



Figure 1



Figure 2

# Ceramic Facades

## The Feature for the Future

### Recent Australian Developments

by **Gary Jones and Peter Halliday**

*In issue no. 40 of Tile Today (2003), Peter Halliday reviewed various ceramic tile cladding systems, as part of a series of articles that examined opportunities to grow the tile industry.*

*Gary Jones reports, that Australian architects are beginning to appreciate the potential of employing large format ceramic tiles, as an effective way of cladding the facades of old and new buildings.*

*Gary Jones reminds us that ceramic tile has a long history as a cladding material. He also reveals that a number of interesting façade projects have recently been completed in Australia. A number of other projects are in progress.*

*We include extracts from Peter Halliday's original article to provide additional detail related to installation processes.*

The future of ceramic facades is a testament to the durability of the ceramic tile as a building material, from the Ancient Egyptians through the Sumerians and onwards man has trusted his most precious memories to the everlasting beauty of ceramic materials.

Today the reasons for utilising tile as cladding may not be so esoteric as they were in those far off days. They have much more to do with the practical realisation that a façade clad in tile is resistant to attack from an increasingly hostile polluted environment.

In years to come ceramic tiles in their various forms will no doubt come into their own, providing aesthetically pleasing yet durable façades able to withstand the rigours of our city life.

Whether, it is a renovation of an existing building or the envelope for a new building, ceramic tile has vast possibilities which are not provided by any other materials. Modern tile is colourful, self cleaning, durable and even changeable. We illustrate a number of different solutions to the façade question which have been implemented in and around Sydney utilising Buchtal ceramic cladding systems.

### Renovation

What a change from the old "NSW Government Printing office" to the "Global Switch" building, an entire re-cladding of a listed building using mechanically fixed tiles and heritage colour matched tiles fixed with ceramic tile adhesive. **(Figures 3,4,5 & 6)**

Several new projects have been completed in the "Rocks" area of Sydney where materials must comply with requirements of the various controlling authorities. A block of units in Windmill St, utilise the Keraion "Quadro" system with factory prepared special pieces all invisibly fixed. **(Figures 7 & 8)**



Figure 3



Figure 4



**Figures 9 & 10** focus on use of two colours fixed with the Quadro System by Buchtal as a design feature on the fly tower of the Sydney Theatre.

## Ventilated Facades

“Ventilated facades” are so named because of the creation of an air space outside the load-bearing wall of a building. This is obtained by constructing a curtain wall some distance in front of the load-bearing wall itself. One of the advantages of this curtain wall is the protection it provides to the building from atmospheric agents without any thermal transfer to the building structure. This can reduce the volume of perimeter air-conditioning required, guaranteeing energy savings on heating and cooling. The natural ventilation produced by a chimney effect together with the spaces in the external cladding allow the removal of heat and humidity away from the building structure. An open joint system, with integrated waterproofing treatment to the structural wall behind it, can also be referred to as a rain-screen.

The Italian manufacturer Floor Gres says the technical characteristics of the curtain-type ventilated facade depend on the following parameters:

1. Operating loads: they are the weight of the elements themselves (uprights and transverse metal framework), the permanent overloads (porcelain stoneware tiles or sheets) and the accidental overloads (wind and movement of the structure).
2. Movement and deformation caused by wind thrust, the static load, seismic movement, thermal expansion.
3. Thermal expansions: in modern buildings where the inside temperature remains constant, outside there are fluctuations of up to 50°C (this is one reason why cladding not directly attached to the wall is considered beneficial).
4. Water tightness and removal of condensation. By adopting open joints, the condensation is removed, thanks to the natural ventilation and to the chimney effect, making this system better than sealed joints.
5. Thermal insulation; the transmission of heat is carried out by conduction, convection and radiation; the curtain wall deadens this transmission by carrying out an “umbrella effect”. The insulation may be improved by using materials such as impermeable foam polystyrene, fireproof polystyrene or impermeable mineral fibre.
6. Soundproofing; soundproofing is strictly connected with the materials used in the construction of the structure. Insulating panels and correct insertion of the shock absorbers in the brackets of the curtain wall structure improve the building’s soundproofing.
7. Fire resistance: porcelain stoneware is fireproof, class 0.

Ventilated facades are of growing interest throughout the world as environmental legislation, energy costs and ongoing maintenance costs are taken into account. The porcelain stoneware tiles or panels used in ventilated tile facades are all light-fast, UV and frost resistant. They also offer the following advantages over ceramic cladding stuck directly onto the building:

- Reduced risk of cracking and separation from the building
- Ease of installation
- Ease of maintenance
- Can be self-cleaning
- The ability to gain access to each individual tile or slab



Figure 5



Figure 6

**Figure 1** Depicts the famous Ischtar Gate (575 BC). Many archaeologists describe these materials as the first glazed tiles, utilised to clad the facade of King Nebuchadnezzar’s Palace in Babylon.

**Figure 2** focuses on the new facade of St Margarets Hospital in Surry Hills, Sydney. **Figure 13** illustrates the original facade.



Figure 7



Figure 8



Figure 9

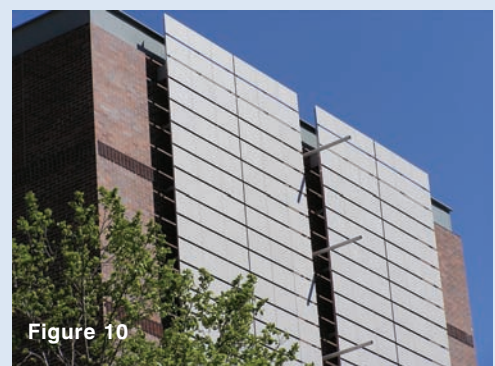


Figure 10





Figure 11



**Figures 11 & 12**  
**“Towns Place East”,**  
**office development**  
**features two colours in**  
**the “Quadro “ system.**

**New technology which**  
**incorporates Titanium**  
**Dioxide in the surface of**  
**glass and tile has**  
**created the concept of a**  
**self cleaning building. All**  
**that is required is**  
**sunlight and rainwater.**

**Images courtesy of**  
**Capital Tile Centre,**  
**Canberra.**



Figure 13



Figure 14



Figure 15

**Figure 14 & 15 Illustrate the Government Offices in**  
**Lithgow NSW which utilise the KeraTwin tiles in**  
**both plain and structured surfaces.**

## Different Systems

Many ceramic tile manufacturers promote different versions of ventilated facades. Buchtal, Marazzi, Graniti Fiandre, Floor Gres, NBK and Il Palagio are just some of the manufacturers specifically designing products for use in facade systems. The different systems all comprise of a ceramic face separated from the building by an air gap of around 50mm, protecting the building surface from atmospheric agents. A weight-bearing substructure of lightweight posts and rails that are usually made from stainless steel or marine grade aluminium, supports the ceramic face. The posts are fixed to the building substructure by means of brackets. Cross rails attach across the posts. The tiles are then mechanically fixed onto the cross rails allowing a 5-10mm gap between each tile to assist ventilation. Ventilating tile cladding systems can be divided into two groups; either visible or concealed fixing. Visible fixing is generally the cheaper method. There are a number of smaller extruded terracotta and stoneware tiles also made for facades. The fixings for these tiles are different in that they fix from the sides. Metal brackets with protruding lugs fit into the extrusion holes to attach the tile unobtrusively yet securely.

Buchtal Ceramics, now part of Agrob Buchtal, was the first company to develop the large format 60x60cm ceramic facade tile. That was nearly 30 years ago. A decade later, many other European manufacturers followed the Buchtal lead. Buchtal's years of experience however, particularly with the substructure and fixing methods, have ensured that they remain the market leaders. All Buchtal's glazed tiles now come with Hydrotect coating that is applied in another firing, making the tile naturally self-cleaning whenever it rains. The cost saving on cleaning over a building's life is considerable. Gary Jones, Managing Director of Capital Tile Centre, is agent for Agrob Buchtal facade systems in Australia and parts of Asia. He has been involved with Buchtal for the past 25 years. He says Buchtal's facade systems continue to undergo refinement and development. He describes the Buchtal system as the Mercedes of ventilated tile facades. Buchtal is so confident in their systems that they offer a lifetime guarantee on the tiles and the system. In 30 years, Gary has not heard of one tile being replaced.

Engineers love the tile facade system according to Gary Jones. The Buchtal KerAion system weighs just 18 kg/m<sup>2</sup> with no possibility of shear. The thickness of the Buchtal KerAion stoneware tile is 8mm. Other systems with tiles 12mm thick weigh around 25 kg/m<sup>2</sup> with some terracotta systems 18 mm thick going as high as 40 kg/m<sup>2</sup>. This must be taken into account when planning the building or renovation. Any substrate that will accept an aluminium bracket to hang the vertical posts is suitable for this technique.

In Switzerland, stainless steel is used for the posts and cross rails of the frame. In Australia, marine aluminium is used. It is lighter than stainless steel, cheaper, and the thermal expansion of aluminium is still extremely low. The aluminium frame material is produced locally with only the tiles being imported.

## Projects in Progress

Currently there are further projects under construction in George St, Hickson Road and Macquarie University in New South Wales, featuring a variety of the Buchtal cladding systems which illustrate the versatility of the product and the ways in which it can be utilised.

St Margaret's Hospital Redevelopment in Surrey Hills features glazed Keraion panels in a special size 956mm x 956 mm and the clients custom green colour logo as a feature on gloss white tiles, these also have the "Hydrotect" protection system, ensuring that the tiles retain their crisp clean looks for the life of the project. **(Figures 2 & 13)**

In addition to the benefits of using tile outlined herein there is the prospect of changing the colour and appearance of a building in a very short space of time. **TT**