

 JURALCO

JURALCO WINTERGLAZE[®] SECONDARY GLAZING SYSTEM

ISSUE 1/17

Juralco Winterglaze® Secondary Glazing System

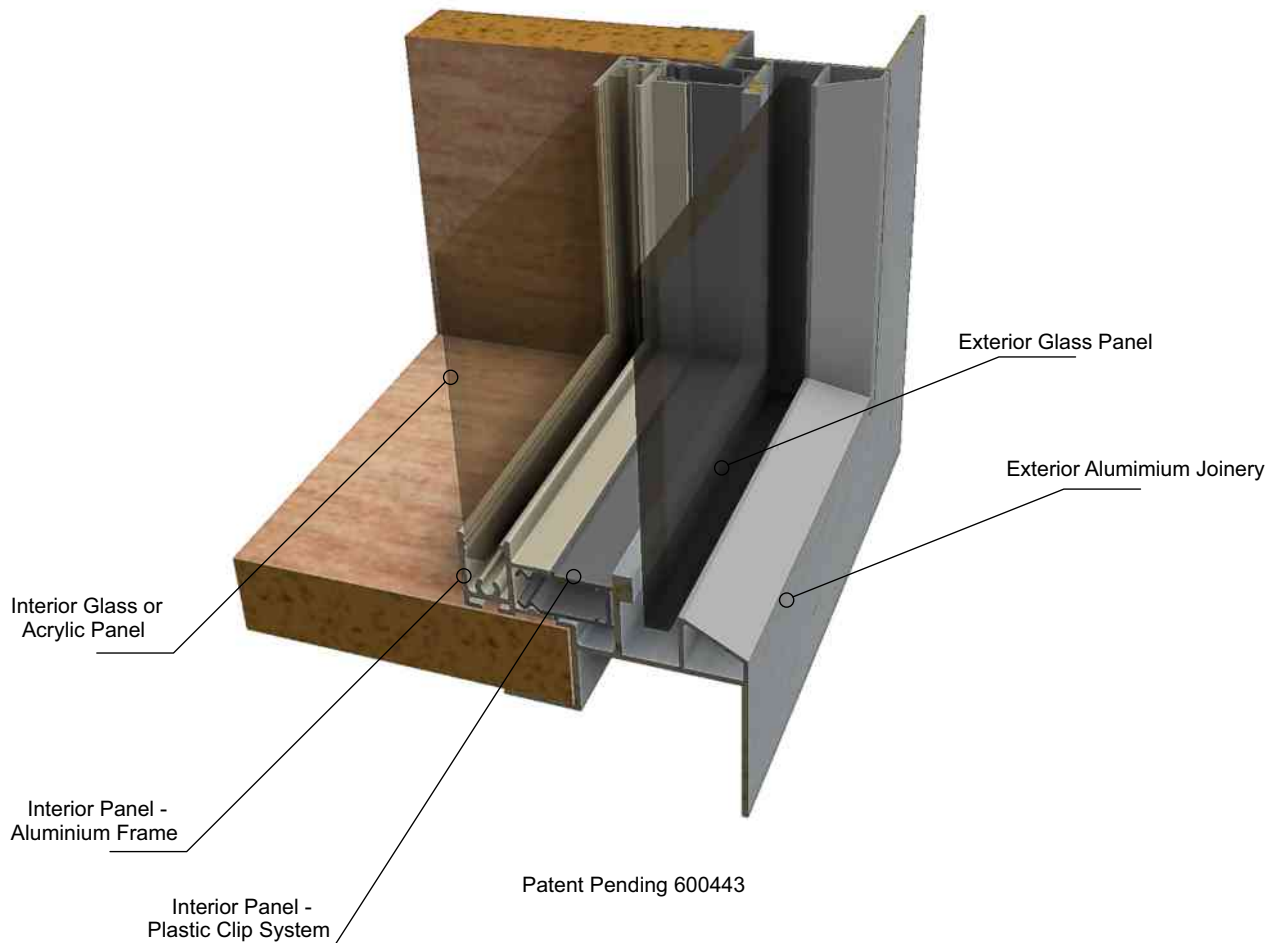
Juralco Aluminium Building Products Ltd designs and distributes specialist aluminium joinery systems through a national network of franchised fabricators and agents.

For more than 25 years we have been at the forefront of specialist aluminium door and window products suitable for New Zealand joinery and building methods. Our comprehensive product range includes security and insect screens, balustrades and gates, shutters and awnings, shower screens, wardrobe doors and organisers and internal doors.

The Juralco Secondary Glazing System combines a contemporary Aluminium frame encasing a glass or acrylic panel, with a patent pending plastic clipping system. The system is an extremely efficient and easily installed interior double glazing system. The frame is available in a range of configurations and powder-coat colours to meet most modern architectural requirements.

This Guide is intended for use by Architects and Specifiers

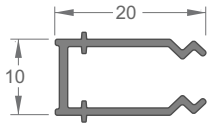
Secondary Glazing showing Key features.
This Interior Secondary Glazing System is suitable for Aluminium or Wooden Joinery



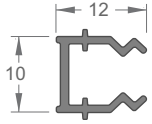
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Juralco Winterglaze® Secondary Glazing System - Extrusions, Components

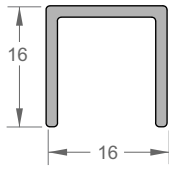
Extrusions



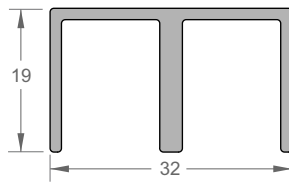
20mm CLIPBEAD
Part No CB/04
(Plastic Extrusion)



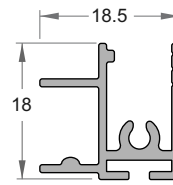
12mm CLIPBEAD
Part No CB/02
(Plastic Extrusion)



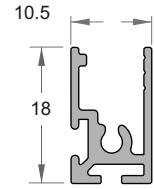
TOP SINGLE TRACK
Part No J7470
(Aluminium Extrusion)



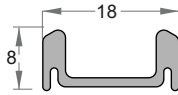
TOP DOUBLE TRACK -
Part No T03
(Aluminium Extrusion)



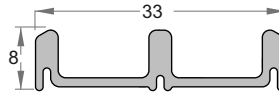
CLIP SASH
Part No S10
(Aluminium Extrusion)



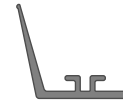
SLIDING SASH
Part No S11
(Aluminium Extrusion)



BOTTOM SINGLE TRACK
Part No T01
(Aluminium Extrusion)



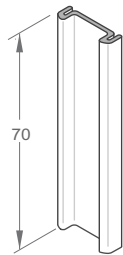
BOTTOM DOUBLE TRACK
Part No T02
(Aluminium Extrusion)



Interlock
Part No L01
(Plastic Extrusion)

Components

Slider Handle Part No SH

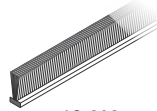


Cut from Single Track.
Use 2 x strips X02 Double sided Tape
to adhere to Glass/acrylic

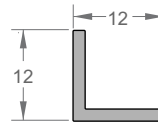
Mohair Seals



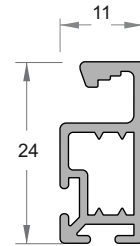
JC 230
4.5mm pile



JC 232
10mm pile

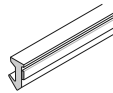


ANGLE 12 x 12
Part No JA 110
(Aluminium Extrusion)



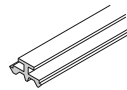
INSECT SCREEN FRAME
Part No S12
(Aluminium Extrusion)

Glazing Wedges Co extruded Sanoprene



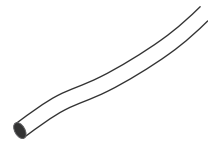
Part No JWG/W44 (for 3mm Acrylic)
Part No JW/W54 (for 4.5mm Acrylic)
Both 150mt rolls

Channel Slider Foot Part No CS01



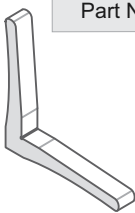
PVC

Spline JC 220/300 Black



For Insect Screen only
5mm dia x 300mt roll

Corner Stake Part No JWG/C28



For S12 Insect Screen only

3M HIPA Cleaner Part No HIPA/300



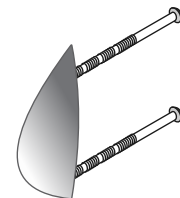
300ml Aerosol Cans

3M 94 Primer Part No P94/240



240ml cans

Frame Handle Part No FH



12mm Polypropylene Tape Part No PPT12



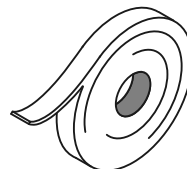
12mm wide

Double sided Foam Tape Part No JWG/CBTAPE



3M VHB tape - 8mm wide x 1.55mm

Double sided Foam Tape Part No X 04

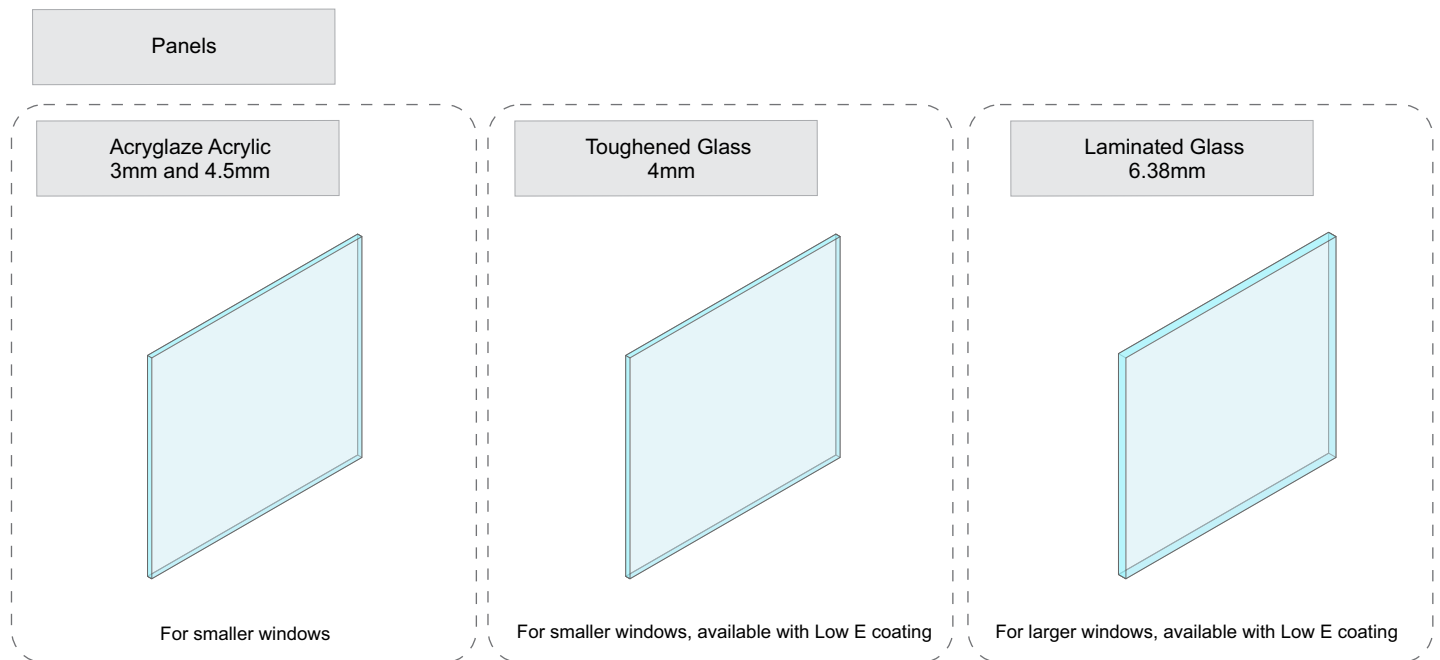


12.7mm wide x 66mt

FibreGlass Mesh

| Charcoal 18x14x0.11mm x 50mt Roll | |
|-----------------------------------|--------|
| Part No | Width |
| JPSFG/810/50 | 810mm |
| JPSFG/910/50 | 910mm |
| JPSFG/1220/50 | 1220mm |
| JPSFG/1830/50 | 1830mm |
| JPSFG/2130/50 | 2130mm |

Juralco Winterglaze® Secondary Glazing System - Panels, Thermal Performance



Thermal Performance

As with double glazing the thermal resistance of secondary glazing depends on the size of the air gap.

For best practice, a minimum 20mm gap between existing and secondary glazing is required.

In a timber window this results in an R value of approximately 0.34 m²·K/ W for the complete window, and in a metal window approximately 0.29 m²·K/ W

Of course much of the thermal resistance depends on the quality of the existing window.

Secondary glazing increases the thermal performance of a window by creating a still air gap between the secondary glazing and the existing window frame. This still air gap provides the majority of the window's thermal resistance.

A small additional amount of insulation is provided by the still air that 'sticks' to the outside of the panes and an even smaller amount comes from the thermal resistance of the glass itself.

The increase in the thermal resistance depends on the material, type and the air tightness of the existing frame as well as the type of secondary glazing used. It would be expected that typical R values for secondary glazing vary depending on the product.

Apart from the reduction in heat loss gained, the increase in surface temperature of the glass facing the room may improve the comfort, particularly of persons sitting or working near the windows due to reduced radiation losses and cold convection currents

Condensation

This research found almost all manufacturers advertise their secondary glazing products as an effective way to stop or reduce condensation problems in winter. Secondary glazing achieves this by increasing the temperature on the internal pane of glass. Due to this increase in temperature water vapour in the air is less likely to form condensation on the interior glazing surface. This is because the window surface temperature is more likely to be above the dew point of the air. One problem with secondary glazing however is that, when the secondary glazing is closed (sealed), normal room air is trapped between the double glazing space, this having the same dew point as the room air.

One of the effects of secondary glazing is to substantially reduce the temperature of the inner surface of the original single glazing, thus greatly increasing the risk of condensation in between the panes.

If the secondary glazing is permanently fixed to the window then the cavity needs breather holes to prevent condensation.

The secondary glazing should be installed under relatively dry conditions (preferably in cold weather) to prevent trapping humid air in the airspace.

Air Tightness

Another performance benefit of secondary glazing is that it can reduce the air infiltration through the existing window frames.

As older operable windows begin to deteriorate they become susceptible to air leakage.

Air leakage contributes to 10 - 17% of heat loss in a fully insulated house and 6- 9% in an uninsulated house

A New Zealand study found that the airtightness of a house could be improved by 30% by taping all the opening joints on timber windows. This 30% decrease would provide a 2 - 3% decrease in heat loss of an uninsulated building or a 3 - 5% percent decrease for an insulated building.

Sealed secondary glazing units fixed to the timber reveal, and not the sash, could potentially have a comparable effect.

Historic Retrofitting

Another use of secondary glazing is for retrofitting historic buildings. Many of these buildings have windows which must remain to preserve the aesthetic of the original building. Other homeowners may just wish to retain the aesthetic of their timber windows. This makes fitting of windows with IGUs difficult and expensive.

Historic timber is likely to be of better quality than modern replacements. Repair and draught-proofing or secondary glazing can be a viable alternative and retains the historic appearance of the house

Acknowledgement - Extract above from a thesis by Nick Smith, University of Victoria, Wellington

Juralco Winterglaze® Secondary Glazing System - Panel Types

Acryglaze Properties

ACRYGLAZE

Acryglaze (perspex, plexiglass...) (Polymethyl methacrylate or PMMA) is a transparent thermoplastic, often used as a lightweight or shatter-resistant alternative to glass. It is sometimes called acrylic glass.

PMMA is a strong and lightweight material.

It has a density of 1.17–1.20 g/cm³, which is less than half that of glass.

It also has good impact strength, higher than that of glass.

PMMA transmits up to 92% of visible light (3 mm thickness), and gives a reflection of about 4% from each of its surfaces.

It filters ultraviolet (UV) light at wavelengths below about 300 nm (similar to ordinary window glass).

The highest quality PMMA sheets are produced by cell casting,

| Properties | Unit | |
|--|-----------------------|------------------------|
| Specific Gravity | | 1.19 |
| Hardness | | HRC 9.5 |
| Water Absorption | % | 0.35 |
| Tensile Strength: | | |
| Tensile strength at yield | kg/cm ² | 709 |
| Tensile strength at break | kg/cm ² | 696 |
| Tensile Modulus | kg/cm ² | 29,532 |
| Elongation at break | % | 8 |
| Bending Strength: | | |
| Flexural Strength | kg/cm ² | 1,652 |
| Flexural Modulus | kg/cm ² | 33,264 |
| Impact Strength | kg/cm ² | 1.1 |
| Shear Strength | kg/cm ² | 610-650 |
| Transmittancy: | | |
| Full rays | % | 93.3 |
| Parallel rays | % | HA7F-0.77 |
| Specific Heat | Cal/g/°C | 0.35 |
| Heat Distortion Temperature (4.6kg/cm) | °C | 100 |
| Coefficient of Heat Conductivity | Cal/s/cm ² | 4.5 x 10 ⁻⁴ |
| Coefficient of Linear Expansion | cm/cm/°C | 6.5 x 10 ⁻⁵ |
| Ultimate Temperature of Continuous Operation | °C | 60-90 |
| Flammability | MM/min | 3.3 |
| Surface Resistivity at 28°C | Ohm | >10 ¹⁵ |
| Volume Resistivity | Ohm.cm | > 10 ¹⁵ |
| Thermoforming Ranges | °C | 110-180 |
| Dielectric Strength | Kv/Min | 20 |

GLASS - TOUGHENED

Toughened

TempaFloat is thermally toughened safety glass manufactured by Metro GlassTech.

Toughened glass is also known as tempered glass

TempaFloat is produced by cutting and processing sheets of glass which are then loaded into a furnace which has a bed of oscillating rollers. The glass is heated to a plastic state at around 650 degrees C.

Then by computer control the glass is moved into the quench area where it is rapidly cooled by a series of high pressure air nozzles. This rapid cooling or quenching induces high compression stress in the glass surface while the centre remains in tension.

Although the physical characteristics remain unchanged the additional stresses created within the glass increase its thermal and mechanical strength.

Safety

In the unlikely event of TempaFloat breaking, it fractures into small particles, significantly reducing the risk of injury. TempaFloat is a Grade A Safety Glass in accordance with NZS 4223: Part 3 and AS/NZS 2208 "Safety glazing materials in buildings".

Strength

TempaFloat has high mechanical strength and is 4 to 5 times stronger than annealed glass of the same thickness due to the stresses induced during toughening. It also has high thermal strength when compared with annealed glass and can withstand a temperature differential of 250 degrees C. It is stable in temperatures ranging from -70 degrees C to 300 degrees C.

Climate Control

Toughened glass can also be made with Low E coating to reduce heat loss from the building and thus save on energy costs..

GLASS - LAMINATED

SafeLite Laminated Safety Glass consists of two or more sheets of float glass permanently bonded together by a plastic or resin interlayer. Safelite PVB is a laminated safety glass made with a Polyvinyl Butyral (PVB) interlayer.

Safety

When subjected to impact, the bond between the glass and interlayer adhere any broken fragments, keeping the glass intact and resisting penetration.

This important breakage characteristic significantly reduces the likelihood of serious injury, qualifying laminated glass as a Grade A safety glass in accordance with AS/NZ 2208 and other international standards. In addition, the glass will not fall out if used in sloped or overhead glazing applications providing environmental protection.

Climate Control

Laminated glass can have a tinted interlayer or be made with tinted or reflective glass to reduce glare and heat gain in a building. It can also be made with Low E coating to reduce heat loss from the building and thus save on energy costs.

Glass - Low E coating

Special clear Low Emissivity (Low E) coatings can be applied to a float glass surface to make it reflective to short wave radiation from the sun and long wave radiation from heat inside the building. This greatly raises the efficiency of the glazing system.

Panels should be installed with the Low E coating on the inside (ie not facing into the room).

For cleaning - Apply Mr Muscle Blue Glass Cleaner, rub carefully with a lint free cloth, wipe dry.

Do not use ammonia or alcohol based cleaners, blades or squeegees.

Installation Tips

- On first inspection, make sure all window joinery (especially wooden) is in good repair. If not do not proceed
- Inspect joinery for any gaps or cracks causing air leakage. Rectify and seal up
- Installation should be only be done on a low humidity day.
 - Trapping humid air inside the secondary glazing unit will lead to condensation
- Recommended trapped air gap is about 20mm min
- Check Large window sizes - If not properly supported the Sill sections may not cope, especially if using Laminated Glass

- Fixed Window (Single) Thoroughly clean inside of exterior window. Thoroughly clean inside of interior secondary glazing panel. 'Dry fit' the panel, marking locations if necessary. Remove panel and peel off double sided tape outer strips. Reinstall pushing firmly all around the frame to ensure the tape is adhering firmly. Hold in place for 30 seconds. Thoroughly clean room side of the secondary glazing panel.
 - Note 1 : The panels are installed with all the clip beads pre inserted into the clip sash. If installing a fixed panel as part of a fixed/sliding combination make sure the interlock strip on the fixed panel is installed plumb.
 - Note 2 : Do not install on poorly sealed joinery. Must be repaired first to airtight. If necessary use double slider system.
 - Note 3 : Make sure all tracks are installed level. Pack if required.

- Awning/Casement Window - Install Top Track, Bottom track. Singles for single sliding, double for double sliding
 - Thoroughly clean inside of exterior window. Thoroughly clean inside of interior secondary glazing.
 - Insert Aluminium Frame(s) containing Interior glazing in place making sure effectively sealed all round with mohair.
 - Thoroughly clean room side of interior secondary glazing.

3M VHB Double sided Tapes

Product Description

3M VHB Tapes are a family of double-sided foam tapes made from high performance acrylic adhesives. These tapes are able to form bonds of exceptional strength and have greater durability and elasticity than conventional double-sided foam tapes. The VHB Tape product range includes tapes with different core constructions and a variety of adhesives. All 3M VHB Tapes use closed cell technology, and provide outstanding environmental resistance and durability. The superior performance of 3M VHB Tapes means they can often be used to replace mechanical fasteners for joining a wide range of materials.

How 3M VHB Tapes Work

The exceptional performance of these tapes comes from the properties of the acrylic core. The core has the dual properties of behaving like a very viscous liquid and an elastic solid. This property is known as viscoelasticity. The "visco" properties allow the adhesive to flow into the microscopic irregularities of the surface to form very strong bonds. The elastic properties allow these tapes to absorb dynamic loads, accommodate differential expansion between surfaces and help distribute loads over the greatest possible area. The elastic properties are maintained between -40°C and 90°C.

3M SCOTCH HIPA CLEANER

Product Description

HiPA Clean 300 is an IPA spray that cleans surfaces prior to the application of a 3M Tape or Adhesive. Packaged in an aerosol, the product is easy to apply, and quickly and effectively cleans grease, oil, and dirt from many types of substrates. Being IPA based, the product is user friendly, and dries quickly leaving no residue.

Outstanding features

- Is easy and safe to use.
- General purpose surface preparation.
- For use most surfaces including all types of plastic
- Leaves no residue
- Dries quickly
- Extension tube — to reach hard to get at surfaces and give accurate control.

Directions For Use

1. Hold can upright 150mm to 200mm from the surface and spray a wet even coating of solvent over the surface to be cleaned.
2. Wipe off using a clean cloth or tissue while still wet.
3. Do not reuse the same part of the wiping article as this may re-contaminate the cleaned area.
4. For thorough cleaning, redo the surface three times to remove all residue.

3M TAPE PRIMER 94

Product Description

3M Tape Primer 94 can be used to promote adhesion of 3M tapes to surfaces such polyethylene, polypropylene, ABS, PET/PBT blends, concrete, wood, glass, metal and painted metal surfaces.

Surface Preparation

The bonding surface must be clean and dry. The recommended cleaning is with HiPA Clean 300. Directions above. Alternatively surfaces could be cleaned with a 50/50 Isopropyl Alcohol and water mixture. A clean lint-free cloth should be used.

Application

Shake 3M primer 94 well before using.

Apply a thin uniform coating to the bonding surface using the minimum amount that will fully coat the surface.

Allow 3M primer 94 to dry thoroughly before applying tape. This is usually accomplished in 5 minutes at room temperature.

Be sure the primed surface remains free from contaminants prior to applying the tape.

Porous surfaces may require 2 applications of 3M primer 94 for uniform coverage and good adhesion.

Allow the first application of primer to dry before applying the second coat. 3M primer 94 may be applied with brush or swab.

It can also be applied with a pressurized flow gun, knurled roller or other similar type of application equipment.

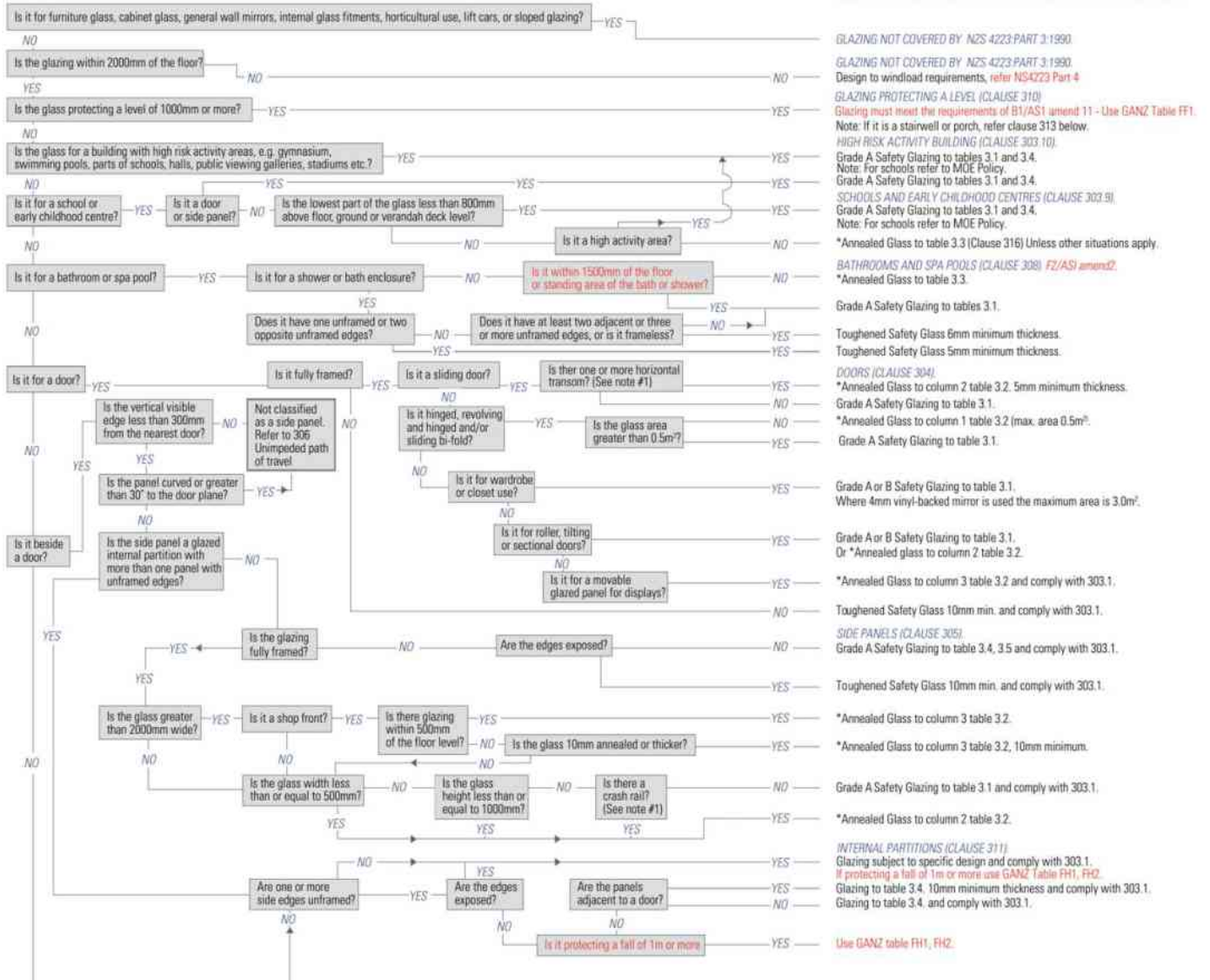
Clean up: 3M primer 94 can be removed with isopropyl alcohol. Vigorous scrubbing may be required.

A Guide to Human Impact Safety Requirements

NZS 4223- Part 3 - 1999

Incorporating NZ Building Code changes up to April 2013

***SAFETY GLASS MEETS THE REQUIREMENTS OF EVERY SITUATION.**



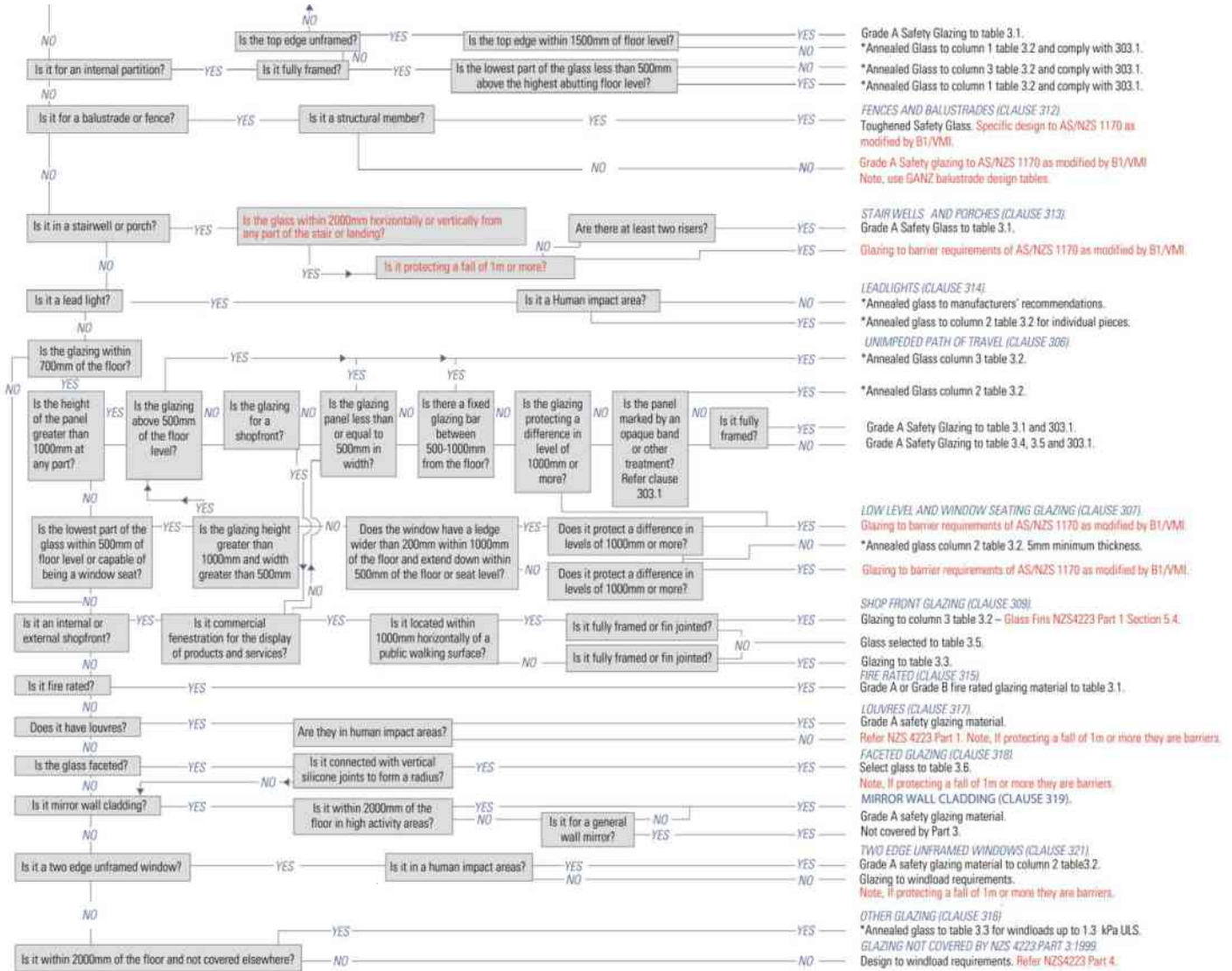
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A Guide to Human Impact Safety Requirements

NZS 4223- Part 3 - 1999

Incorporating NZ Building Code changes up to April 2013

Chart from prev page

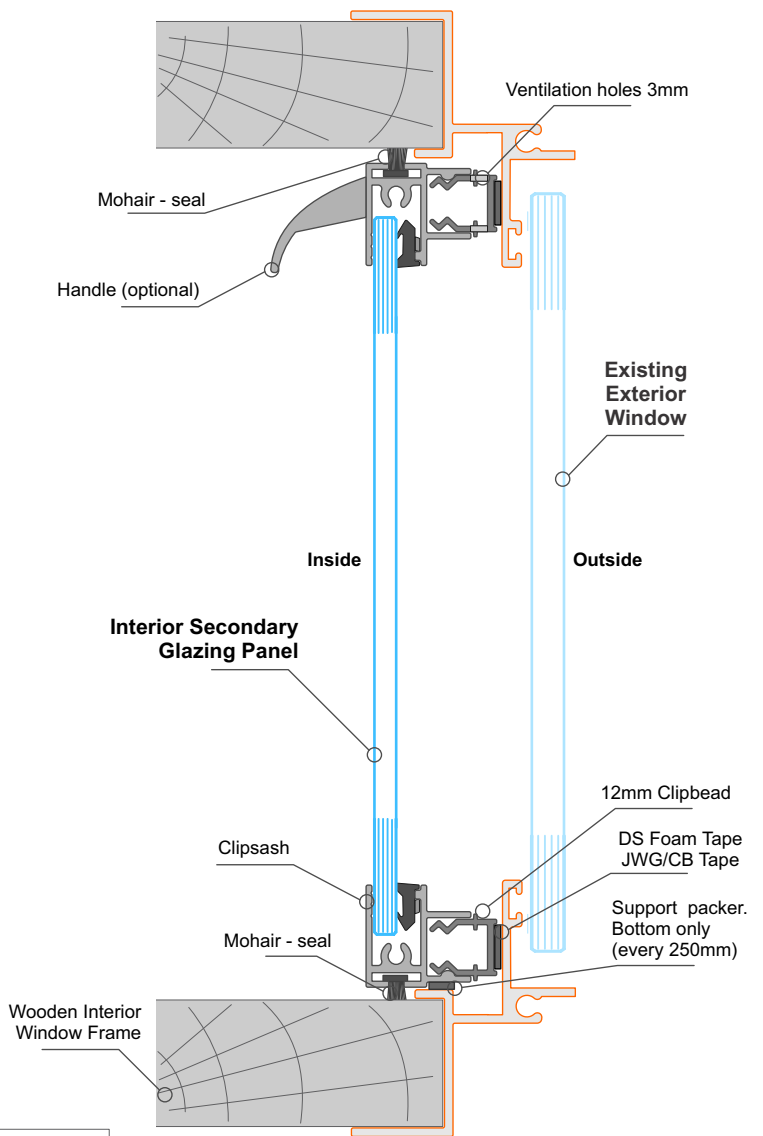
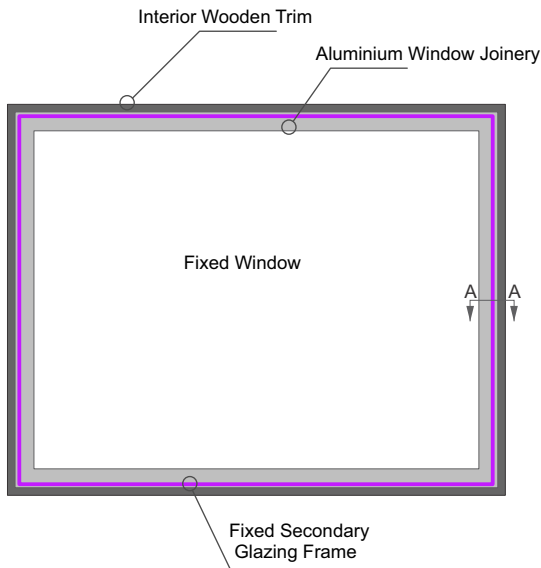


Finish

Juralco Winterglaze® Secondary Glazing System - Aluminium Joinery Layouts

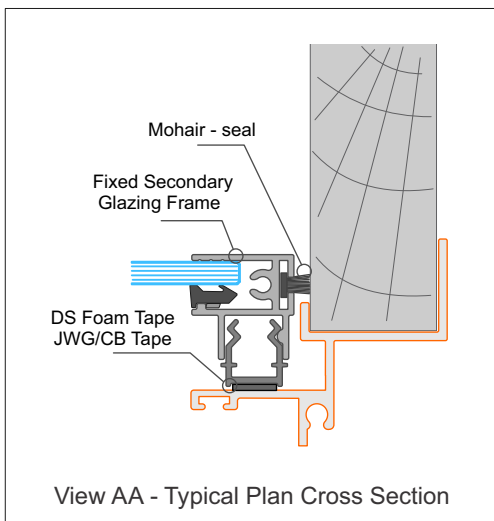
Typical Fixed Window/Aluminium Joinery Installation

Clearance - Glass edge to Frame, 1-2mm on all sides
 Clearance - Acrylic edge to Frame, 2-3mm on all sides - expansion gap



Typical Elevation Cross Section

Notes : - Please refer page 6 for installation and cleaning tips.
 - Always use 3M Cleaner and 3M Primer for double sided tapes
 - Maximum recommended sizes, Glass 3sqmt, Acrylic 4sqmt

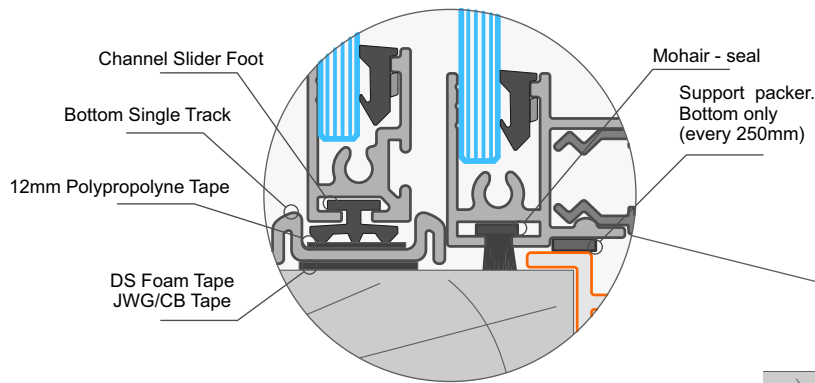
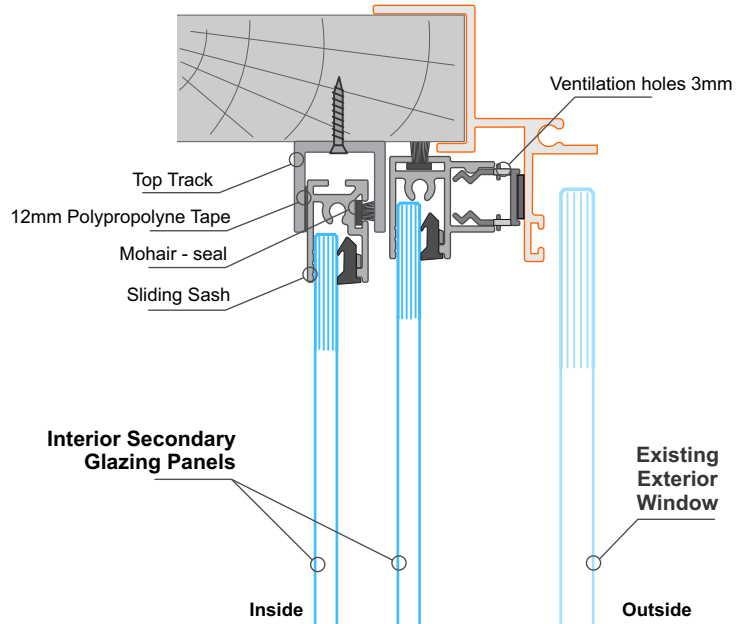
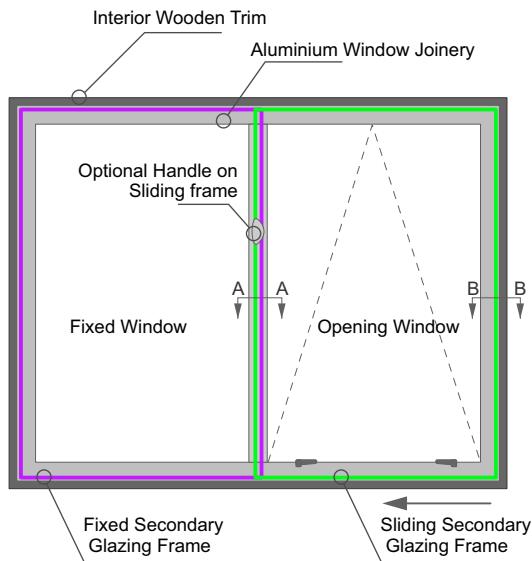


View AA - Typical Plan Cross Section

Juralco Winterglaze® Secondary Glazing System - Aluminium Joinery Layouts

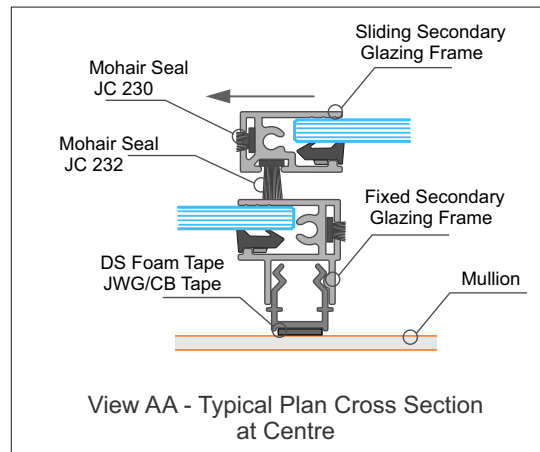
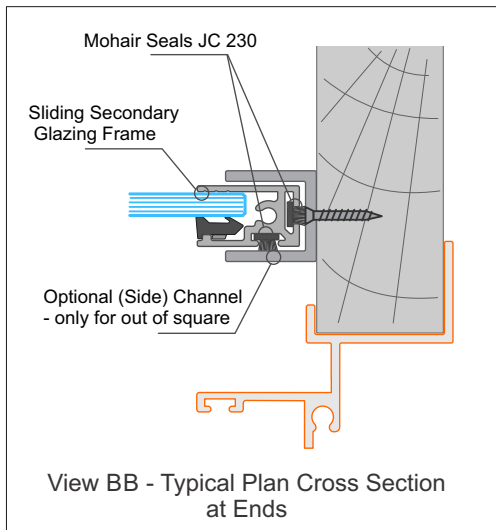
Typical 1 x Fixed Window/Aluminium Joinery and 1 x Opening Window with Sliding Glazing Installation

Clearance - Glass edge to Frame, 1-2mm on all sides
 Clearance - Acrylic edge to Frame, 2-3mm on all sides - expansion gap



- Notes :
- Please refer page 6 for installation and cleaning tips.
 - Always use 3M Cleaner and 3M Primer for double sided tapes
 - Bottom track must be installed level - pack if necessary.
 - Interlock seal must be plumb.
 - Maximum recommended sizes, Glass 3sqmt, Acrylic 4sqmt

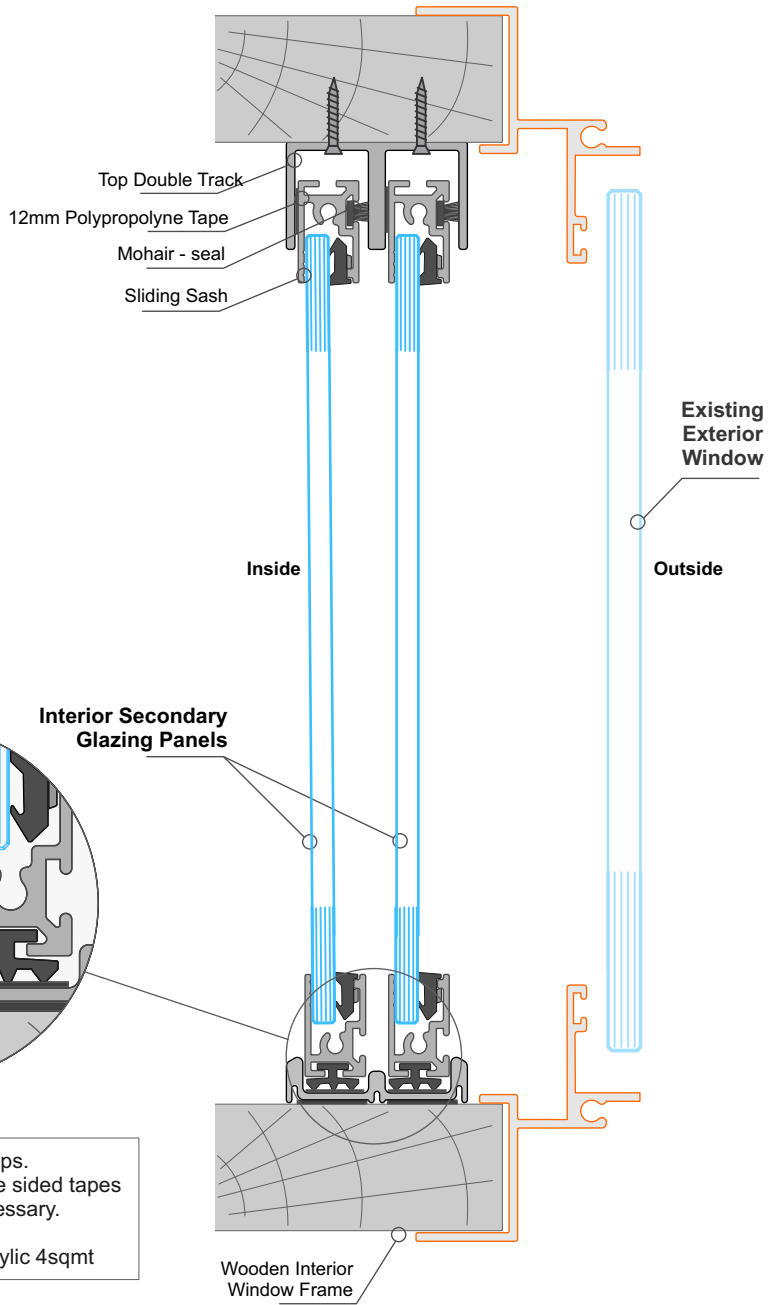
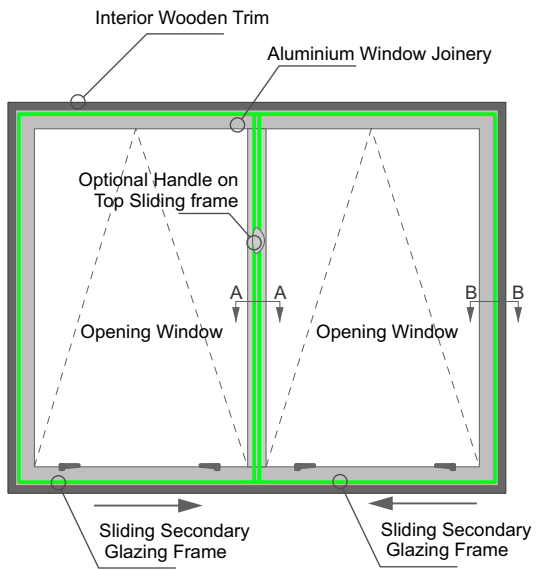
Typical Elevation Cross Section



Juralco Winterglaze® Secondary Glazing System - Aluminium Joinery Layouts

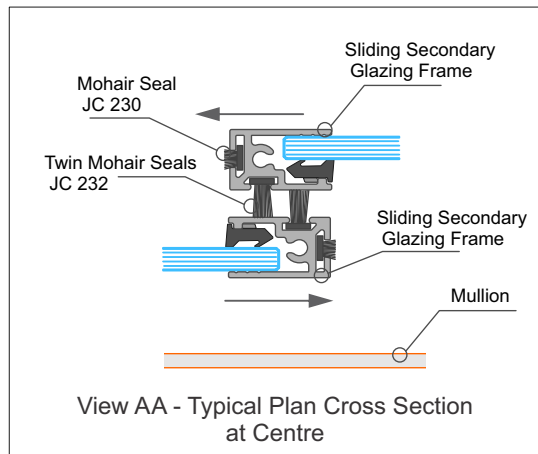
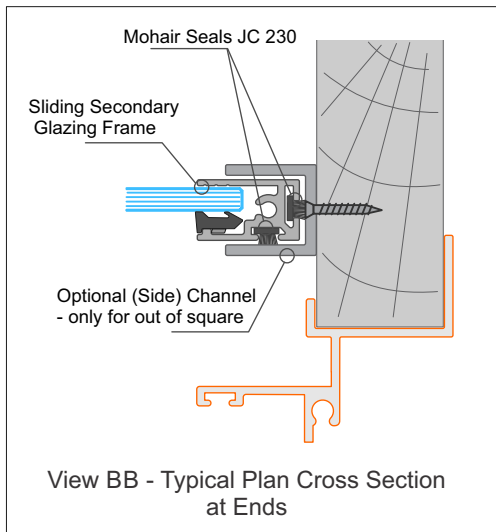
Typical 2 x Opening Windows with Sliding Glazing Installation

Clearance - Glass edge to Frame, 1-2mm on all sides
 Clearance - Acrylic edge to Frame, 2-3mm on all sides - expansion gap



- Notes :
- Please refer page 6 for installation and cleaning tips.
 - Always use 3M Cleaner and 3M Primer for double sided tapes
 - Bottom track must be installed level - pack if necessary.
 - Interlock seal must be plumb.
 - Maximum recommended sizes, Glass 3sqmt, Acrylic 4sqmt

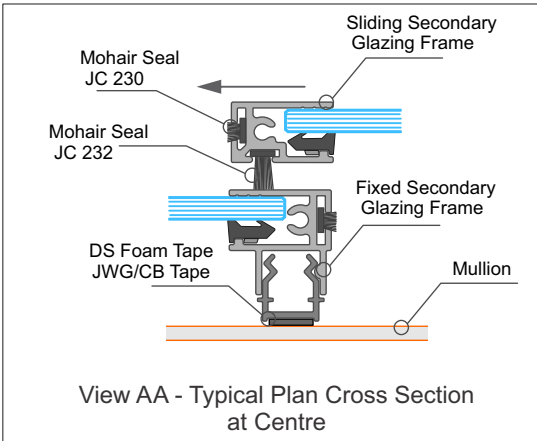
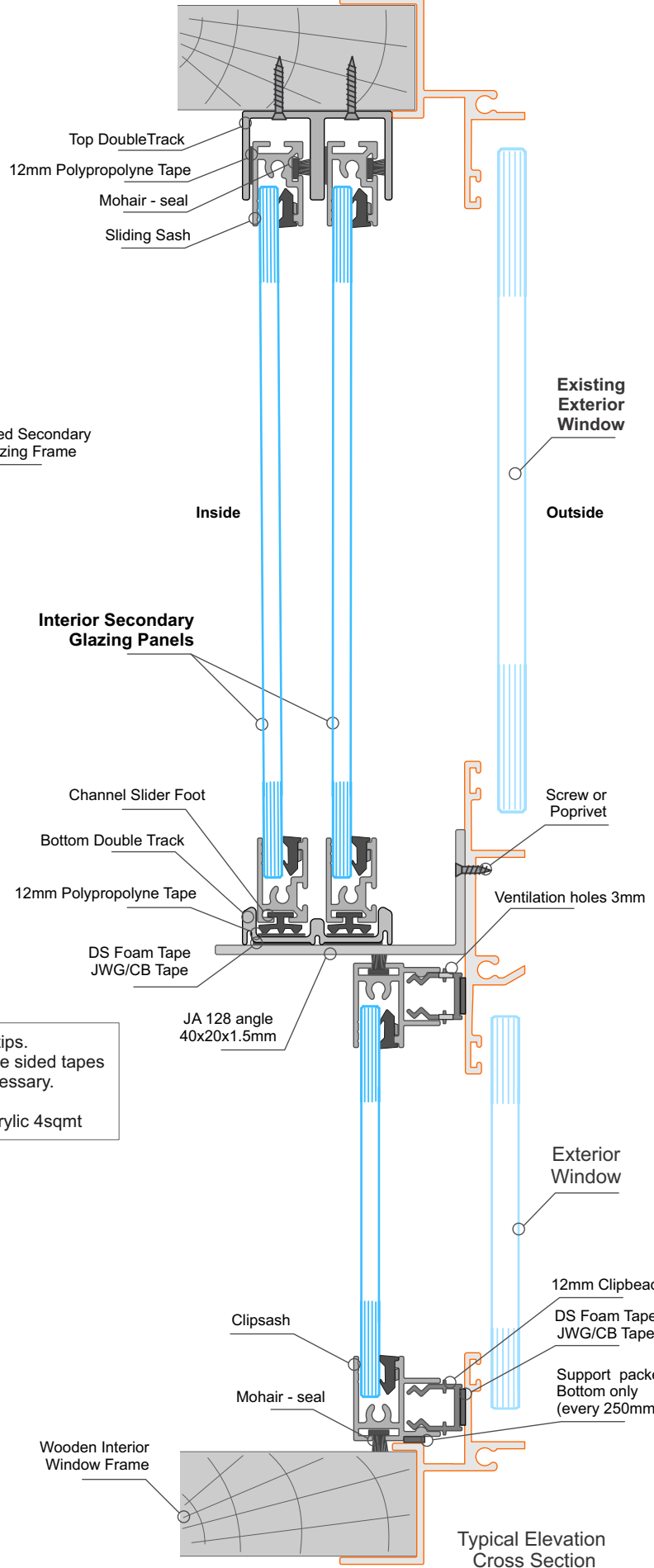
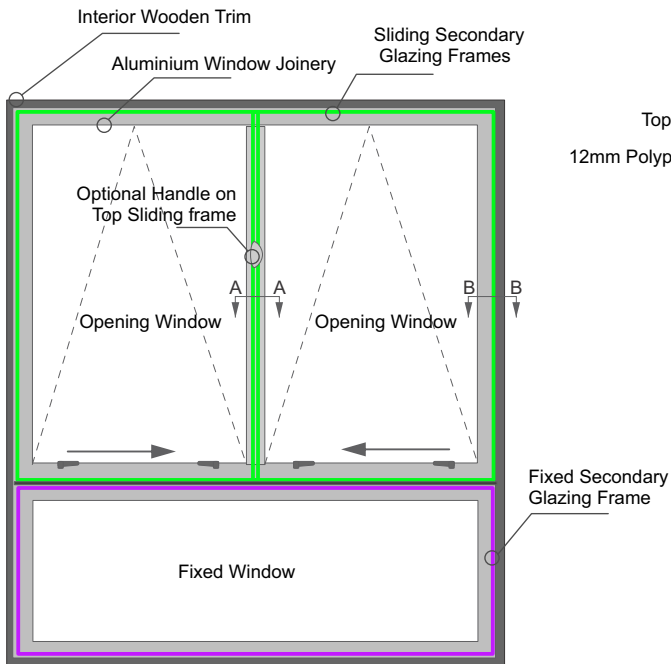
Typical Elevation Cross Section



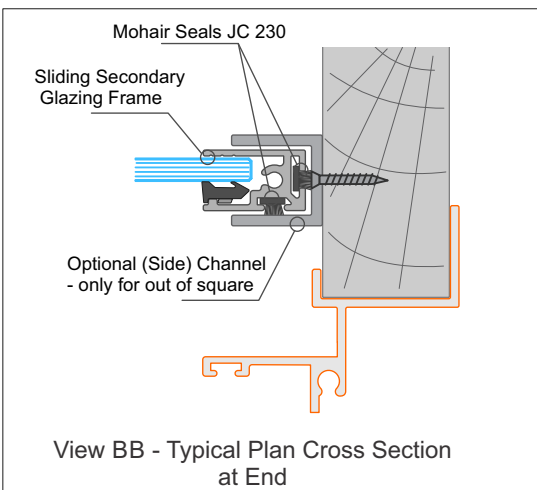
Juralco Winterglaze® Secondary Glazing System - Aluminium Joinery Layouts

Typical 2 x Opening Windows with Sliding Glazing Installation and 1 x Fixed Window

Clearance - Glass edge to Frame, 1-2mm on all sides
 Clearance - Acrylic edge to Frame, 2-3mm on all sides - expansion gap



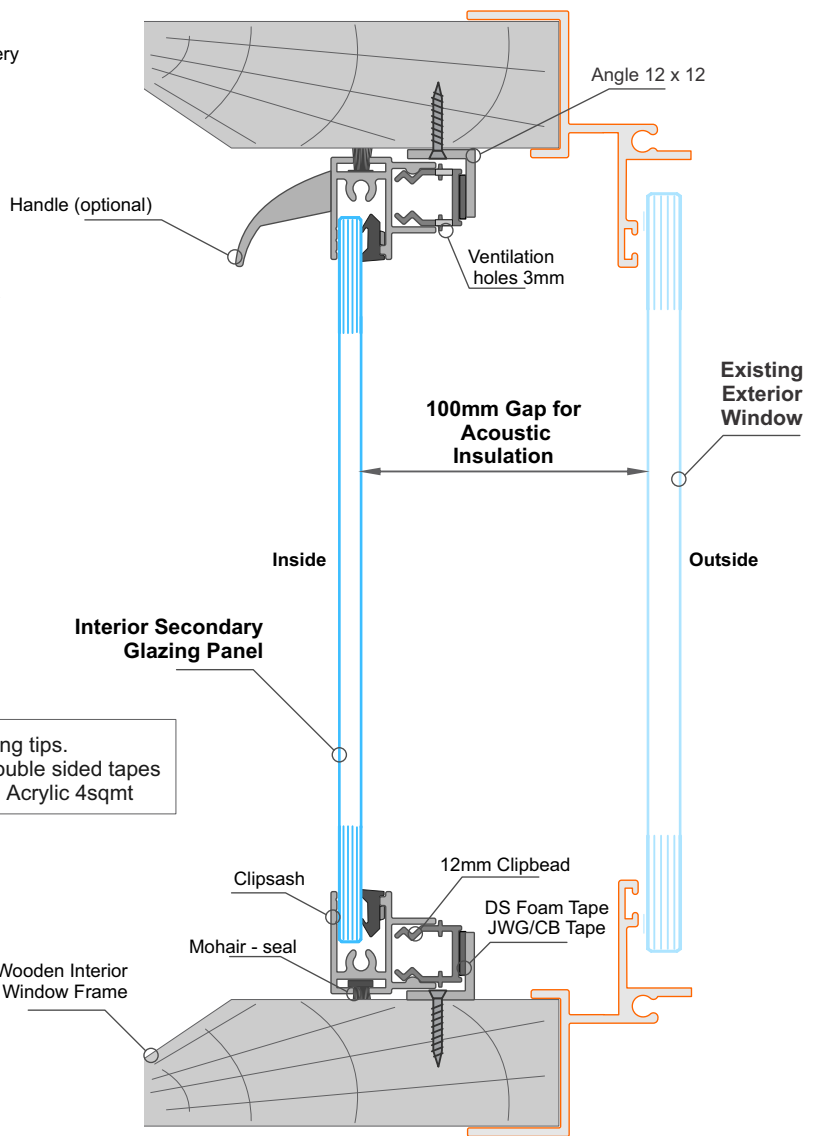
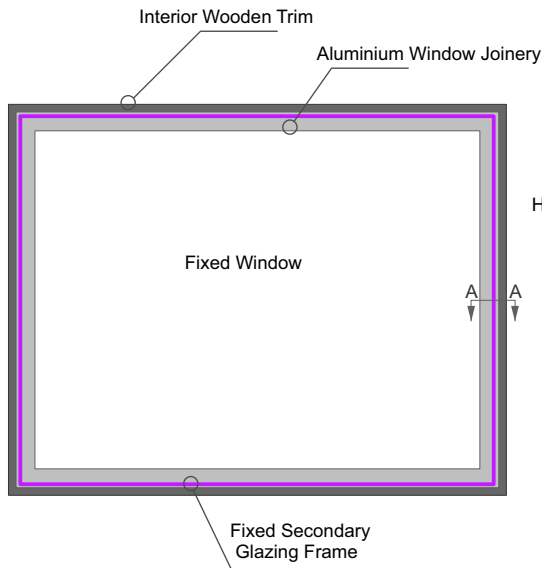
- Notes :
- Please refer page 6 for installation and cleaning tips.
 - Always use 3M Cleaner and 3M Primer for double sided tapes
 - Bottom track must be installed level - pack if necessary.
 - Interlock seal must be plumb.
 - Maximum recommended sizes, Glass 3sqmt, Acrylic 4sqmt



Juralco Winterglaze® Secondary Glazing System - Aluminium Joinery Layouts

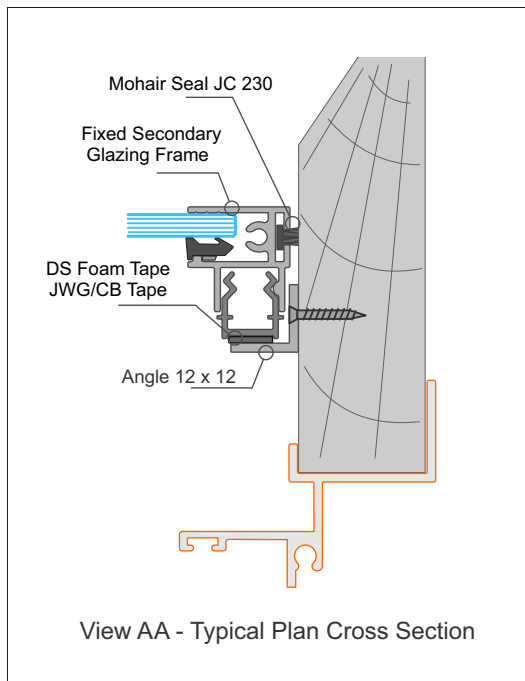
Typical Fixed Window/Aluminium Joinery Installation for Acoustics

Clearance - Glass edge to Frame, 1-2mm on all sides
 Clearance - Acrylic edge to Frame, 2-3mm on all sides - expansion gap



Notes : - Please refer page 6 for installation and cleaning tips.
 - Always use 3M Cleaner and 3M Primer for double sided tapes
 - Maximum recommended sizes, Glass 3sqmt, Acrylic 4sqmt

Typical Elevation Cross Section



View AA - Typical Plan Cross Section

Juralco Winterglaze® Secondary Glazing System - Window Cutting Allowances

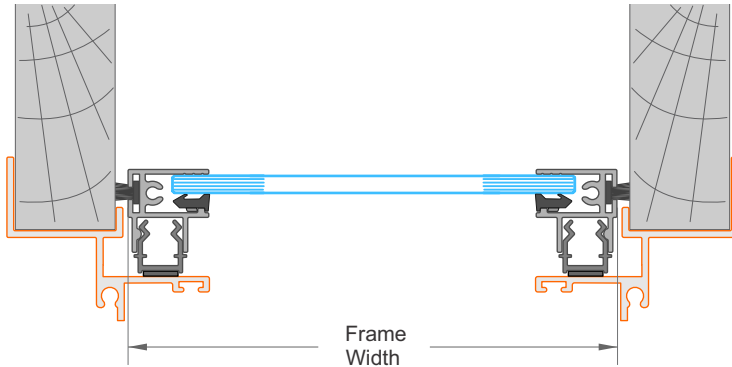
Cutting Allowances - Fixed Frames

Glass Height = Frame height - 18mm
 Glass Width = Frame width - 18mm

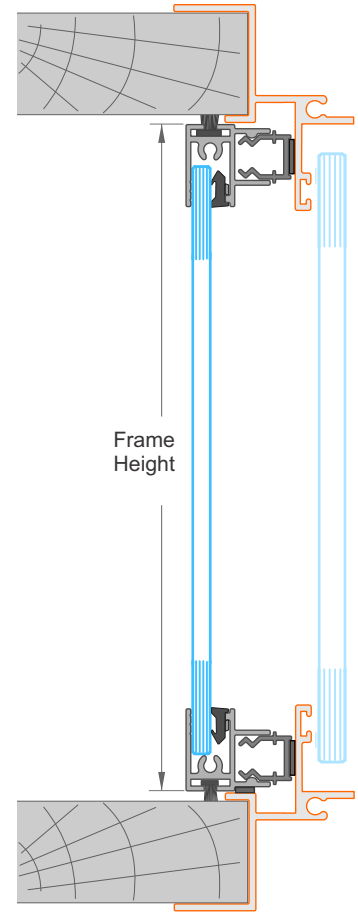
Note - Acrylic

Basically a piece of acrylic 2400mm in length will "grow" 1.56mm for every 10 degree increase in temperature or 0.65mm per metre. You will need to allow for this when ordering the finished sheet size.

Acrylic Height = Frame height - 23mm
 Acrylic Width = Frame width - 23mm



- Notes : - Always insert the clip bead into the frame before cutting
 - Always use 3M Cleaner and 3M Primer for double sided tapes refer page 6



Cutting Allowances - Sliding Frames

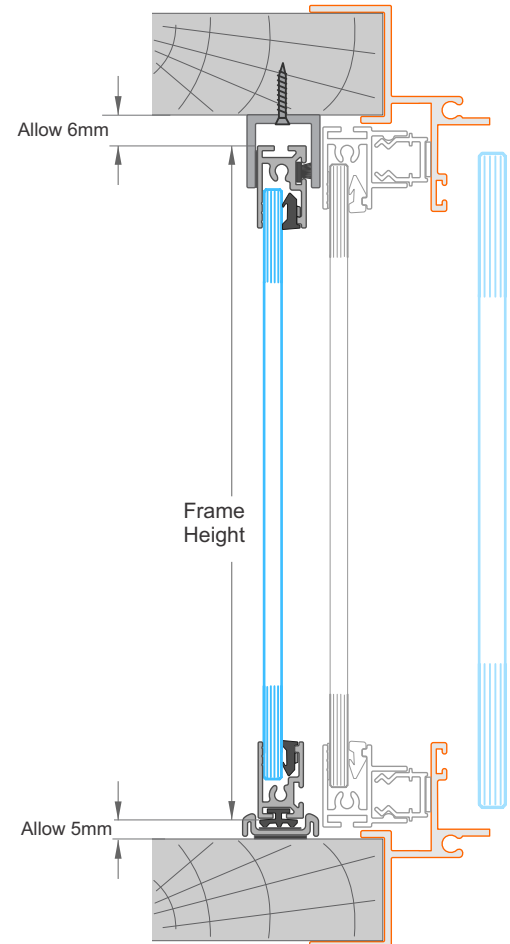
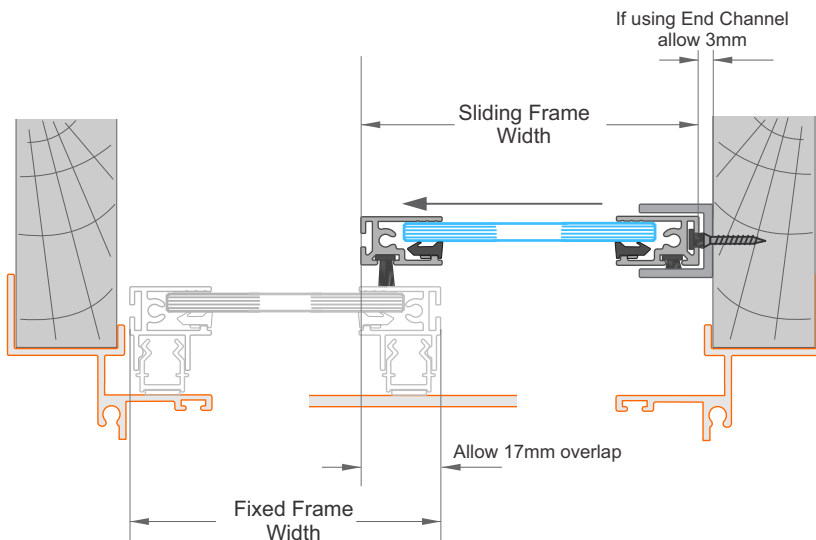
Fixed Frame same as above

Glass Height = Frame height - 18mm
 Glass Width = Frame width - 18mm

Note - Acrylic

Basically a piece of acrylic 2400mm in length will "grow" 1.56mm for every 10 degree increase in temperature or 0.65mm per metre. You will need to allow for this when ordering the finished sheet size.

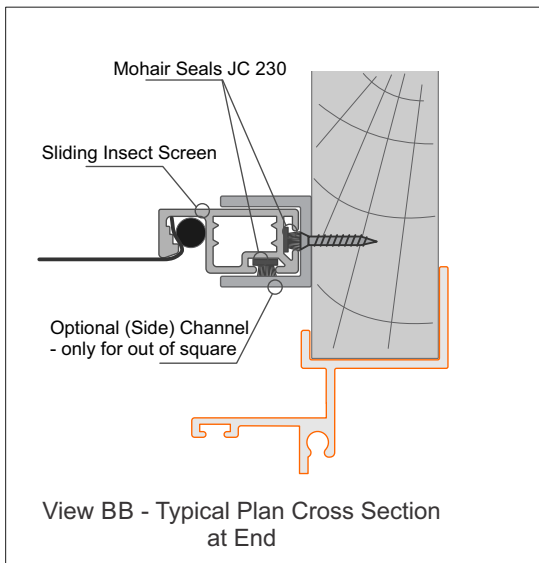
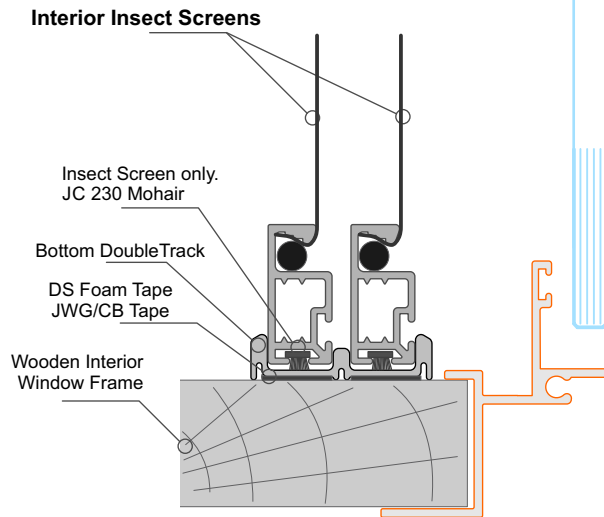
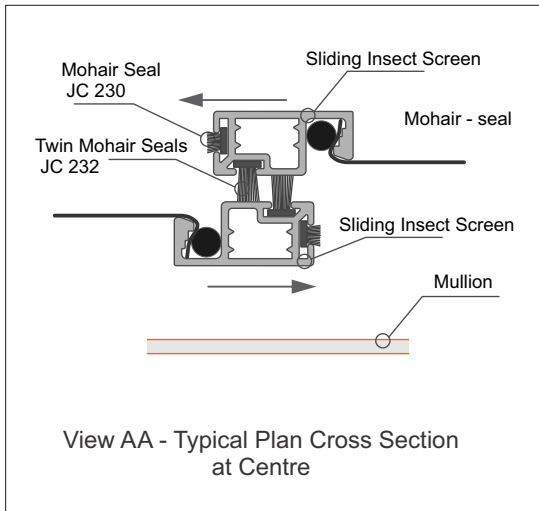
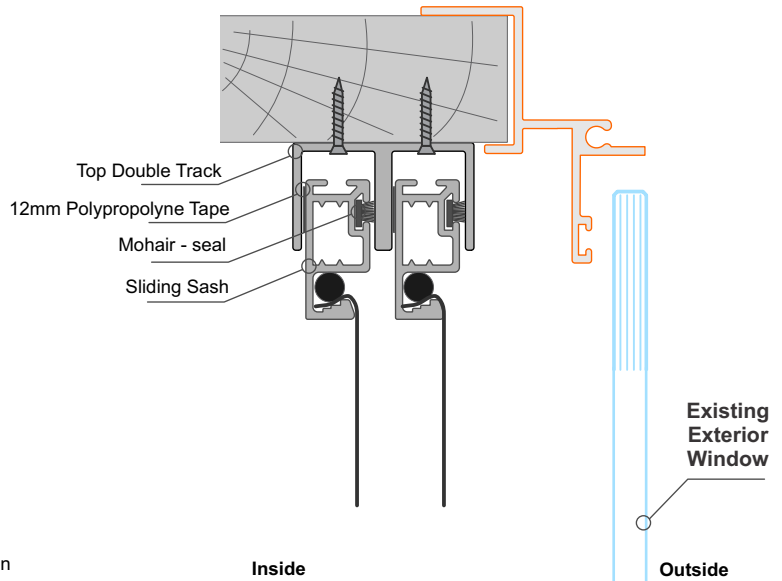
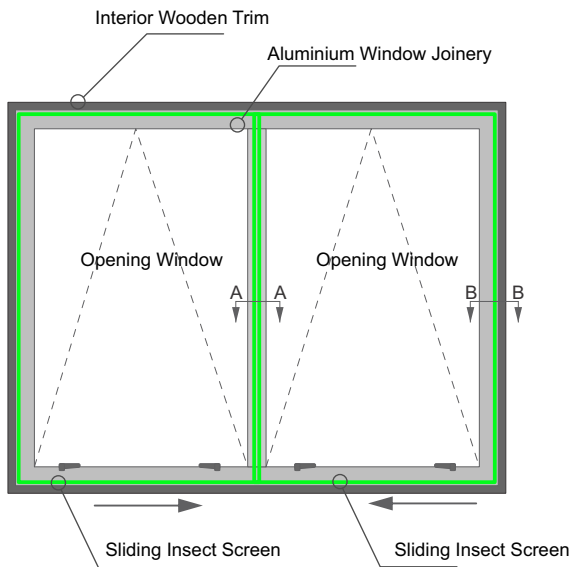
Acrylic Height = Frame height - 23mm
 Acrylic Width = Frame width - 23mm



Juralco Winterglaze® Secondary Glazing System - Insect Screens

Typical 2 x Opening Windows with Sliding Insect Screens

During Summer when Secondary Glazing is not necessary, the sliding glass screens can very easily be replaced with Insect Screens



- Notes :
- Please refer page 6 for installation and cleaning tips.
 - Always use 3M Cleaner and 3M Primer for double sided tapes
 - Bottom track must be installed level - pack if necessary.
 - Interlock seal must be plumb.