THERMOSASH

PW400 Unitised

HIGH PERFORMANCE CURTAINWALL

Thermosash
BUILDING ENVELOPE SOLUTIONS™

Thermosash Commercial Ltd

158 Central Park Drive, Henderson
Auckland 0610, New Zealand

www.thermosash.co.nz

Our Unitised Facades offer the benefits of **local off-site fabrication,** modern construction techniques, and near limitless design possibilities...

bringing your boldest architectural visions to life whilst delivering practical benefits such as speed of installation, reduced risk, just-in-time site delivery, and single point warranty.

Shape the future of urban design and aesthetics with a high performance Thermosash Unitised Facade solution. We have five decades of building envelope experience to bring to your table.

Our Aluminium is **green** to the core.

Thermosash is partnered with a NZ-owned extruder providing the lowest embodied carbon aluminium readily available in New Zealand*. The combination of high recycled content and low carbon virgin material forms the high quality extrusion that Thermosash uses.

*Achieving Toitū Carbonreduce certification which far out performs the global average. (Independent audits to stringent European standard PAS 2050 are regularly undertaken, please contact us for the most up to date carbonreduce CO2e/kg of aluminium figures).

Thermosash recycles 100% of all metal waste products produced during manufacturing operations.

We exclusively use local powder coaters who have stringent chemical handling processes and reuse or responsibly dispose of all waste powder.

Middlemore Hospital
AUCKLAND

Karori Library
WELLINGTON

191 Queen St
AUCKLAND

UNITISED CURTAINWALL
PW400

The Thermosash PW400 is a four sided mechanically glazed engaged curtainwall, the horizontal transom elements and vertical mullion elements are expressed. The PW Series Suites have been extensively used and proven in New Zealand and our export markets since 1985.

The weathering design of these suites follows recognised international curtainwall design. All internal cavities of the system are designed to be pressure equalised (i.e. no pressure differential between the outside face and any internal cavity).

PRODUCT SUITE OPTIONS

UNITISED HIGH PERFORMANCE - NON THERMALLY BROKEN

PW400
Mullion sizes: 75mm / 100mm / 150mm / 200mm

Thermosash has the ability, where necessary, to structurally supplement the sections when the suite is exposed to high floor to floor spans or high wind zones, thus potentially reducing the need for additional primary or secondary structure to be provided by the Main Contractor.

UNITISED HIGH PERFORMANCE - THERMALLY BROKEN

PW400-TB160
Mullion size: 160mm

The thermally broken suites provide improved U Value performance by reducing transmittance of heat load and heat loss, and exceed industry codes for minimal air leakage. The suites also have integrated on-vision spandrel insulation.

PW400TB-S High Performance Slider
Thermally broken aluminium frames and integrated IGU glazing designed for commercial and multi-storey residential use. Bi-parting, stacker, slider functionality with frame depth 54mm and glass thickness up to 39mm IGUs. Can accommodate panel loading up to 550kg.

Fully integrates with PW400-TB160 suite.

For more information please view:
https://www.thermosash.co.nz/our-products/commercial-windows-doors/thermally-broken-pw400tb-s-high-performance-slider/

PRODUCT SPECIFICATION

MASTERSPEC FOR PW400 & PW400-TB160

We recommend using Masterspec 4211TS Commercial Windows when specifying these curtainwall suites.

CAD DOWNLOADS

PW400 CAD downloads are available from our website:

https://www.thermosash.co.nz/downloads-resources/cad-downloads/curtainwall-downloads/unitised-high-performance/pw400-downloads/

PW400-TB160 CAD downloads are available from our website:

https://www.thermosash.co.nz/downloads-resources/cad-downloads/curtainwall-downloads/unitised-thermal-high-performance/pw400-tb-160mm-unitised-thermal-break-downloads/

PRODUCT PERFORMANCE

KEY DESIGN FEATURES

- unitised panels are factory prefabricated and glazed.
- specifically engineered to accommodate the environmental conditions and design constraints of the project:
  - accommodates building movements - both vertical and horizontal (seismic).
  - accommodates differential rates of thermal expansion and contraction.
  - connection details to accommodate construction tolerances.
- structural member strengths comply with Code or project specification.
- glass design and its integration with the glazing system to ensure glass warranties are complied with.
- rainscreen pressure equalisation - all internal cavities are designed to have no pressure differential between the outside face and the inside face and any internal cavity. This allows any water that penetrates the rainscreen to drain and ventilate
- non-vision rainscreen system areas - the rainscreen acts as a primary water-stop, the second rear airseal and cavity acts as a backup to collect and drain away water that manages to penetrate the primary barrier, with an integral structural backpan.
- sizing of modules is generally only limited by the project design requirements, economic considerations, transport and site crane installation limitations.

PERFORMANCE TESTING

Thermosash owns and operates the largest facade testing facility in New Zealand where we test our systems and custom designed suites to ensure compliance with the below codes or project specific requirements.

Independently laboratory tested to IANZ (International Accreditation New Zealand)

B1/VM1	AS/NZS1170 Structural Design Actions
B2/AS1	Durability [based on in-service history]
F2	NZS4223 Glazing in Buildings
E2	NZS/AS4284:2008 Water / Air Pressure/ Air Leakage - exceeds minimum requirements

THERMAL PERFORMANCE

The final performance of the curtainwall suite is subject to many variables, from size of individual panels, glass performance, introduction of transoms and integrated solar shading (where bracketing may cause a cold link passage) and spandrel depth (insulation).

Thermally Broken Suites: Polyamide
The polyamide thermal break is integrated into the aluminium framing to minimise thermal bridging, which is the transfer of heat through conductive materials. Polyamide is a low-conductivity material that significantly reduces heat flow, improving the facade's thermal performance and reducing energy consumption.

Our team of designers and engineers are able to review your project and advise around the best suite solution for your project's thermal performance requirements. Please contact us to discuss further.

GLASS PERFORMANCE

It is important to note that the aluminium section alone does not provide the thermal performance often expected. Glass specification is a significant contributor to the overall mechanical performance requirement of a building. The larger the glass pane the better performing the panel will be on average. Thermosash has access to suppliers of low carbon high performance glazing and can deliver an integrate solution.

BUILDING CODE PERFORMANCE

Thermosash engineers to the specific design and performance requirements of each individual project in compliance with the relevant codes - view the table, Building Code - Demonstration of Compliance on page 8 of this brochure.

PRODUCT CAPABILITIES

MAXIMUM SPANNING ABILITY

The spanning ability will vary depending on the structural system and environmental loads (e.g. wind). Thermosash specifically engineers the best suite options to meet project requirements. Our suites are recognized as having the largest spanning systems on the market due to our specific engineering capability and the customised nature of the work we complete.

INTEGRATED ELEMENTS

- A large variety of materials can be integrated into a unitised panel, including:
  - different glass types
  - metals
  - terracotta tiles
  - large format porcelain
  - glass reinforced concrete (GRC)
- brackets to receive externally mounted fins, louvres, Venetians, custom feature elements, or building signage
- The PW400 can accommodate opening sashes suitable for high-rise installations.

UNITISED SYSTEMS CAPABILITIES INCLUDE

- Curtainwall systems
- Secondary Acoustic Glazing
- Thermal Systems
- Twin Skin Systems
- Seismic Systems
- Acoustic Systems
- Shopfront

ENGINEERING & FABRICATION

CUSTOM ENGINEERED SOLUTIONS

Thermosash design and detail the facade solution to meet the project demand for seismic risk, wind loads, climate zones, corrosion zones and building importance levels as well as aesthetics, unique site constraints and budgetary requirements. We have extensive experience in integrating our systems and products to deliver a total facade solution.

PRESSURE EQUALISED DESIGN

The weathering design of these curtainwall suites follows recognised international curtainwall design principles - rainscreen pressure equalisation and system drainage - which requires primary and secondary weathering.

All internal cavities of the system are designed to be pressure equalised (i.e. no pressure differential between the outside face and any internal cavity). This feature allows the water which penetrates the rainscreen to drain and maintain ventilation. The rear air seal is critical to the system's weathering performance as air infiltration acts as the medium which transports water through to the building's interior, i.e. it is the prime cause of any leakage.

Non-vision rainscreen areas act as a primary water-stop, the second airseal and cavity acts as a backup to collect and drain away any water that manages to penetrate the primary rainscreen barrier, with an integral structural backpan.

UNITISED PREFABRICATION

Our systems are precision prefabricated and glazed as unitised panels and elements at our manufacturing facilities in Auckland, Wellington and Christchurch. Products are stored and transported for just-in-time site delivery. - reducing on-site clutter.

INTENDED USE

CLASSIFICATION

- Clause A1 Building Use Classification:
  - Housing, Communal residential, Communal non-residential, Commercial, Industrial and Ancillary
- Clause A3 Building Importance Levels from 1-5

BUILDING TYPE

- High-rise
- Mid-rise
- Low-rise
- Specific design

BUILDING LOCATION

Thermosash provides custom design solutions taking into consideration wind zones, climate zones, corrosion zones, seismic risk areas and may be designed for specific project requirements complying with AS/NZS 4680.

CONDITIONS OF USE

The PW400 suite must be installed by an approved Thermosash installer. The architect, engineer or specifier must confirm all of the project requirements prior to fabrication, including but not limited to climate conditions, glass selections, structural differential movement reports, performance requirements for glass and acoustics, surface finishes and hardware.

MATERIAL COMPOSITION

Each project will have specific engineered and designed component solutions, fabricated in New Zealand and provided as a complete custom system, which incorporates common materials such as:

Aluminium, Steel, Glass, Structural Silicone, Gaskets, Neoprene Rubber, Nylon, Molybdenum Disulfide, and PVB Polyvinal Butyral.

MATERIAL GRADE

Alloy designation to comply with AS/NZS 1866. Extruded for anodising or powder coating. Aluminium extrusions from 6060 grade and with a Temper T6 alloy.

FINISH

Polyester powdercoat - both standard and special colours available. (Polyester powder organic coating in accordance with WGANZ PQAS and AS 3715, and AAMA 2604).
Anodised - all anodised colours available - commercial grade 20 Micron finish recommended
PVF2 Fluorocarbon finishes - available on request

FIXINGS

Fixings and fastenings exposed to the weather are type 316 or 304 stainless steel typically but other suitable fixings back to structure may be designed for specific project requirements complying with AS/NZS 4680.

Fixing gauge and length in accordance with Thermosash PS1.

MAINTENANCE REQUIREMENTS

A maintenance manual is provided on completion of a project for all the elements integrated within a project. Compliance to a maintenance schedule is essential to maintaining the quality of the installed product over time. Using Thermosash-approved facade maintenance contractor/personnel ensures the highest standards are met.

It is recommended by almost all material suppliers that building washing should occur every 3-6 months to prevent staining to glass and prevent environmental pollutants from corroding metals and to maintain the material warranties.

WARRANTY

The standard warranty is 10 years from the date of practical completion for these products. This covers workmanship and weather tightness, providing the subcontract includes fabrication, installation and glazing of all components.

All warranties are subject to service and maintenance requirements.

SUSTAINABILITY

SUSTAINABLE MANUFACTURING

Thermosash manufactures all system components in New Zealand, and primarily source materials where available from the New Zealand market. Our precision machinery ensures optimised material usage with 100% of all metal waste products recycled in the factory, saving on-site waste. We recycle 100% uncontaminated soft plastics, timber, cardboard, paper and 99.5% commercial float glass and IGUs.

LOW CARBON ALUMINIUM EXTRUSIONS

Thermosash DecarbAL™ delivers a super low sustainable embodied carbon footprint per kilogram of aluminium. At the heart of Thermosash's sustainability journey is a partnership with a local New Zealand owned remelt facility producing extrusions with 80% recycled content and low carbon virgin material. Our aluminium supplier is audited annually, for up to date carbon figures please contact us.

LOW CARBON GLASS

Thermosash's commitment to sustainability also extends to our glass selection. With access to worldwide low-carbon glass suppliers, we ensure that our projects benefit from environmentally friendly and high performance glazing options, further reducing the carbon footprint

FACADE OPTIMISATION STRATEGIES

To achieve optimised high performance outcomes we offer our clients the option of a Project Sustainability Analysis that covers different aspects of the full sustainability cycle. When specifying our facade systems, clients can engage us to implement one or several of our Facade Optimisation Strategies to achieve their project sustainability goals. To gain the most from our strategies, talk to us early on in the design phase of your project.

Our Thermosash Sustainability Team can assess and provide analysis reports on embodied and operational carbon engineering optimisation and costs, energy and comfort optimisation and costs, as well as assistance with Green Star credits - these strategies help to guide material selection, shape a more efficient design and provide clarity on ROI payback periods.

REDUCTION OF OPERATIONAL EMISSIONS

Through a full measurement and target reductions audit undertaken by Toitū Envirocare, Thermosash Commercial Ltd achieved Carbonreduce Certification. This provides a baseline for subsequent emission reduction targets going forwards. Please contact us for up to date certification figures.

BENEFITS

Thermosash is a New Zealand based business and has been engineering and manufacturing specific design facade solutions across the country since 1973. We deliver solutions using our trusted and proven systems, offering increased value in terms of;

- +50 years of experience, expertise and long-standing trust demonstrated by the installation of hundreds of successful facade solutions across New Zealand, with proven complex project delivery.
- Totally integrated service with ECI /ECE - engineering, producer statement generation, full shop drawings, manufacture and installation.
- Custom engineering to accommodate seismic loads and inter-storey differential movement, as well as wind loads and structural and site requirements tailored to high performance outcomes.
- Precision prefabrication with cutting edge technology ensuring durable quality systems and longevity of product lifespan.
- Responsible procurement and waste management
- Risk mitigation through one provider construction methodology and one warranty
- Site delivery logistics management and expert installation with well-considered strategies and safety methodologies
- Faster install time-frames due to the modular nature of our unitised facade systems.
- Designed to last 50+ years, and if required, can be removed and reinstalled on other projects prior to end of life. As demonstrated with earthquake damaged BNZ Harbour Quays, Wellington - where the facade was removed and reused on several projects including the Wellington Regional Children's Hospital.

PREFABRICATED UNITISED SYSTEM ADVANTAGES

- Off-site fabrication and glazing reduces on-site waste and clutter
- Unitised panels can seamlessly incorporate a variety of cladding materials and integrated elements
- Engineered to accommodate project specific environmental conditions and design constraints for high performance outcomes
- Quality assurance and control is implemented across the fabrication process and during on-site installation
- Site installation is quicker due to the modular construction - enclosing buildings rapidly and reducing on-site programme time
- On-site delays are reduced during inclement weather - fabrication can continue even if site falls behind and Unitised panels can be placed on completed floors in loading crates ready for installation on a just-in-time basis.
- Scaffold and crane requirements are dramatically reduced

COST SAVINGS

- Reduced number of junctions with other trades if Thermosash engineers, manufactures and installs the building envelope elements such as curtainwall, glazed and non-vision unitised panels, rainscreen, skylights, mechanical air louvres, solar shading and integrated elements, architectural metal folding, canopies, balustrades, flashings etc.
- Reduced number of council inspections during construction and possible delays, saving on compliance costs
- Specifically designed and engineered facade solutions that offer high performance and durability which contribute to cost savings on operational energy and maintenance over the lifespan of the building, and maximises ROI

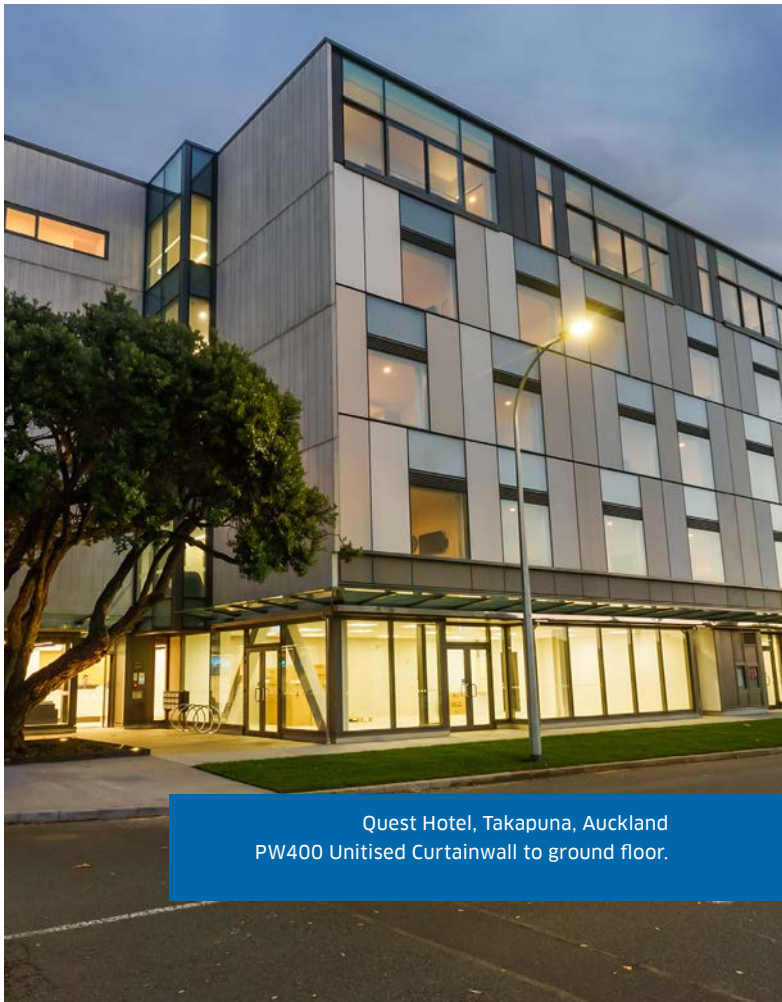
ADVANTAGES OF EARLY INVOLVEMENT ECI

The facade must protect the structure and occupants, and should provide a comfortable and healthy interior environment over the lifetime of the building. The facade is a critical-path trade - we offer and advocate for early contractor involvement so that we can work alongside you on your project to reduce risk and deliver value driven long-term outcomes.

Early involvement gives us the opportunity to improve your project value and outcome:

- Let us manage the facade risk and identify buildability and site risks early.
- Utilise our experience and knowledge of our systems and products to assist your decision making including with materials, testing, performance and sustainability targets.
- Save on variation costs with our early design inputs and technical assistance.
- Gain price and scope certainty.
- Streamline the consent process with our in-house high risk Producer Statement authors who can provide a higher level of detail to Council.
- Benefit from our forward planning and material procurement and avoid unnecessary delays.
- Reduce on-site risk through our proactive management of construction risk for critical-path trade.

NOTE: THIS BROCHURE CONTAINS A SUMMARISED VERSION OF BUILDING PRODUCT INFORMATION REQUIREMENTS (BPIR) CLASS 2 DISCLOSURE INFORMATION - OUR COMPREHENSIVE DOCUMENTS CAN BE DOWNLOADED FROM:
HTTPS://WWW.THERMOSASH.CO.NZ/DOWNLOADS-RESOURCES/BPIR-DOCUMENTS/



Quest Hotel, Takapuna, Auckland
PW400 Unitised Curtainwall to ground floor.

Queenstown Gondola - bottom terminal

QUEENSTOWN

Waste Management NZ

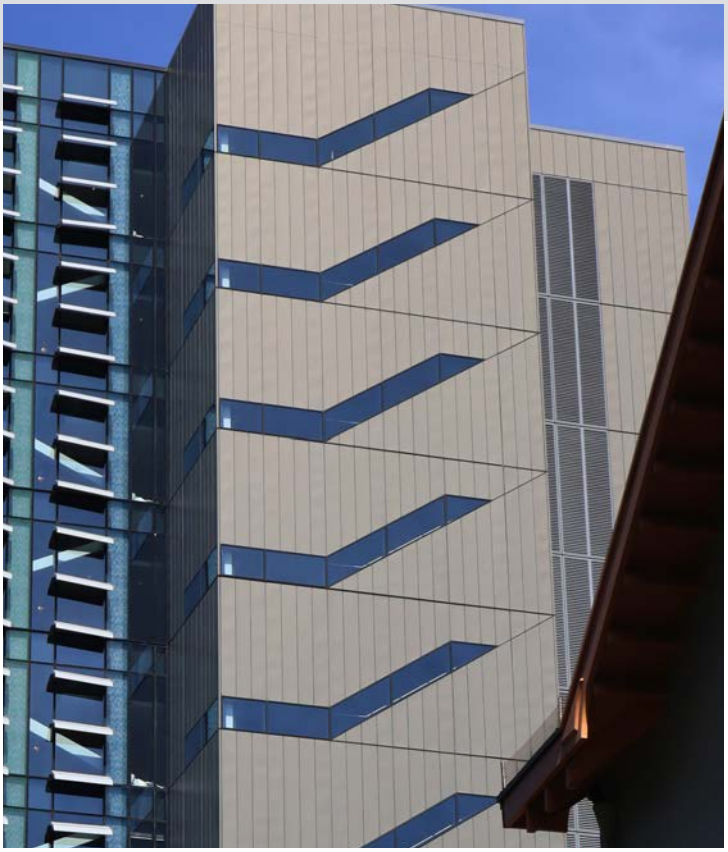
AUCKLAND

BUILDING CODE - DEMONSTRATION OF COMPLIANCE

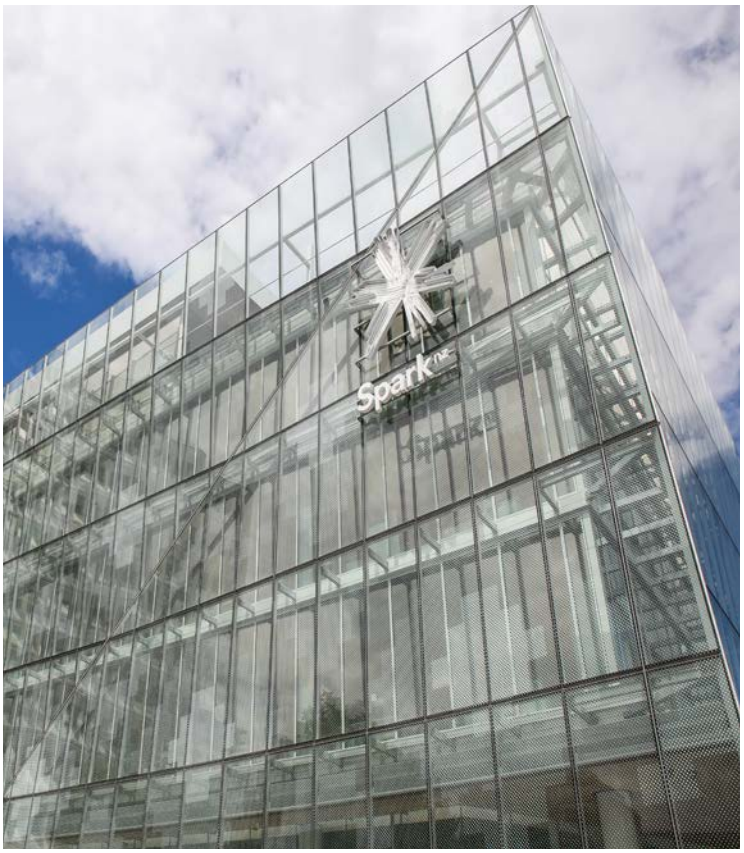
BUILDING CODE	DEMONSTRATION OF COMPLIANCE
B1 **STRUCTURE**	**COMPLIANCE BY B1/VM1** Compliance with B1 is shown by way of engineering calculations and/or testing, and reports are attached to the compliance pathway submission.
B2 **DURABILITY**	**ACCEPTABLE SOLUTIONS B2/AS1** There are no Acceptable Solutions available for aluminium and steel, and protection is provided through surface treatment in accordance with: • AS/NZS 2312:2014 - Guide to the protection of structural steel against atmospheric corrosion by the use of protective coatings. • AAMA 2605-05 - Voluntary specification, performance requirements and test procedures for superior performing organic coatings on aluminium extrusions and panels. • AS 37155:2002 - Metal finishing thermoset powder coatings for architectural applications of aluminium and aluminium alloys. • AS 1231:2000 - Aluminium and aluminium alloys - anodic oxidation coatings. • WANZ - Specification for powder coatings on architectural aluminium products. • SNZ TS 3404:2018 - Durability requirements for steel structures and components **COMPLIANCE BY B2/VM1** All elements of the Thermosash product/system are specified by Thermosash to (with only normal maintenance) satisfy the performance requirements of the Building Code for 5 years (Surface Finish), 15 years (System), 50 years (Fixings/ Connections) as appropriate. Generally, all elements are designed from aluminium. Where engineering requirements demand stronger materials stainless steel (304 or 316 as appropriate), or steel (coated to SNZ TS 3404:2018) will be used.
C3 **FIRE**	**AFFECTING AREAS BEYOND THE SOURCE** We are not fire engineers and do not engage in the fire design of buildings, however, our products can be tailored to support compliance with Clause C3 if required. We recommend collaborating with a fire engineer to ensure proper customization and adherence to fire safety requirements.
E2 **EXTERNAL MOISTURE**	**COMPLIANCE BY E2 ALTERNATIVE SOLUTIONS** Compliance of E2 Alternative solution testing to AS/NZS4284 and good practice detailing as shown by way of testing, and test results are attached to every compliance pathway submission. Any complex/high-risk details that arise will be checked specifically for weather tightness by our in-house Producer Statement Author following best practice design principles, making use of pressure-equalised drained cavities and specialist expertise and experience. If required by the Client's Peer Reviewer, Thermosash can complete QA/QC site water testing in accordance with the following: • AAMA 501.2 test - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems (for fixed elements).
F2 **HAZARDOUS MATERIALS**	**COMPLIANCE BY F2/AS1 NZS4223.3** There are no hazardous materials except glass within our systems. Compliance with F2 Hazardous Materials for glass is shown by compliance with NZS4223.3 or specific design (occasionally terracotta tiles or porcelain stone may be integrated).
F4 **SAFETY FROM FALLING**	**COMPLIANCE BY NZ/AS 1170.1** Thermosash follows the safety in design intent on the architectural drawings and designs the doors/windows/ curtainwall for C3 barrier loads where protecting a fall greater than 1 m (NZS/AS 1170.1 Table 3.3). Thermosash's responsibility is limited to the door/window/curtainwall.and balustrading - where integrated into our package.
G4 **VENTILATIONS**	While we do not assume responsibility for fenestration and ventilation design within buildings, we offer fenestration advice and have the capacity to customize our products to aid in achieving compliance with Clause G4 standards if applicable.
G7 **NATURAL LIGHT**	While we do not assume responsibility for fenestration and lighting design within buildings, Thermosash will provide an engineered solution along with a comprehensive compliance pathway for approval if compliance to this clause is applicable.
H1 **ENERGY EFFICIENCY**	In the event that our facade solution is required to comply with Building Code H1 Energy Efficiency, compliance will be shown by way of Engineer's report, Acceptable Solution H1/AS2 or Verification Method H1/VM2 where applicable, or an alternative solution should this be necessary, and include test results attached to a compliance pathway submission, including a PS3 Construction Producer Statement for our product solution.

Holiday Inn Remarkables Park, Queenstown - PW400 Unitised Curtainwall Suite to the ground floor

Quest Hotel, Takapuna - PW400 Unitised Curtainwall Suite to the ground floor



UOA Engineering B405 - PW400 fixed double glazed punch windows



Spark HQ, Christchurch - internal PW400 skin with an external PW1000 skin

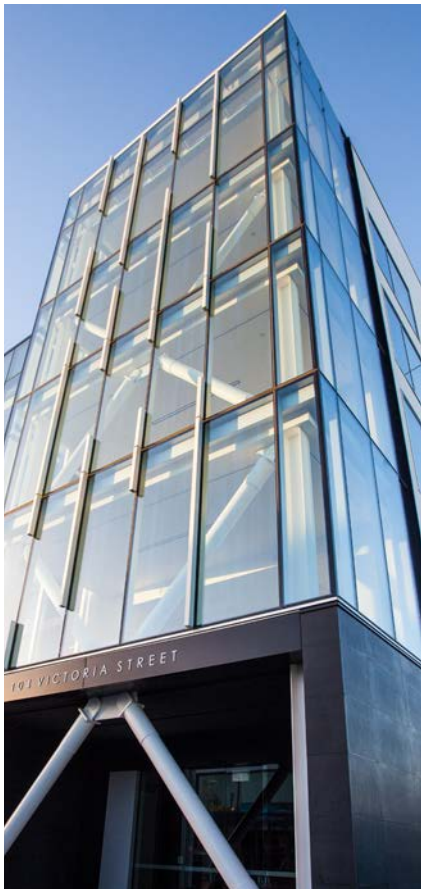
UOA Parkwest 507 - PW400 Suite to wind lobbies

UOA Thomas Building - PW400 Unitised double glazed curtainwall with external skin structural glass louvres

The Crossing, Quest Hotel, Auckland - PW400 Unitised Curtainwall

Waitakere Civic Centre, Auckland - PW400 Unitised Curtainwall installed as secondary glazing to Civic building and primary curtainwall to Admin block.

Warren and Mahoney Offices, Christchurch - PW400 Unitised Curtainwall with channel glazing & opening sashes to ground floor



104 Victoria Str, Christchurch - PW400 Unitised Curtainwall with integrated vertical fins

Showplace, Christchurch - PW400 Unitised Curtainwall with integrated solar shading

THERMOSASH

CURTAINWALL PRODUCT RANGE

THERMOSASH SYSTEM	UNITISED	COMMERCIAL	HIGHRISE	LOWRISE	THERMAL BROKEN	THERMAL EFFICIENT	SEISMIC OPTIONAL	ACOUSTIC OPTIONAL	TWINSKIN OPTIONAL	SECONDARY GLAZING / JOCKEY SASH OPTIONAL
UNITISED										
PW1000	•	•	•	•		•	•	•	•	•
PW1000 - TB200	•	•	•	•	•		•	•	•	•
PW1000 - TB160	•	•	•	•	•		•	•	•	•
PW800	•	•	•	•			•	•	•	•
PW600	•	•	•	•			•	•	•	•
PW400	•	•	•	•			•	•	•	•
PW400 - TB160	•	•	•	•	•		•	•	•	•
PW100	•	•		•			•	•	•	•
PW80	•	•		•			•	•	•	•
PW60	•	•		•			•	•	•	•
PW40	•	•		•			•	•	•	•
DELTA	•	•	•	•			•	•		•
DELTA - TB50	•	•	•	•	•		•	•		•
STICKWALL										
CW800		•		•		•	•	•	•	•
CW600		•		•		•	•	•	•	•
CW400		•		•		•	•	•	•	•
CW40		•		•		•	•	•	•	•

OUR BRANCHES

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Thermosash are members of:

NZGBC
TE KAUNIHERA HANGANGA TAUTAIAO

Brochure version 04 | January 2026

Thermosash
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