



Dubai Investment Park
United Arab Emirates

AceWall™

Injection-Moulded Full-Height Wall Panels

*A development of AceWall International Pty Ltd
Adelaide, South Australia*

AceWall™

AceWall™ is a fibre-reinforced, water-resistant, gypsum-based, non-load-bearing wall panel, designed for external and internal applications within modern residential, commercial and industrial low-rise and high-rise developments. The product is set to revolutionize the construction industry due to its low product and installation cost, rapid installation, high strength-to-weight ratio, advanced sound/thermal/fire performance and strong eco-friendly characteristics

Advantages

■ Product:

- Light Weight
- Low Cost
- Rapid Installation
- High Quality Finish (smooth, flat, crack-free)
- High Resistance (thermal, sound, fire, earthquake, termite, water)
- Low Carbon Footprint (low embodied energy, abundant natural materials)
- Recyclable (re-calcination)

■ Factory:

- High capacity (one panel per minute)
- High energy and material efficiency
- Advanced computerized, automated operation
- Modular (expandable, re-locatable close to major development sites)
- Eco-friendly

Materials

- Gypsum (Beta quality)*
- Water
- Fibre-glass (short fibre)
- Waterproofing Agent
- Retarder
- Activator
- Optional Infill (e.g. concrete, perlite)

* Can be obtained by calcination of industrial waste material such as "flue gas" or "phospho" gypsum

AceWall™ Panels

- Pre-fabricated non load-bearing
- Hollow section (filled or unfilled options)
- Precision moulded construction
- Fibre-reinforced water-resistant gypsum
- Advanced perlite infill option
- Dimensions
 - Height - 2.1 m to 3.6 m
 - Width - 60 cm
 - Thickness - 12 cm
- Nominal Weight
 - 38 Kg per sq.m. (unfilled)
 - 45 Kg per sq.m. (e.g. perlite infill)



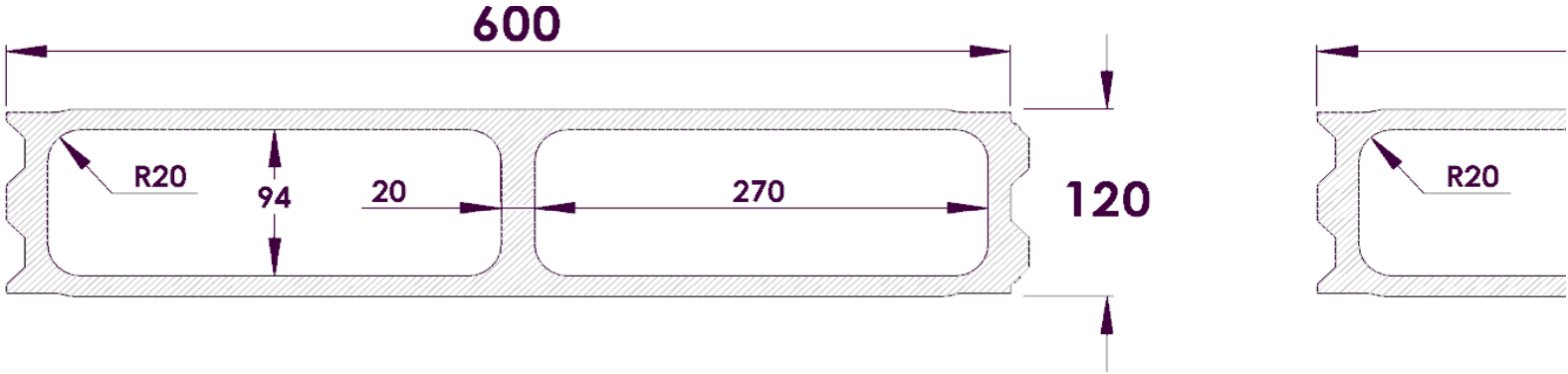
AceWall™ Panels

- Precision cut to tight tolerance
- Rapid installation
 - 250 sq.m. per 8 hour shift
 - 7 installers
- Tongue and groove joints
 - Integral spacing control
 - Plaster adhesive in joints
 - Flush finishing
 - High quality finish
- No rendering required
 - External: Ready for texture coating
 - Internal: Ready for painting or tiling



AceWall™ Panel Section Detail

All dimensions in mm



AceWall™ Panel - Performance

Characteristic	Single Partition Wall Unfilled	
Thermal Insulation (ASTM C518-4)	Resistance	0.245 m ² .K/W
	Conductivity	0.489 W/m.K
Sound Insulation (AS 1191)	Sound Rating	Rw – 31
Fire Resistance (AS 1530.4)	Insulation	134 mins
	Integrity	134 mins
	Adequacy	142 mins

AceWall™ Panel – Performance

(Cont'd)

Property	Single Partition Wall Unfilled
Uni-Axial Compressive Strength	100 kN/m
Uni-Axial Tensile Strength	28.8 kN/m
Water Absorption	< 5% by weight after 24 hour immersion
Mohr Hardness	1.6

AceWall™ Panel - Physical

Parameter	Single Partition Wall Unfilled
Width	0.60 m
Height	2.40 m to 3.60 m
Thickness	0.12 m
Tolerance	± 0.5 mm
Weight per sq.m.	38.0 Kg
Panel weight (3 m height)	68.40 Kg
Cavity cores per panel	2
Cavity volume per panel (3 m height)	0.151 m ³ (151 litres)
Cavity volume per sq.m.	0.084 m ³ (84 litres)
Drying shrinkage	None

Strength Test

(Demonstration at Dubai Festival City, 2008)

- Practical test to demonstrate the strength of the panel:
 - Steel bar fixed to an installed demonstration wall
 - Fixings – 4 x 6mm fixing screws (HILTI screw locking devices)
 - Man weighing 85 Kg successfully supported

Note:

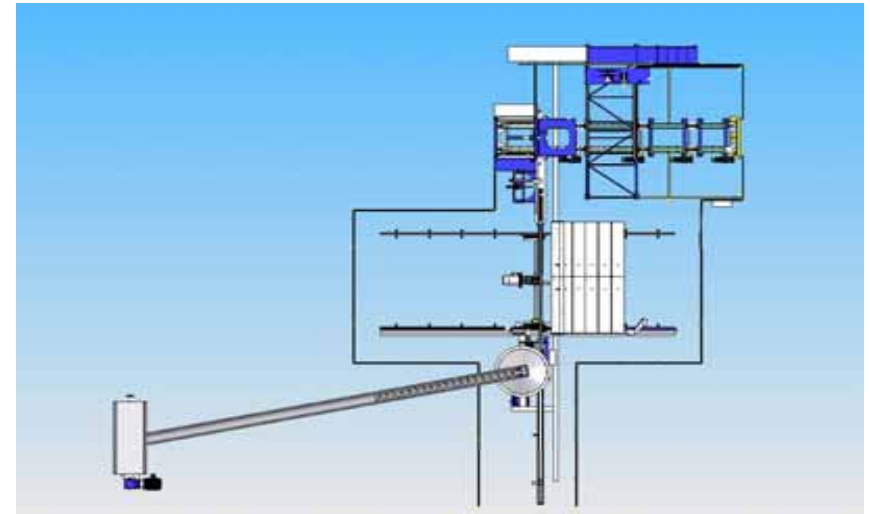
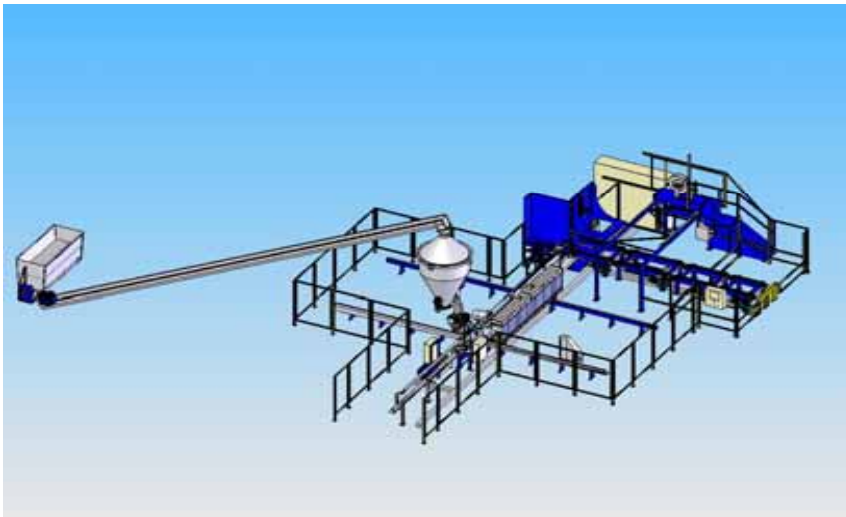
The panel is capable of supporting the weight of a standard TV, central heating or air conditioning units, but will not support heavy wall-mounted bathroom fixtures (e.g. toilet, bidet, washbasin) unless these are also supported by the floor. If a wall suspension is required the solution is to make a local break in the wall and backfill locally with a concrete mix

AceWall™ Production Plant

AceWall™ Factory

(Currently installed in the Dubai Investment Park)

- Precision moulding process
- Computerized operation
- Advanced automation
 - Process control
 - Palletization
 - Process alerts

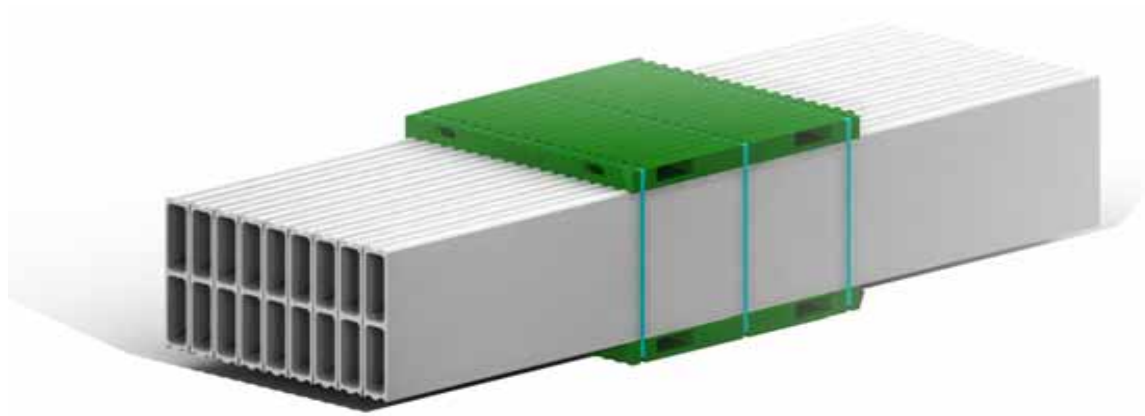


- Capacity
 - 1 panel per minute
 - 750,000 sq.m. per year
- Environmentally friendly
 - No emissions

AceWall™ Factory

- Advanced PLC-based automation
- Full built-in fault monitoring and diagnostic management
- Control, monitoring and diagnostics possible via internet-link
- Full chemical and mechanical process control
- Full safety interlocks and sensors
- Designed for 24/7 operations
- Rapid automated production of high quality panels (one per minute)
- Free or forced air convection drying of panels prior to shipment

AceWall™ Panels (9) - Palletized



Environment

Carbon Emissions

- Kyoto Protocol – Carbon Credit mechanism adopted by 170 countries
- Low carbon footprint (embodied energy) of AceWall™ product due to:
 - *Extraction of raw gypsum materiel (can use industrial waste gypsum products)*
 - *Production process, local transportation to site, installation process*
 - *Full recyclable disposal at the end of useful life (re-calcination)*
- Avoidance of brick, cement and concrete produced by burning of fossil fuels
- Brickworks give rise to soil erosion caused by mining of clay
- Gypsum based building materiels now preferred in countries such as China
- AceWall™ Factory:
 - *Environmentally friendly*
 - *Gypsum may be extracted from industrial waste (flue gas or phospho gypsum)*
 - *No pollution, no water or materiel waste (mould cleaning water recycled)*
 - *No gas or chemical emissions*
 - *Low noise level (no ear protection required)*
 - *No sewerage disposal necessary (other than for workforce and office)*

Australia – Energy Consumption

- Upto 10% of Australia's annual energy consumption has been attributed to energy embodied in the construction of residential buildings (includes materials and construction process)
- Estimates suggest that the embodied energy in a current standard residential building construction is equivalent to 15-20 years of occupational energy
- The Australian materials industry accounts for 20% of the national energy budget each year
- Since Australia mostly uses fossil or solid fuel as its energy source there is a direct correlation between Embodied Energy and CO₂ emission
- Embodied Energy is therefore an important component of the life-cycle energy use attributable to residential buildings in Australia
- ***AceWall™ has significantly lower Embodied Energy than its counterparts such as concrete, cement and brick***

CO₂ Emissions - A Comparison¹

AceWall™ technology compared to brick veneer as external wall cladding of residential buildings in Australia

Product	Drying	Embodied Energy	CO ₂ Emission
AceWall™	Air Dried	190 MJ/m ²	21.8 Kg/m ²
AceWall™	Drying Room	240 MJ/m ²	25.7 Kg/m ²
Brick Veneer	N/A	555 MJ/m ²	58.4 Kg/m ²

It is estimated that Australia-wide use of AceWall™ type product instead of brick veneer for external cladding of residential dwellings would result in a saving of 63% of applicable CO₂ emissions

It is further estimated that this saving equates to the total amount of emissions liberated in a year from domestic consumption (heating, cooling and cooking) of all households in South Australia

¹ – Data source: Ecologically Sustainable Development: Approaches in the Construction Industry
Robert Omahen, Regensburg University, 2002

Market Segments

- **Internal partition walls**
 - Internal partition walls for high rise developments, new housing and industrial projects as well as upgrades to existing premises, including offices, factory premises, railway stations, hospitals, schools, airport terminals, etc

- **External walls for housing and low rise buildings**
 - Housing and building development projects which traditionally use textured concrete panels or brick veneer for external wall solutions

- **Feature walls**
 - The panel has a number of diverse applications such as external border or feature walls for residential and non-residential projects

Product Cost Advantages

- ***Light Weight*** (reduced craneage, foundation costs)
- ***Precise Dimensions*** (certainty in design and construction tolerances)
- ***Reduced Construction Time*** (30% of conventional blockwork)
- ***Reduced Site Labour*** (50% of conventional blockwork)
- ***Elimination of Rendering*** (no rendering costs)
- ***High Strength-to-weight ratio*** (construction material efficiency)
- ***Reliable Supply*** (abundant raw material)
- ***Minimal Training*** (avoids blockwork and rendering skills)
- ***Reduced Material Holding*** (rapid “delivery to installation” time)
- ***Reduced Project Management*** (simplified logistics and skill interaction)
- ***Carbon Credits*** (avoidance of penalties for excess carbon emissions)

= Reduced Cost!!