellar job in bringing people on the supply side of the market on board and developing their Green Star certification tools. But they have been inactive when it comes to addressing the demand side of the market, the tenants that ultimately create the value for investing in better environmental performance."

Nevertheless, the BCI report that by 2011 "the portion of the more environmentally conscious generation Y in the workforce will have risen from 20 per cent to 40 per cent."


The Housing Industry Association (HIA) GreenSmart Code of Practice and similar initiatives will become more important.

The national GreenSmart awards were held on August 31st at the Hilton, Sydney. We will report on the outcome in our November issue.

In time, we will become more aware of every factor that impacts on our fragile environment. A true study of these

important issues needs to address a multitude of issues. For example the impact of transporting materials via rail versus road. A recent study that examined steel on steel and rubber on bitumen discovered efficiencies of 8 to 1 in favour of steel. Therefore transportation by rail is preferable to road.

Growing numbers of specifiers and consumers will begin to ask tough questions about the materials they select. Manufacturers of all floor finishes need to act now.

The tile industry needs to be aware of these developments. Every effort should be made to promote the merits of a time-honoured product that has many advantages over competitive floor and wall finishes. Too many resellers are engaged in price wars instead of selling the long term benefits of tile, which can truly be described as an inert product that will provide great service over a long period, yet requires minimal maintenance. 

REFERENCE MATERIAL:

HIA GreenSmart Materials

Green Home Remodel, Seattle Public Utilities

Sustainable Building Program

Green Stone & Tile Recommendations, Green Home Guide

The Asthma Foundation

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