Building a Cleantech Future

Sym-Wall®

Product Overview

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Sym-Wall® is …

… a fibre-reinforced gypsum-based cavity wall panel

… designed for modular on-site and off-site methods of construction

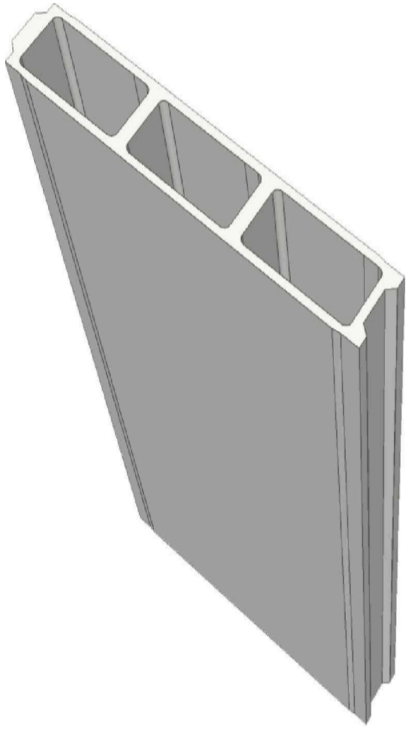
… produced with standard panel thickness of 100mm

… option to embed services, insulation and reinforcement

… suitable for a wide range of internal and external wall applications

… set to revolutionize the construction industry due to its

- ***low manufacturing and installation cost***
- ***rapid and easy installation***
- ***high strength-to-weight ratio***
- ***advanced fire/sound/thermal/water-repelling performance***
- ***strong environmental credentials***



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Advantages

- *Single module replacement to stud and plasterboard*
- *High performance (fire, acoustics, thermal, water, mechanical impact, loading)*
- *Dry semi-skilled installation method*
- *High quality surface finish (precise, smooth, ready-to-paint)*
- *Full and split panel variants for internal and external cladding applications*
- *Low cost (automated production plant, ease of installation)*
- *Low carbon footprint (low embodied energy, use of waste gypsum)*
- *Recyclable (re-use in panel manufacture, no waste, no landfill)*
- *Suited to off-site factory-based volumetric build*
- *Suited to on-site modular build methods*

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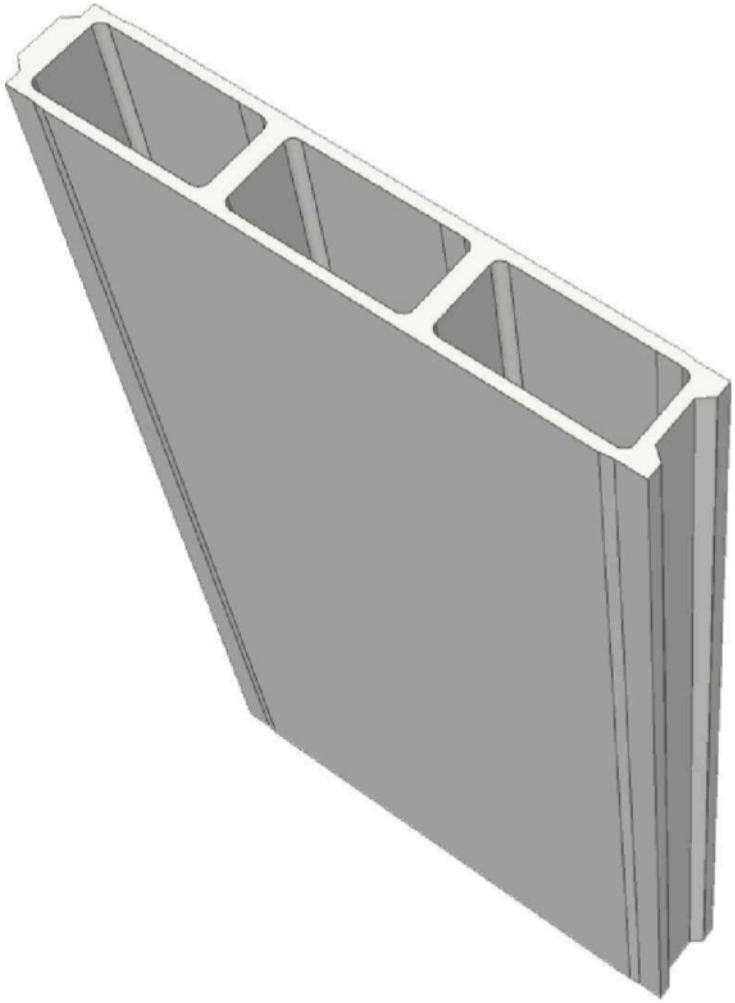
Panel Description

- Sym-Wall® is a full height wall panel with standard width of 600mm, wall thicknesses of 100mm (full) and 50mm (split) and custom-defined length/height from 2100mm to 3600mm (to a tolerance of 1mm)

- The panel is produced with vertical "tongue and groove" joining surfaces with moulded "tape" recesses and internal cavities to reduce weight and serve as internal conduits for the installation of services, insulation and reinforcement

- The panel is produced to tight dimensional tolerances and has smooth external surfaces which do not require skimming or rendering prior to final coating/painting



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Performance Summary

- Fire:
  - Insulation – 90 minutes
  - Integrity – 120 minutes
  - Adequacy – 120 minutes
- Sound:
  - Partition (single panel): R_w (C; Ctr) 31 (-1; -2) dB (lab test)
  - Party (double panel with 50mm gap): Dntw + Ctr 52 dB (in situ test)
- Thermal:
  - Party (double wall with 50mm gap): U-Value - 0.15 $W/m^2.K$
  - Sym-Shield™ - U-Value – 0.12 $W/m^2.K$ (analytical value)
- Water Resistance:
  - Less than 5% take-up after immersion – Class H2

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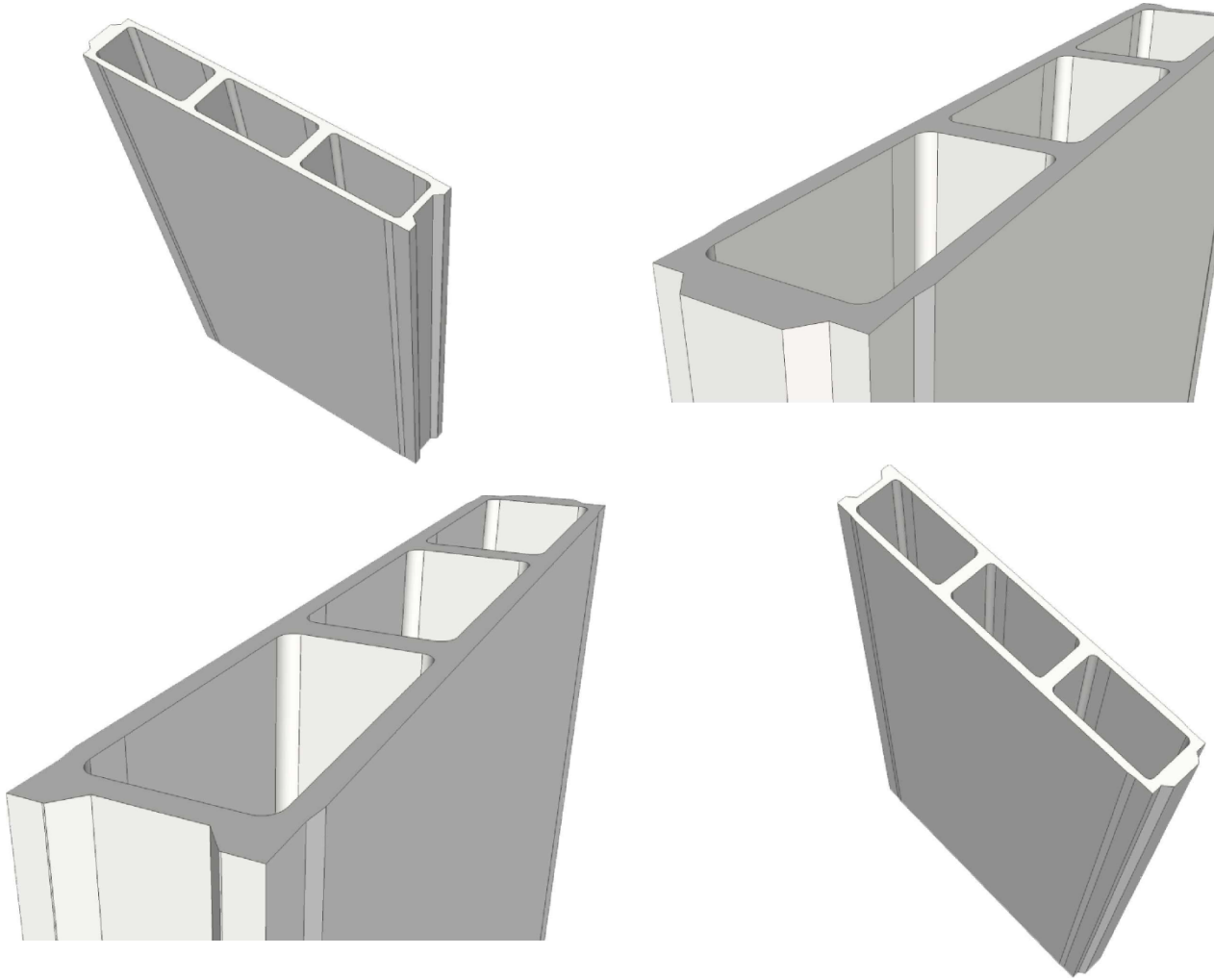
SW_{100} – Full Panel



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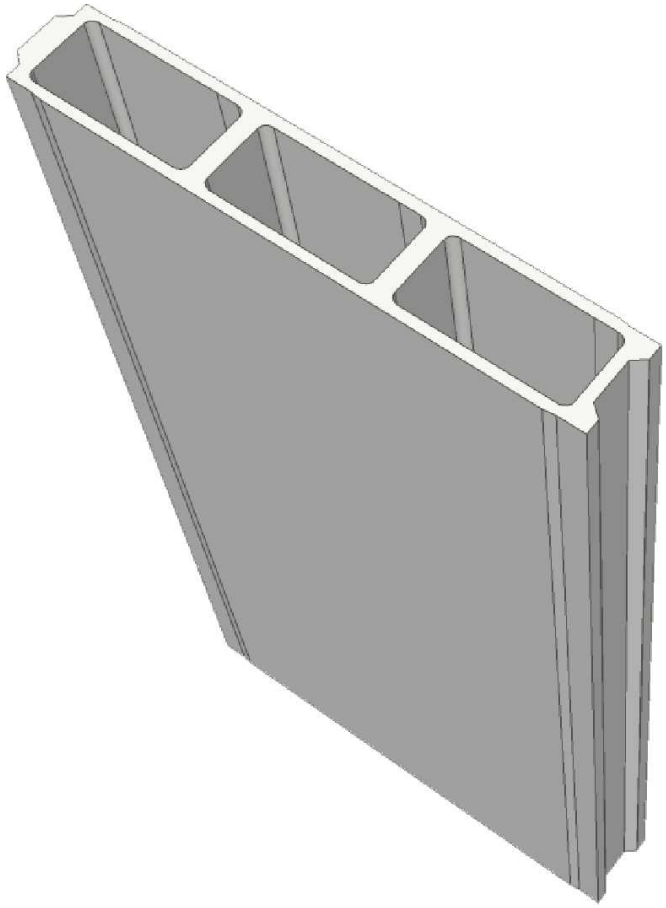
Product Variants

- SW_{100} – Full Panel
  - UK Design Patent 4034856
  - 100mm x 600mm (up to 3.6m)
  - Fire 120 minutes
  - Acoustics R_W 31
  - U-value 0.33 $W/m^2.K$
  - Cemented tongue/groove joints
  - Joints flushed ready-to-paint
  - Infill options
    - services, insulation, reinforcement



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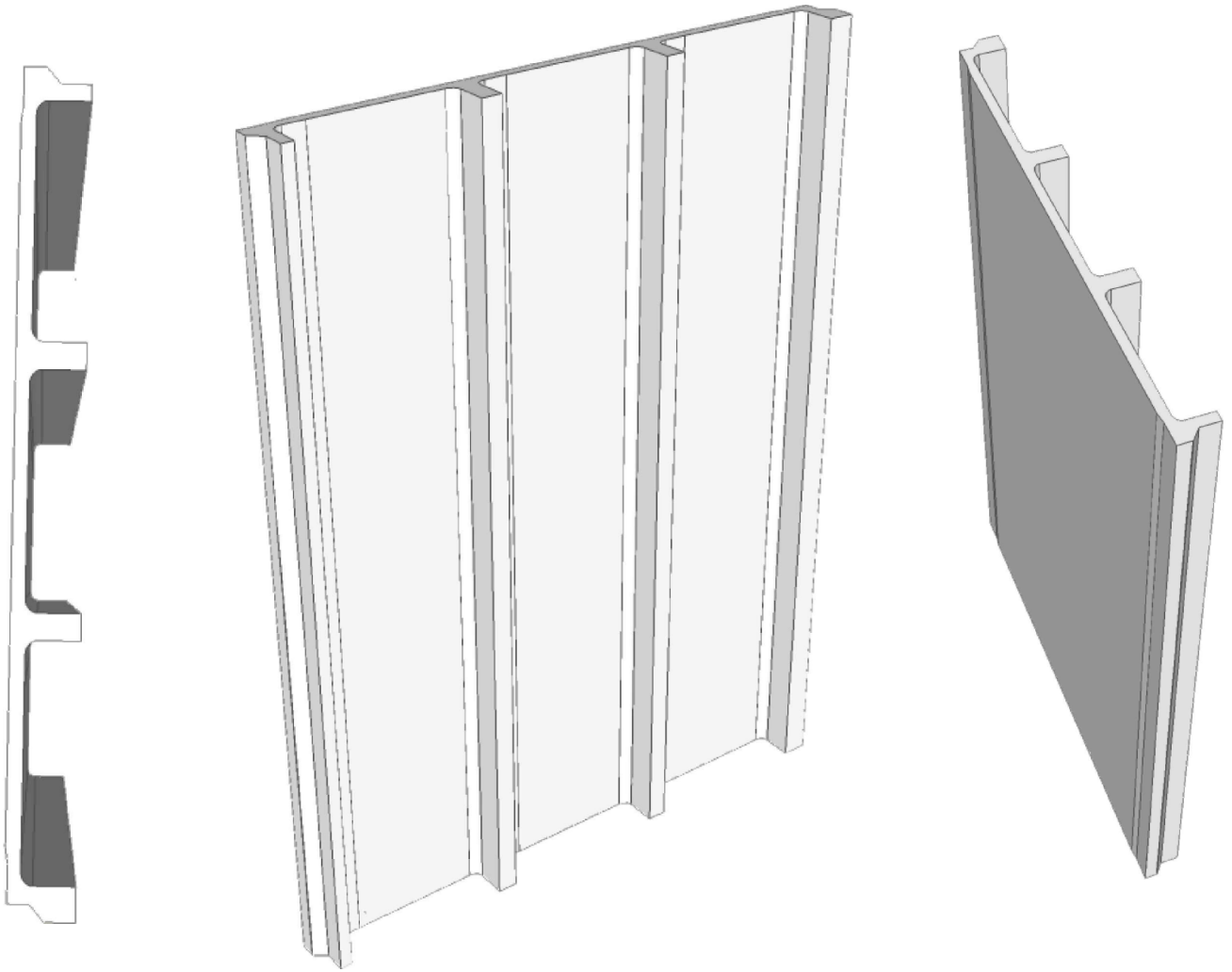
SW_{50} – Split Panel



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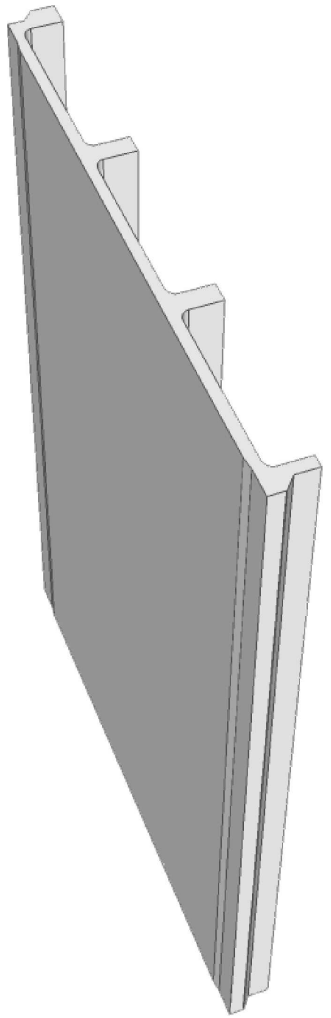
Product Variants

- SW_{50} – Split Panel
  - UK Design Patent 4034857
  - 50mm (depth) x 600mm (up to 3.6m)
  - Internal & external wall cladding
  - SIP cladding
  - Insulation options



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Product Applications

- SW_{100F} – Floor Plank (in development)
  - Standard panel (1.5m span)
  - Reinforced cavities
  - Pre-installed services
  - Solution for mezzanine floors

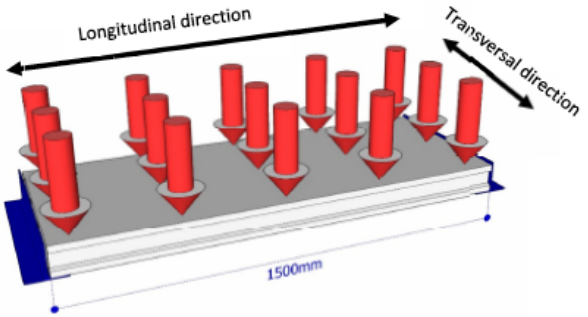

Figure 2 Flexural span of the floor panel and uniform loading configuration.

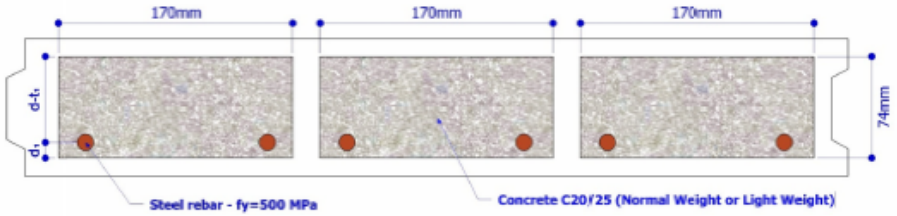

Figure 3 Cross Section of the composite element; cavities are infilled with reinforced concrete.

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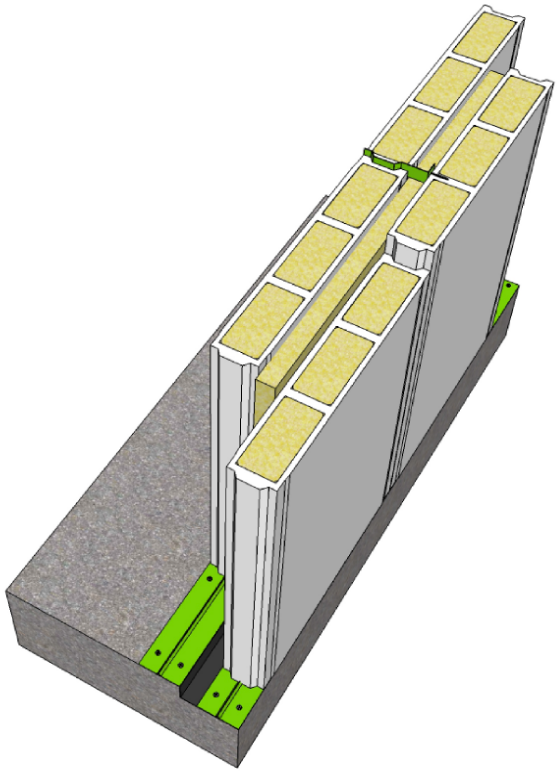
Product Applications

- 2 x SW_{100} – Party Wall (250mm)
  - 2 x SW_{100} with 50mm gap
  - Fire > 180 minutes
  - Acoustics - 52 dB
  - U-value - 0.15 $W/m^2.K$*



* Panel cavities and gap filled with PUR or equiv. insulation

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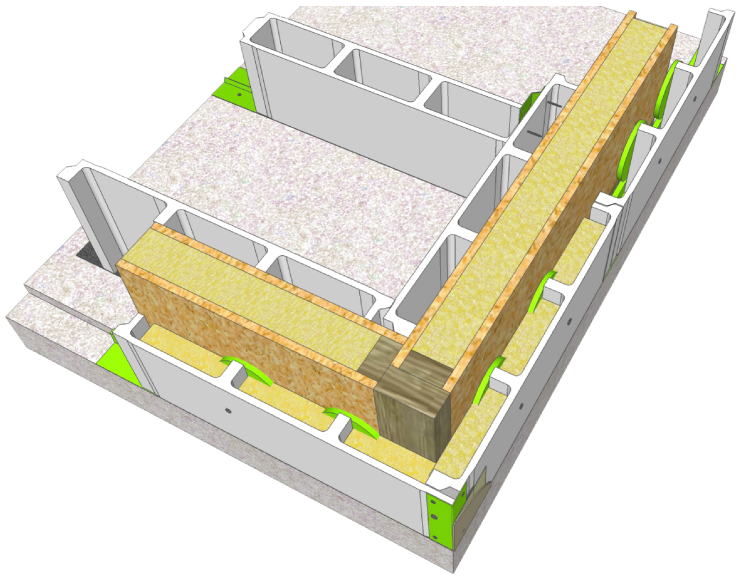
Product Applications

- SW_{50} – SIP Cladding
  - Factory-based cladding
  - Protects SIP from fire and water
  - Services in cavities
  - Internal and external applications
  - Enhances SIP performance



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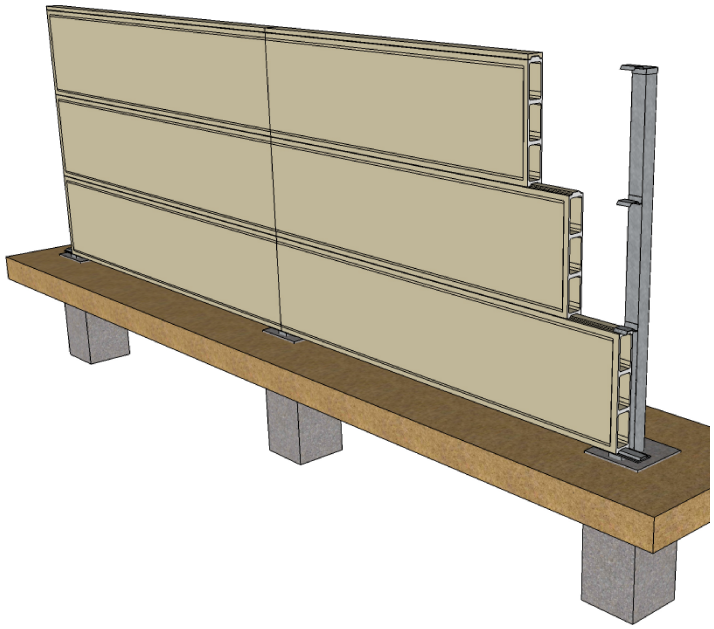
Product Applications

- SW_{100W} – Boundary Wall

  - Modular – 60/120/180cm height
  - Custom post design
  - Bespoke post foundation
  - No strip footings required
  - Water resistant composition
  - Weather-protected texture finish



  - **BBC Gardener's World 2014 – Silver Medal**!

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Environmental Benefits

- Sym-Wall® has a low carbon footprint (embodied energy) due to:
  - *Use of synthetic waste gypsum materiel (FGD)*
  - *Low energy production process, no emission, no waste*
  - *Strategic location of production plants close to market*
  - *Dry, low energy, no-waste installation process*
  - *Fully recyclable at end of useful life*
  - *Avoidance of brick, cement and concrete (high embodied energy)*

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Applications

- ***Internal Partition – SW_{100}***
  - Single skin wall (100 mm wall thickness)
  - Wall joints flushed ready for painting
- ***Internal Party Wall – 2 x SW_{100}***
  - Two skin construction with 50 mm gap (250 mm overall wall thickness)
  - Wall joints flushed ready for painting
- ***Cladding – SW_{100} and SW_{50}***
  - Walls used for external cladding of masonry, steel, timber or SIP constructions
  - Custom internal cladding solution secured to internal wall (solid brick housing – EWI)
  - External wall flushed, textured and painted as required (25 year certified)
- ***Flood-Resistant Housing – SW_{100W}***
  - Water-resistant alternative to conventional stud walling
  - Walls can be dried out without damage
  - Reduced insurance costs
- ***External Boundary and Retainer Walls – SW_{100}***
  - Cost effective perimeter, privacy, feature and retainer walls
  - Modular construction, no concrete footings required

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Market Segments

- ***New Build – Conventional and Modular***
  - *Non load bearing internal and external partition and party walls*
  - *External fabric walling for new modular house solution – Viva-City™*
- ***Insulation Upgrade***
  - *Internal and external cladding of residential and commercial*
- ***Refurbishment***
  - *Conversions for residential, offices, hotels, hospitals, schools, shops, factory premises, rail stations, airport terminals*
- ***Feature and Boundary Walls***
  - *Perimeter, security, privacy and sound barrier walls for residential and commercial*

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Proprietary Installation Process

- Sym-Wall® is designed to be installed simply and quickly by a semi-skilled, trained workforce under specialist supervision
- The installation process avoids the need for skilled tradesmen and associated "wet materiels" reducing cost and avoiding on-site waste
- For a high rise application time and motion studies have shown that a team of 7 supervised technicians can complete the installation of 200 sq.m. of internal partition walling in one 8-hour shift
- Vacuum lifting and manipulation technology is currently under development to further refine the installation time, cost and efficiency

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Summary of Commercial Benefits

- High performance
- Reduced construction time
- Reduced site labour
- Avoidance of wet materials
- No on-site waste
- Semi-skilled installers
- Reduced material holding
- Reduced carbon

= Reduced Cost!

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