

# Revolution 54

Designer's guide



Optima

ClearThinking



**BRODIES** LLP



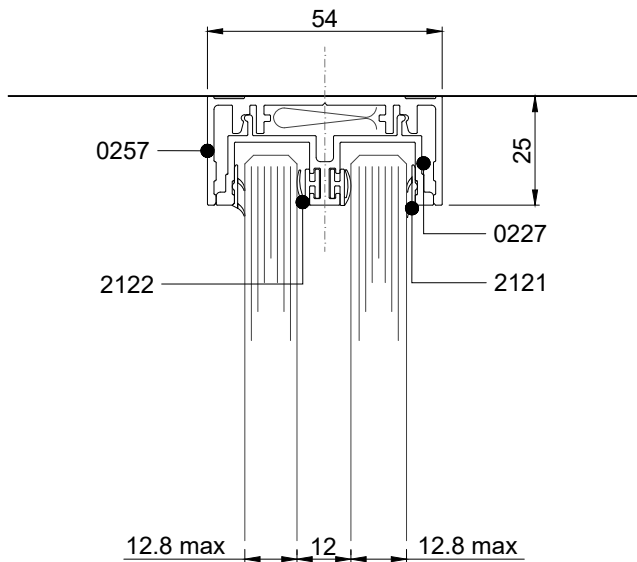


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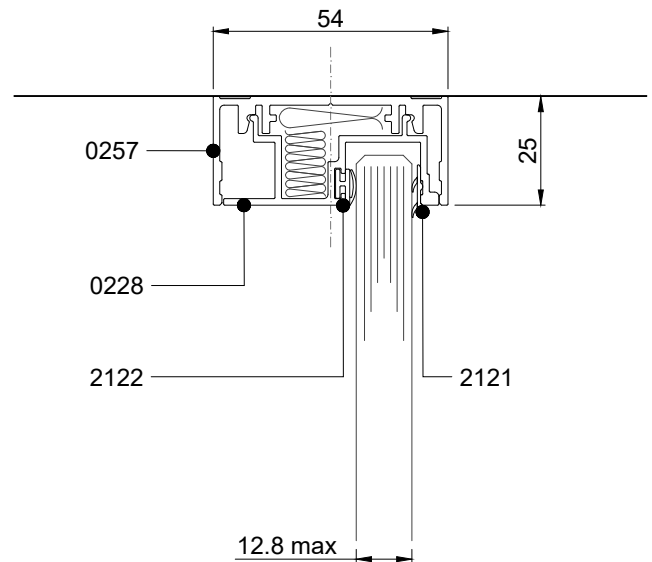
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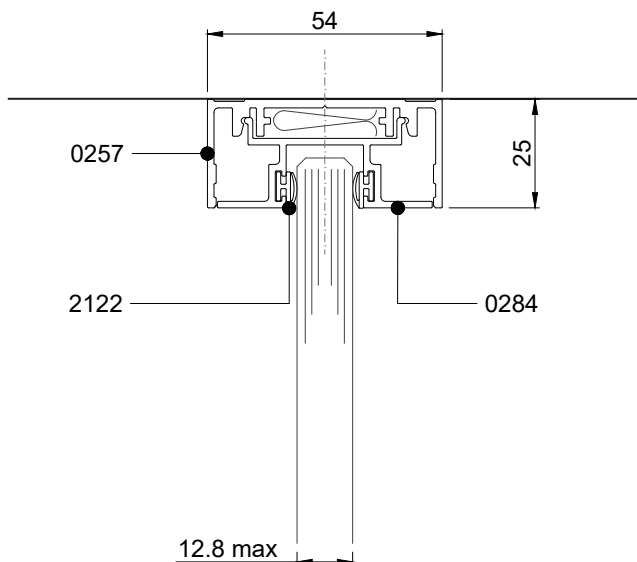
## Head Track Details: Vertical Sections Fixed Heads



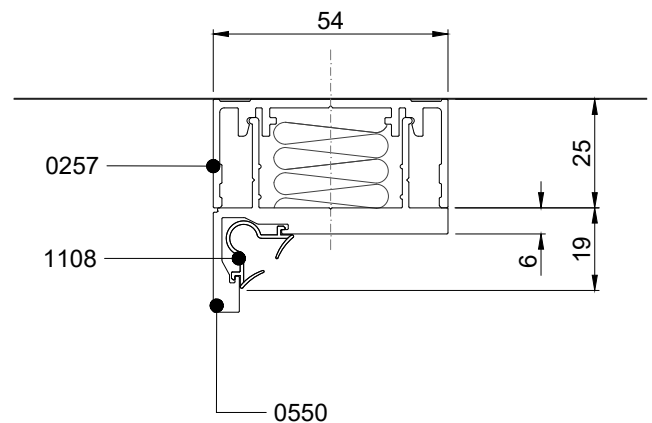
Fixed head track 25mm double glazed



Fixed head track 25mm single glazed



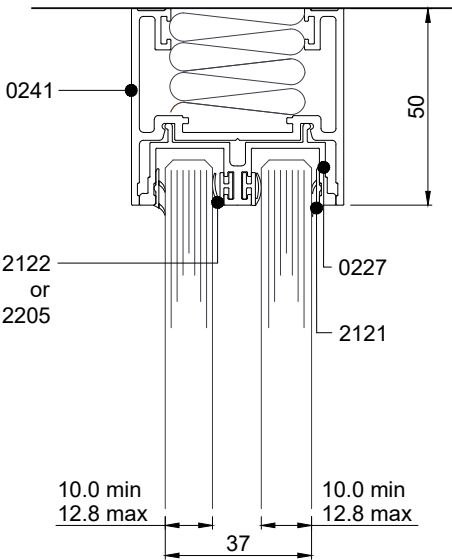
Fixed head track 25mm single glazed



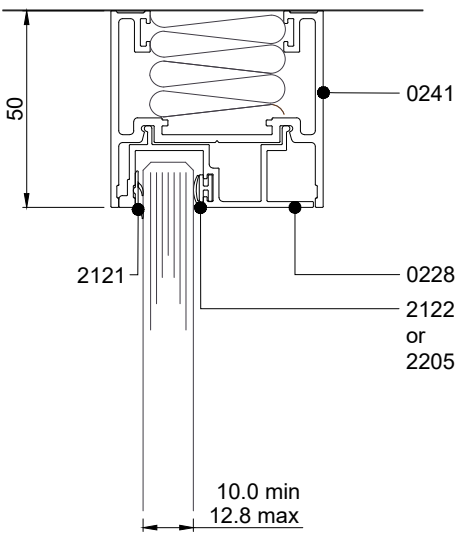
Head track 25mm with D455 door head

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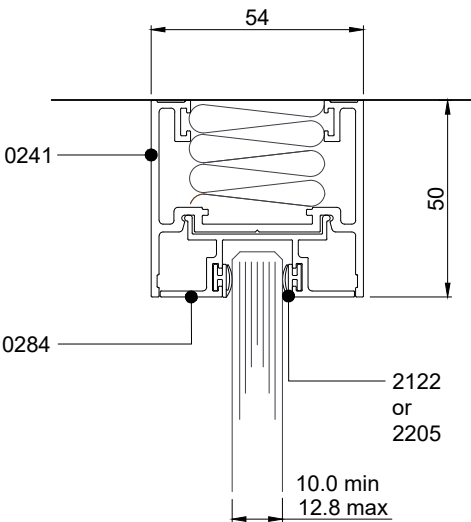
## Head Track Details: Vertical Sections Fixed Heads



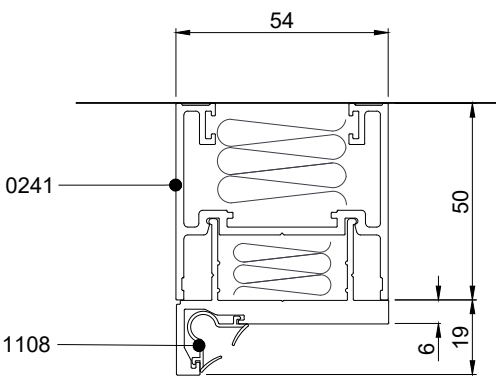
Fixed head track 50mm double glazed



Fixed head track 50mm single glazed



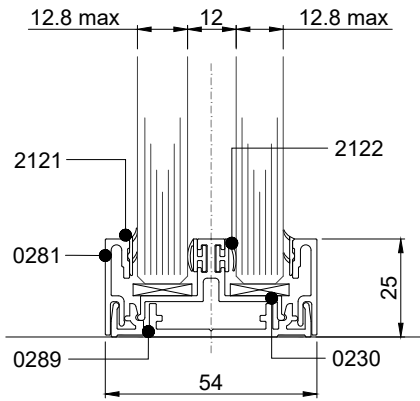
Fixed head track 50mm single glazed



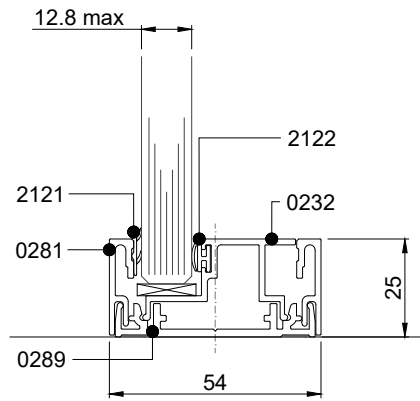
Fixed head track 50mm with D455 door head

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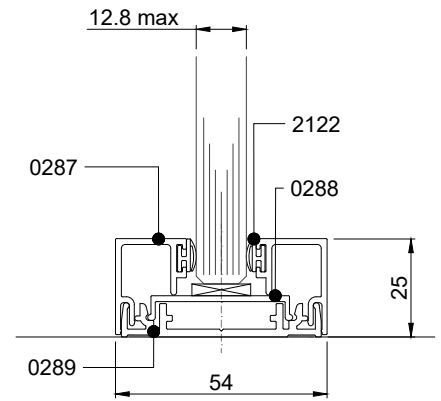
## Base Track Details: Vertical Sections Fixed Heads



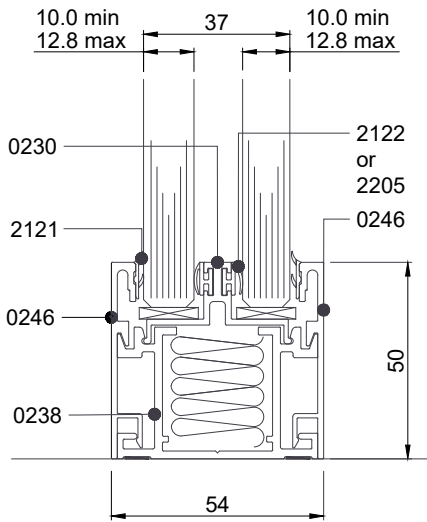
Double glazed floor track  
25mm flush clip



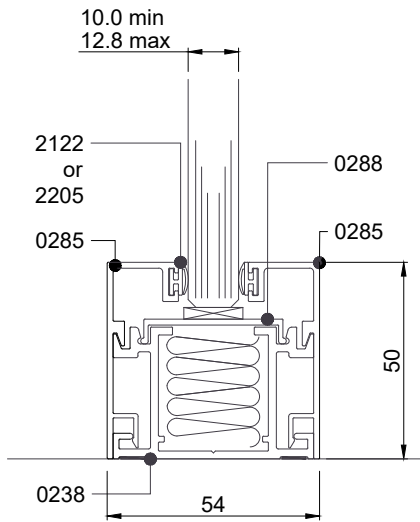
Single glazed floor track  
25mm flush clip



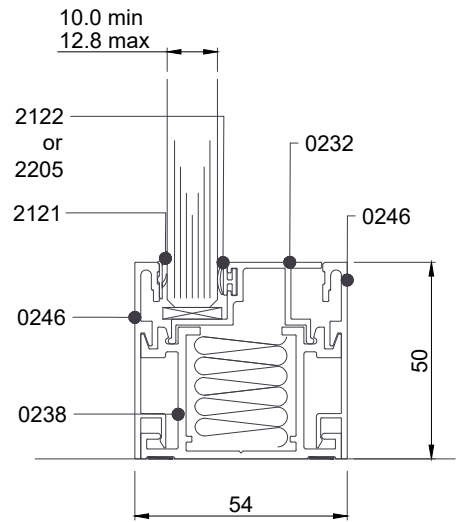
Single glazed floor track  
25mm flush clip



Double glazed floor track  
50mm flush clip



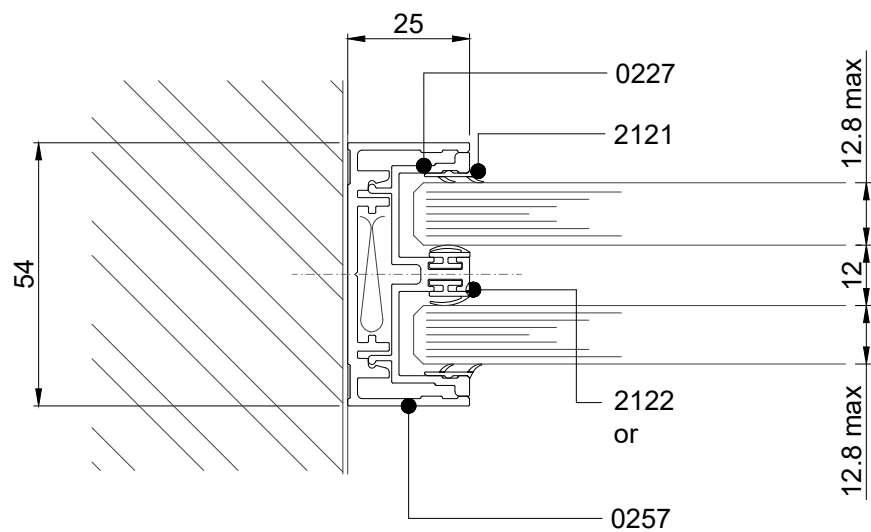
Single glazed floor track  
50mm flush clip



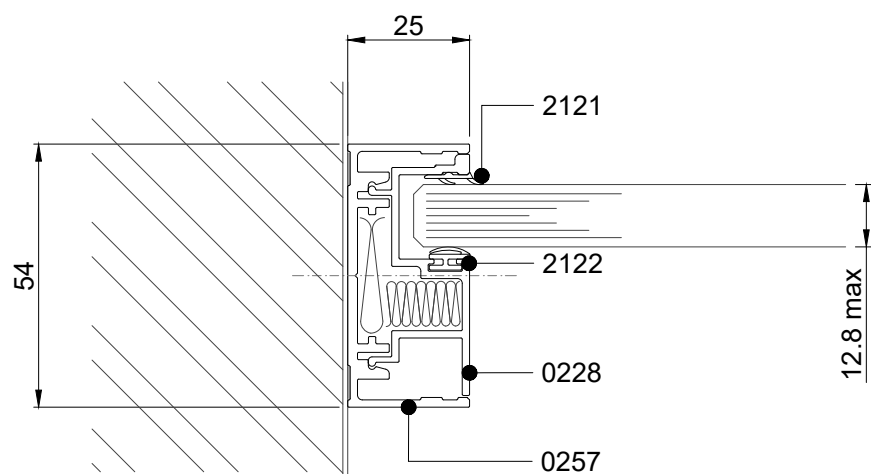
Single glazed floor track  
50mm flush clip

# Revolution 54

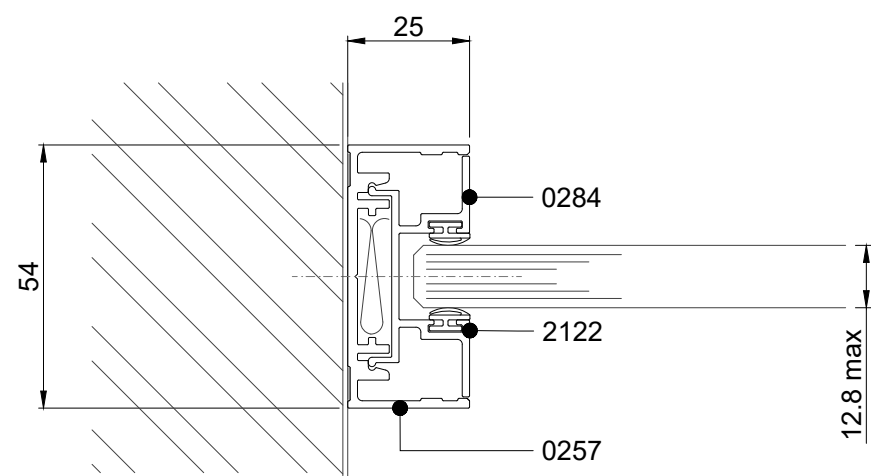
## Abutment Details: 25mm Horizontal Sections



Double glazed  
25mm wall abutment



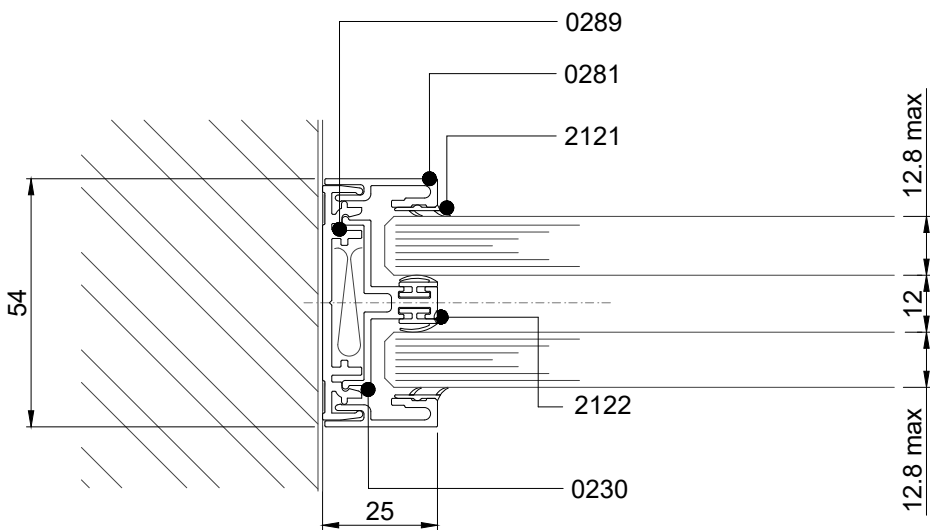
Single glazed  
25mm wall abutment



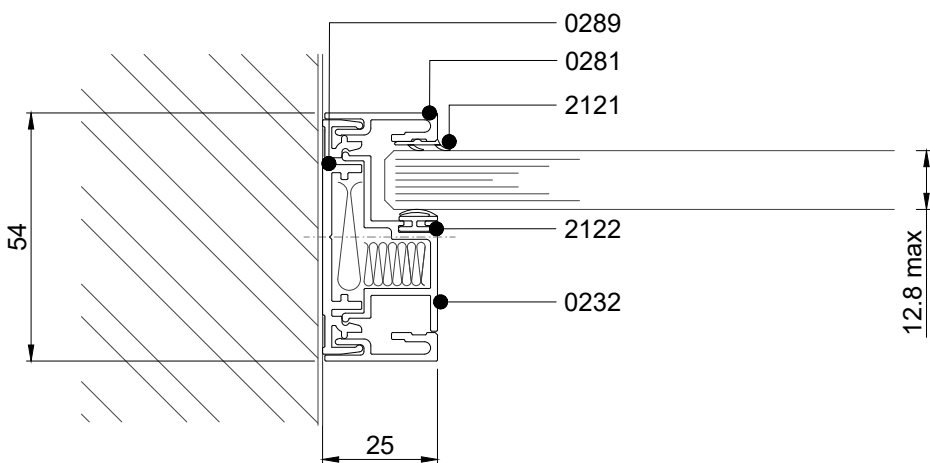
Single glazed  
25mm wall abutment

# Revolution 54

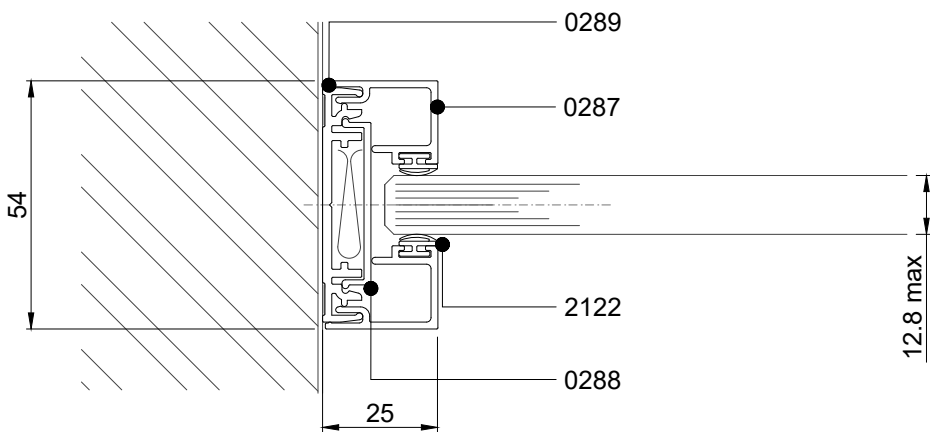
## Abutment Details: Horizontal Sections



Double glazed  
25mm wall abutment  
with removable bead



Single glazed  
25mm wall abutment  
with base channel profile  
and flush clip

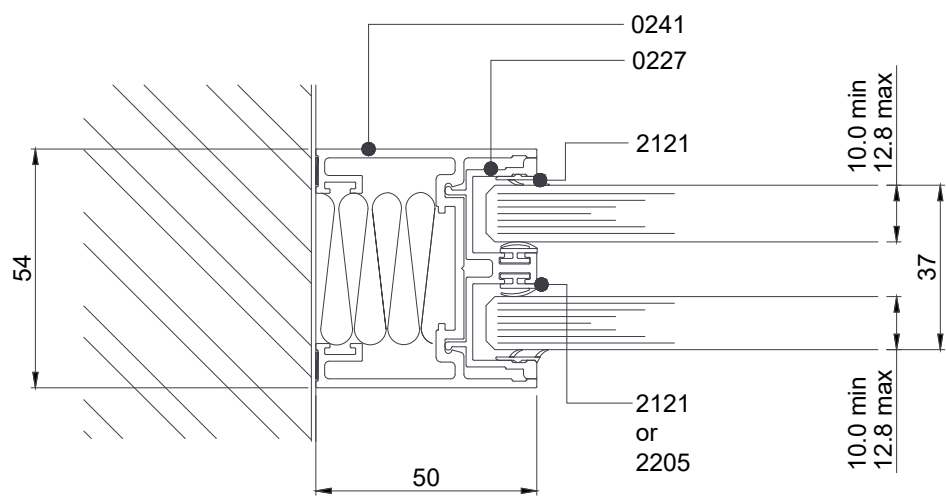


Single glazed  
25mm wall abutment  
with base channel profile  
and flush clip

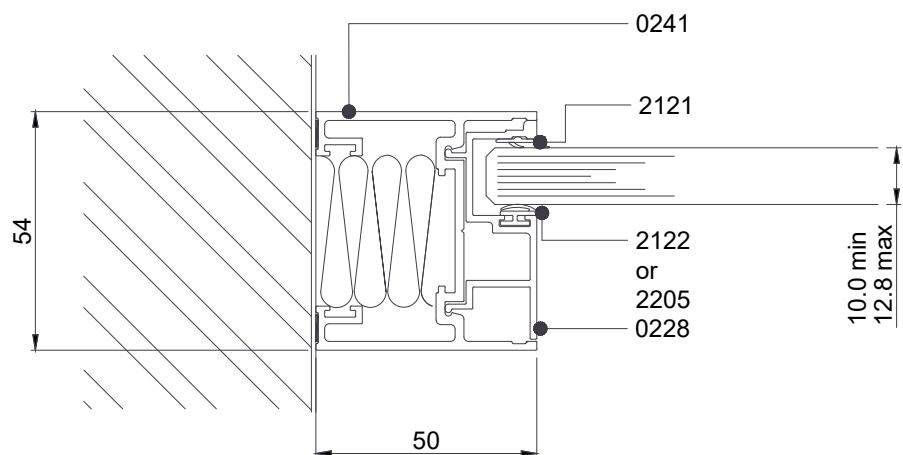


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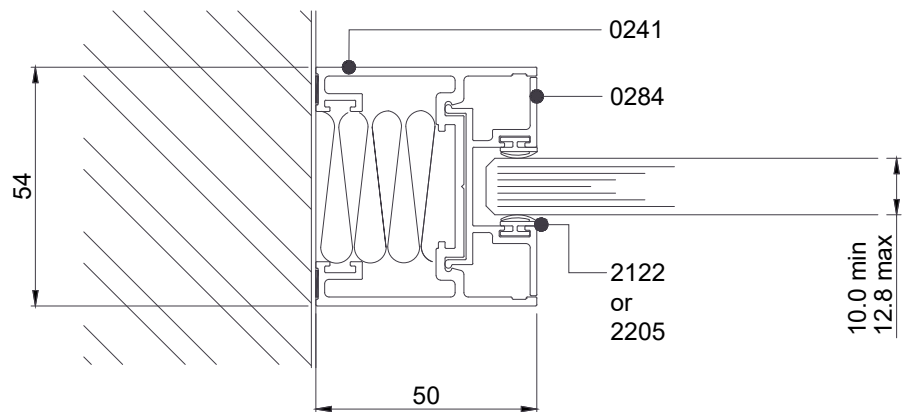
## Abutment Details: Horizontal Sections



Double glazed  
50mm wall abutment



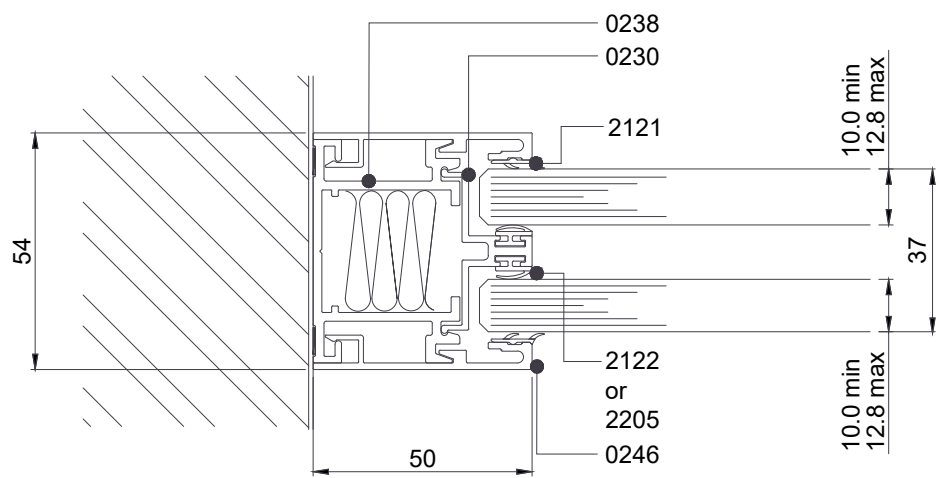
Single glazed  
50mm wall abutment



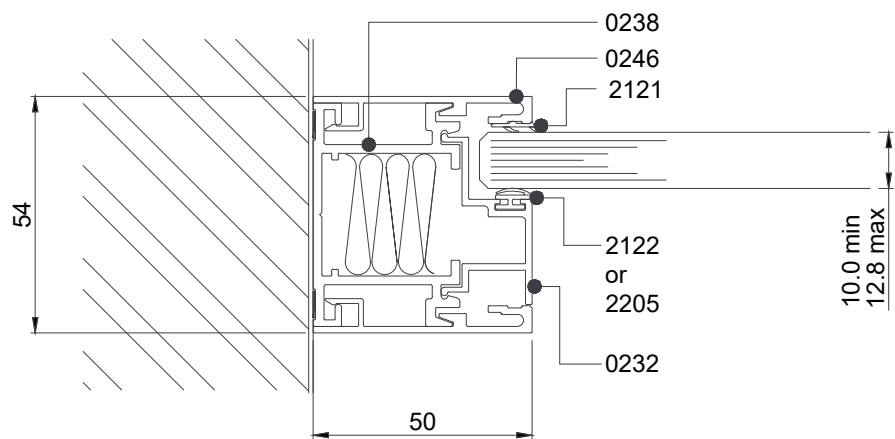
Single glazed  
50mm wall abutment

# Revolution 54

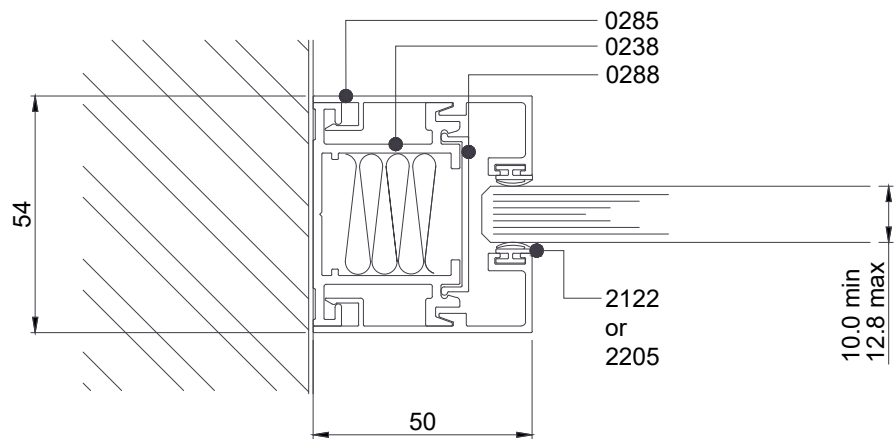
## Abutment Details: Horizontal Sections



Double glazed  
50mm wall abutment  
with removable bead



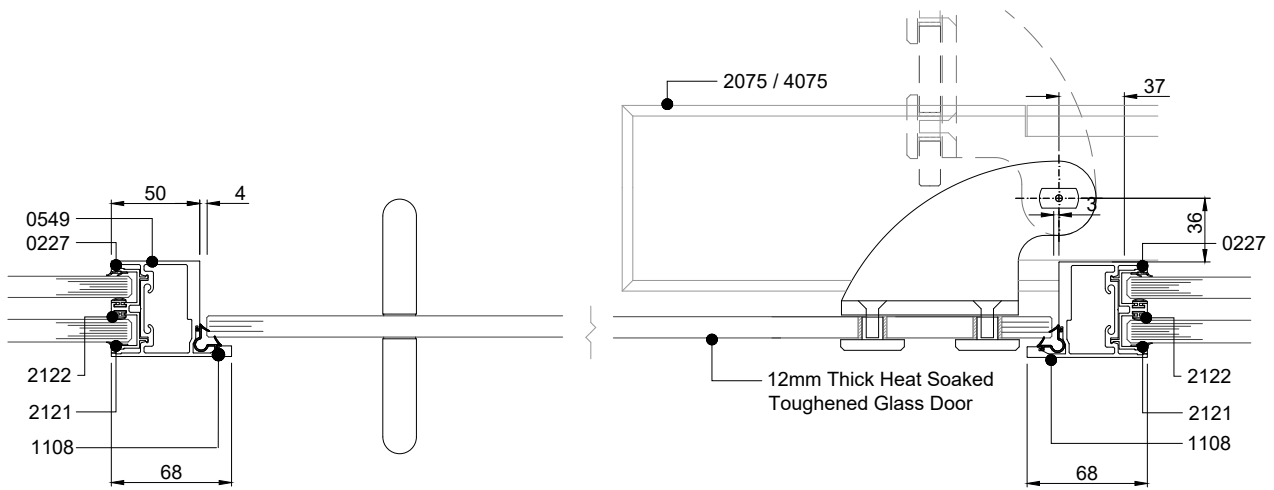
Single glazed  
50mm wall abutment  
with base channel profile  
and flush clip



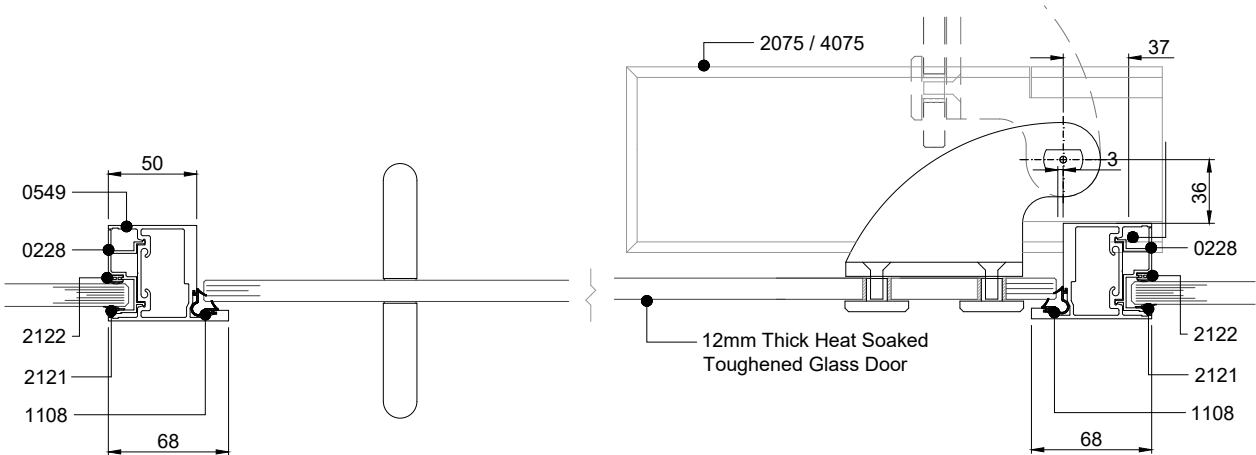
Single glazed  
50mm wall abutment  
with base channel profile  
and flush clip

# Revolution 54

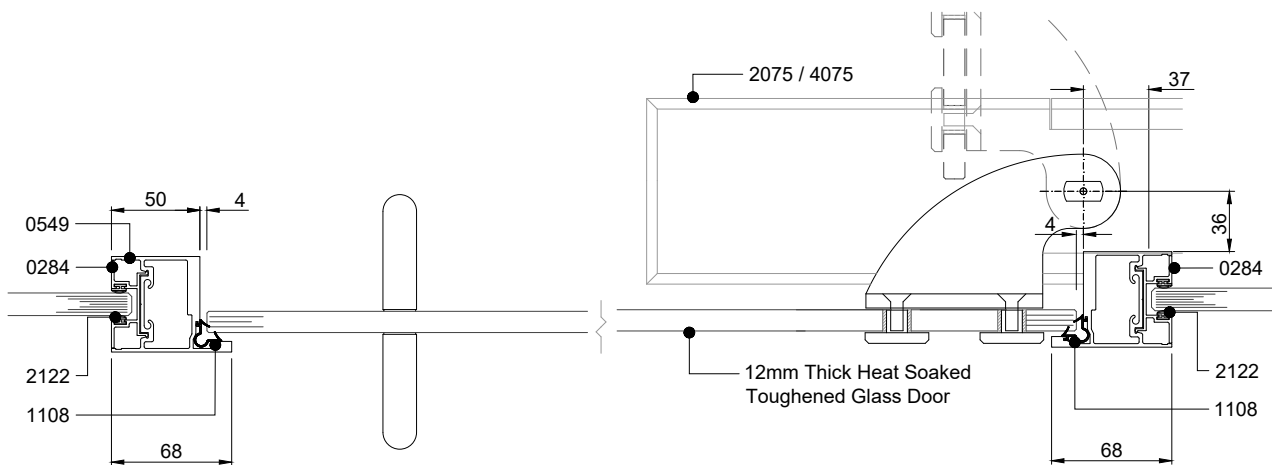
## Door Details: Vertical Sections



Double glazed abutment to Optima single glazed frameless door on offset pivot with 50mm door jamb



Single glazed abutment to Optima single glazed frameless door on offset pivot with 50mm door jamb

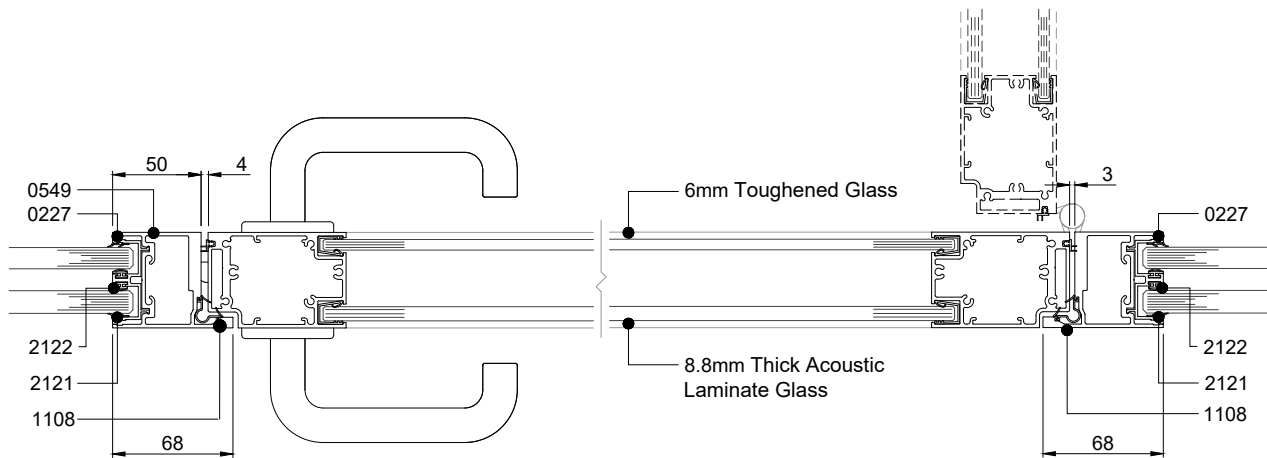


Single glazed abutment to Optima single glazed frameless door on offset pivot with 50mm door jamb

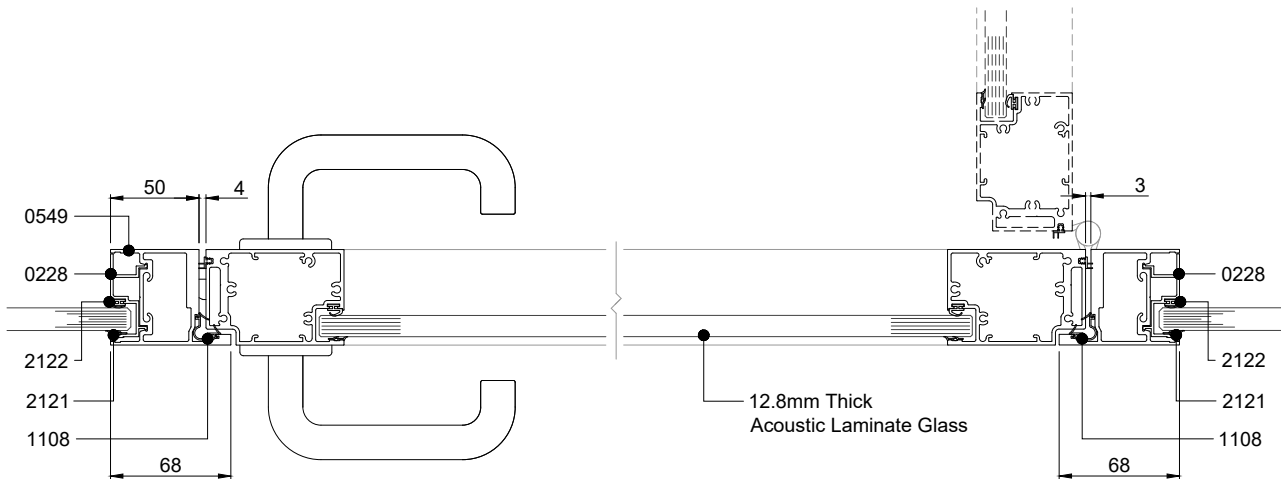


# Revolution 54

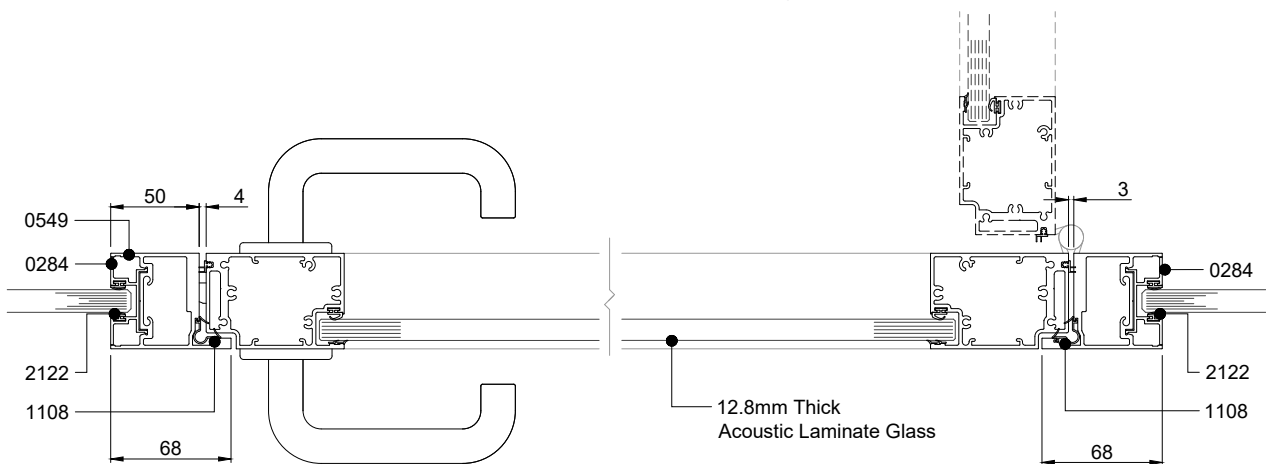
## Door Details: Vertical Sections



Double glazed abutment to double glazed hinged ASIA Affinity  
with 68mm wide D455 door jamb



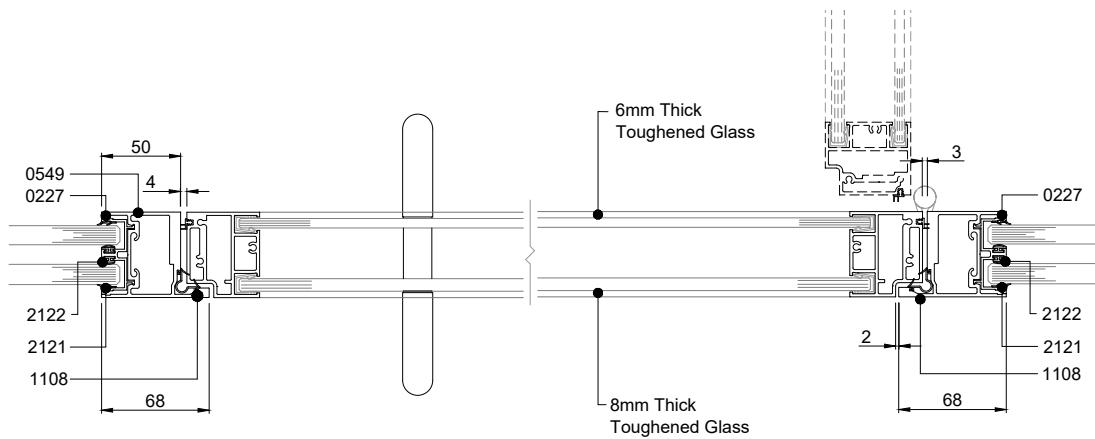
Single glazed abutment to single glazed hinged ASIA Affinity  
with 68mm wide D455 door jamb



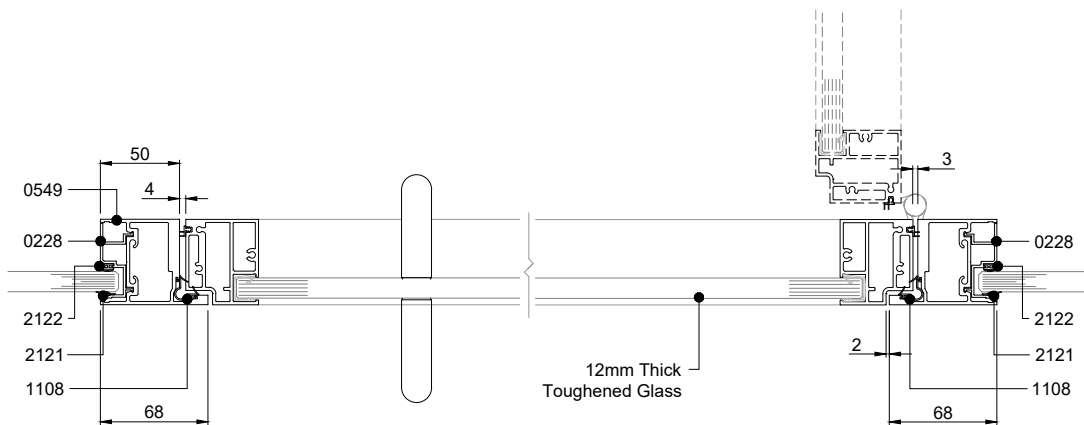
Single glazed abutment to single glazed hinged ASIA Affinity with  
68mm wide D455 door jamb

# Revolution 54

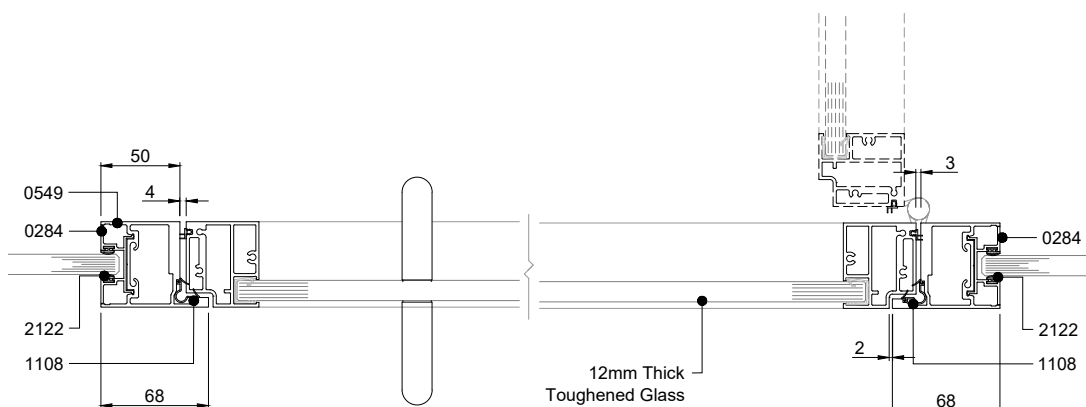
## Door Details: Vertical Sections



Double glazed abutment to double glazed hinged Edge Unity  
with 68mm wide D455 door jamb



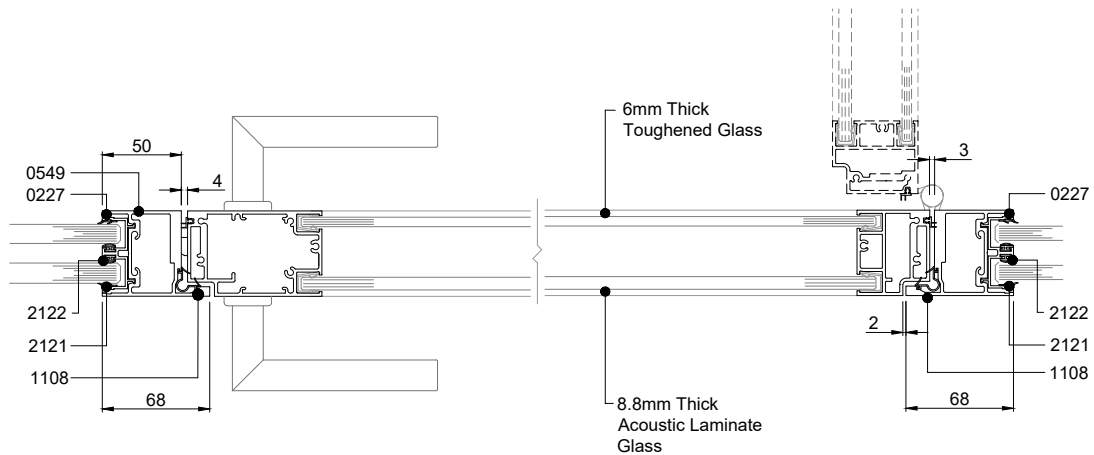
Single glazed abutment to single glazed hinged Edge Unity  
with 68mm wide D455 door jamb



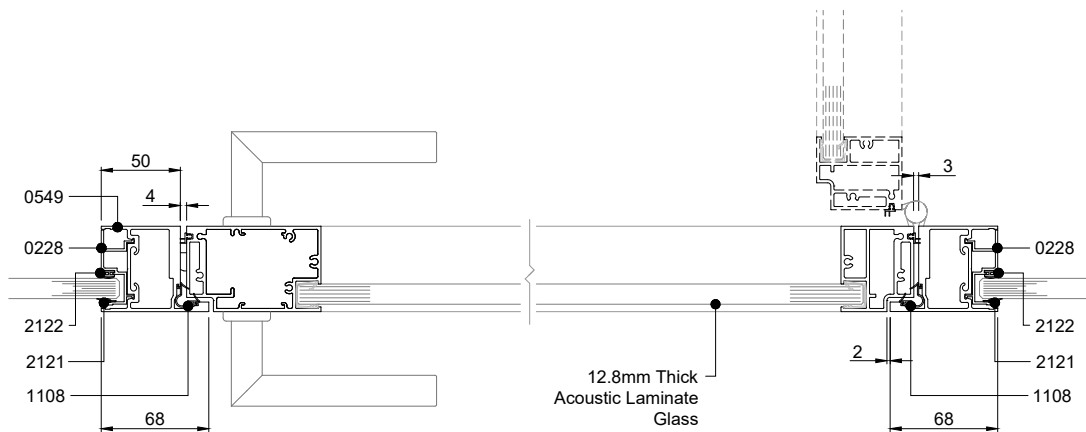
Single glazed abutment to single glazed hinged Edge Unity  
with 68mm wide D455 door jamb

# Revolution 54

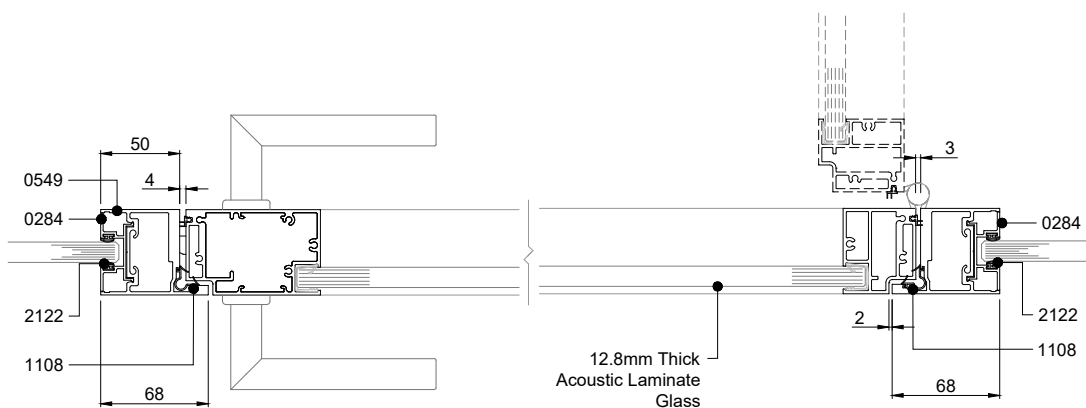
## Door Details: Vertical Sections



Double glazed abutment to double glazed hinged Edge Synergy  
with 68mm wide D455 door jamb



Single glazed abutment to single glazed hinged Edge Synergy  
with 68mm wide D455 door jamb

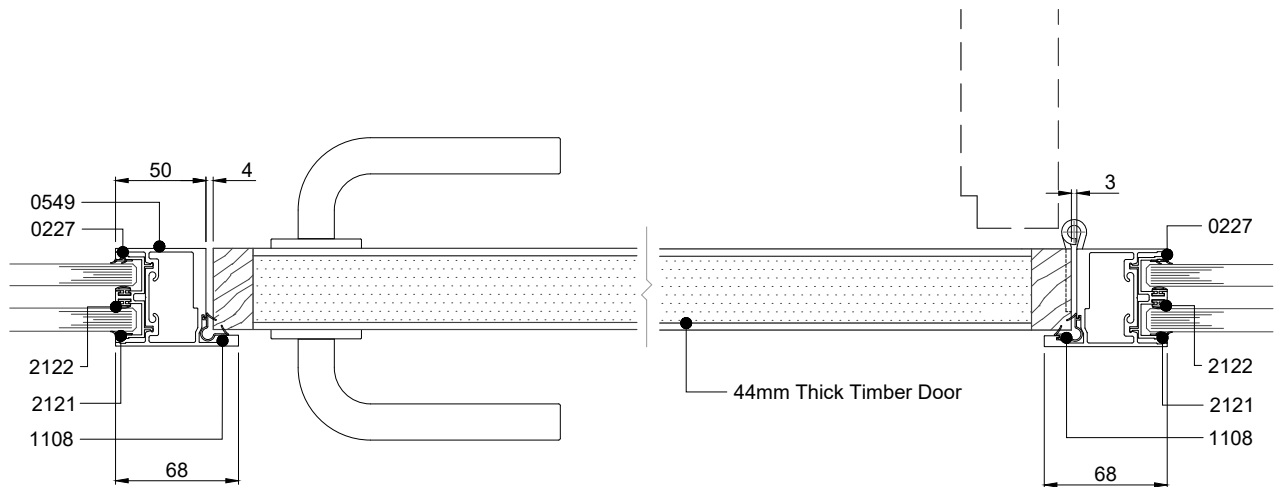


Single glazed abutment to single glazed hinged Edge Synergy  
with 68mm wide D455 door jamb

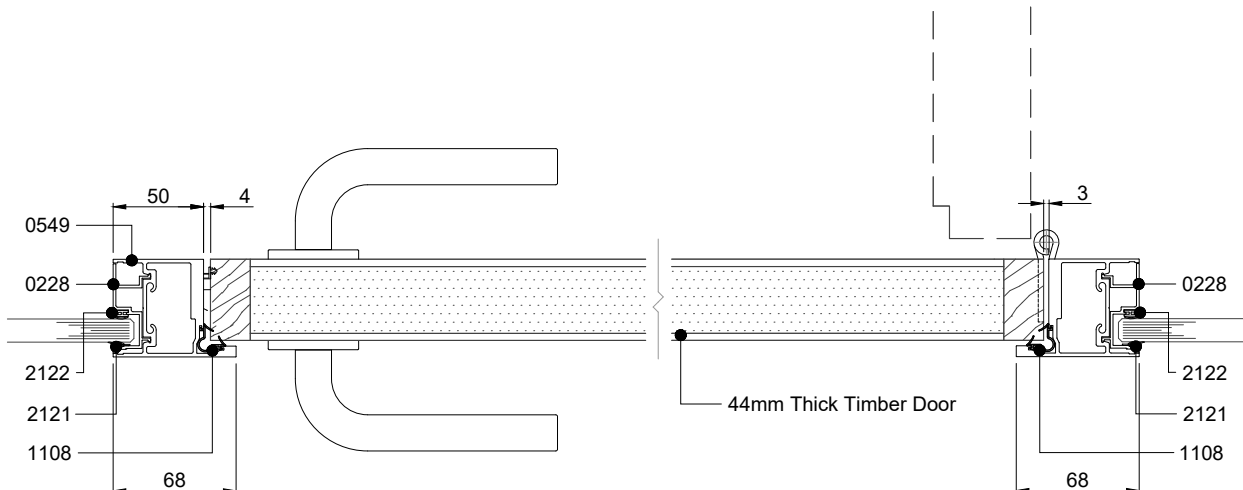


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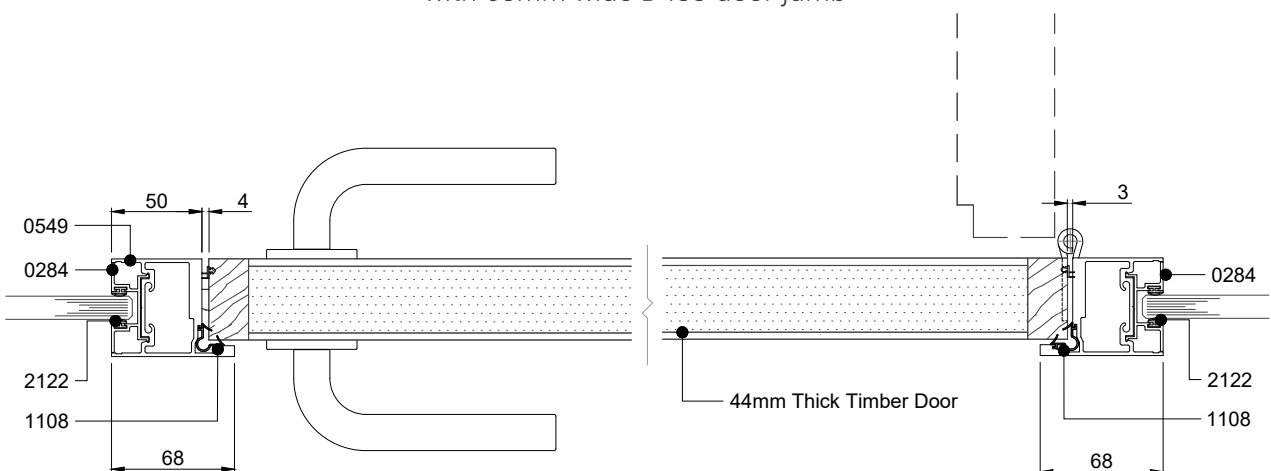
## Door Details: Vertical Sections



Double glazed abutment to hinged 44mm timber door  
with 68mm wide D455 door jamb



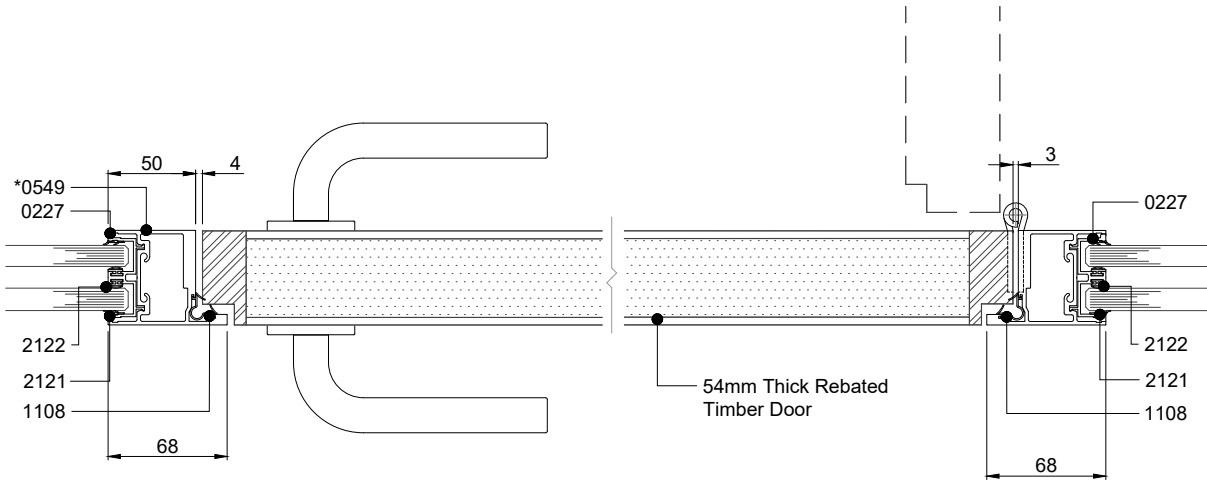
Single glazed abutment to hinged 44mm timber door  
with 68mm wide D455 door jamb



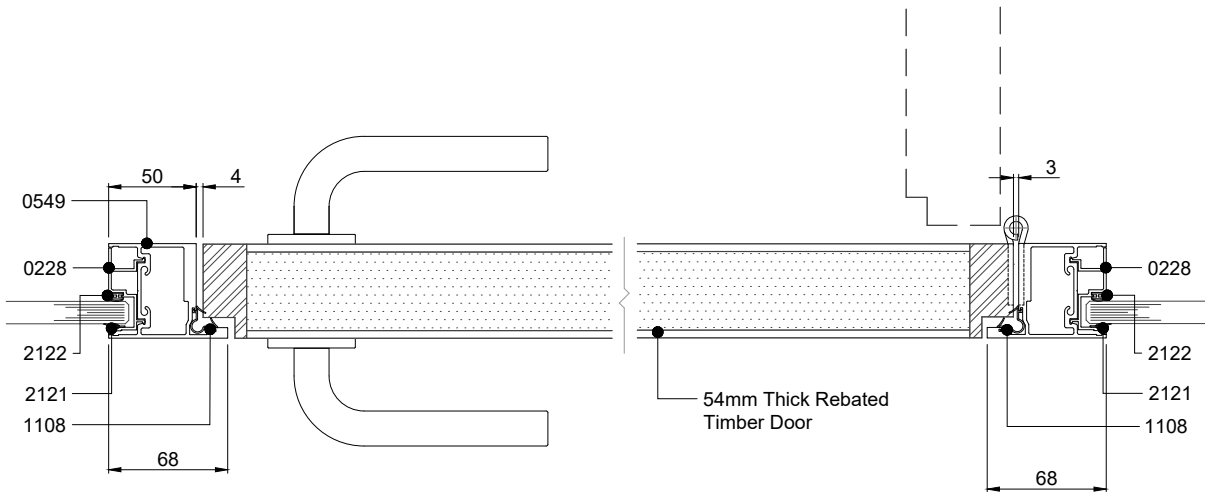
Single glazed abutment to hinged 44mm timber door  
with 68mm wide D455 door jamb

# Revolution 54

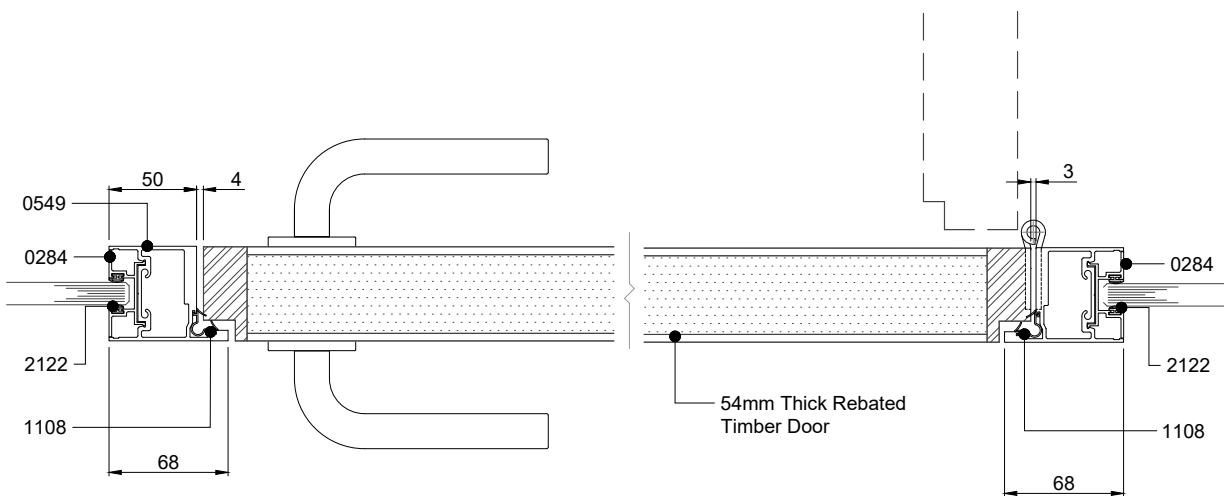
## Door Details: Vertical Sections



Double glazed abutment to hinged 54mm rebated timber door  
with 68mm wide D455 door jamb



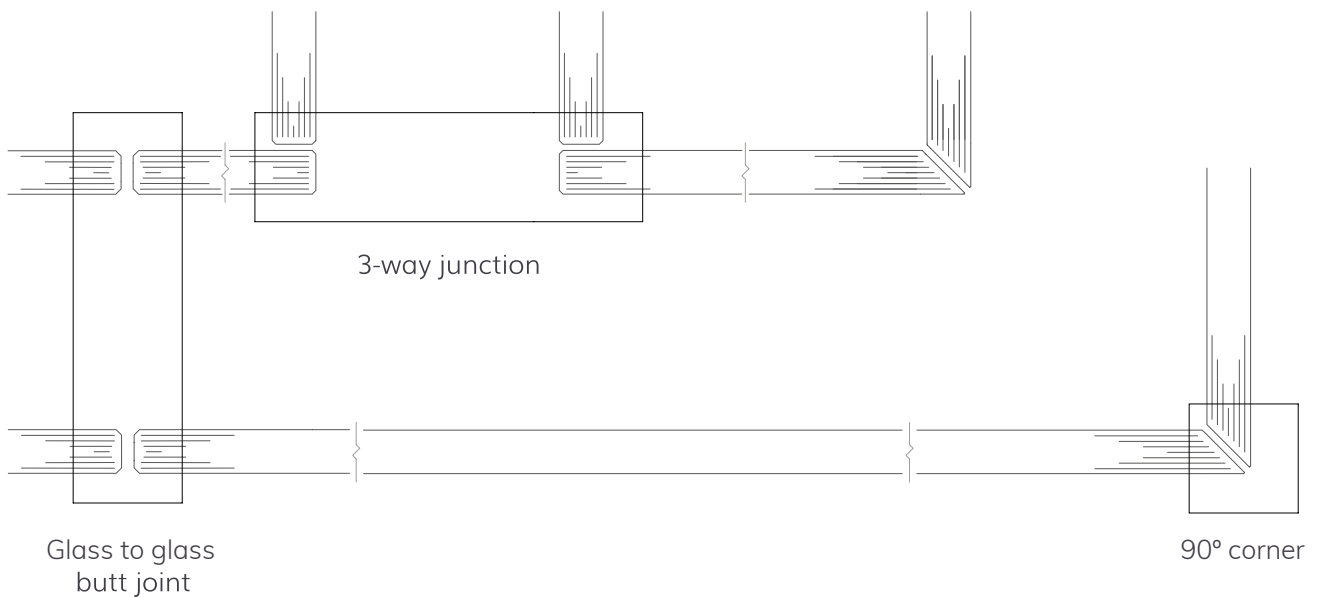
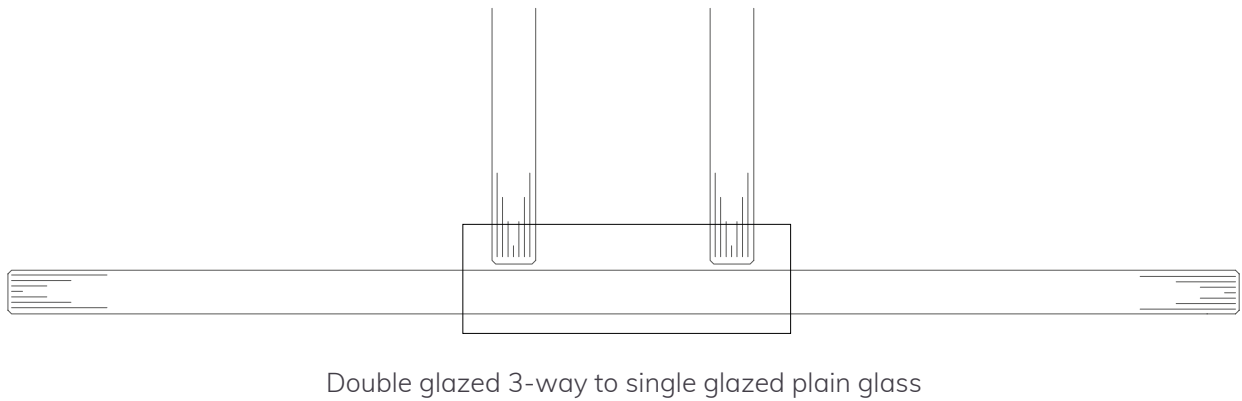
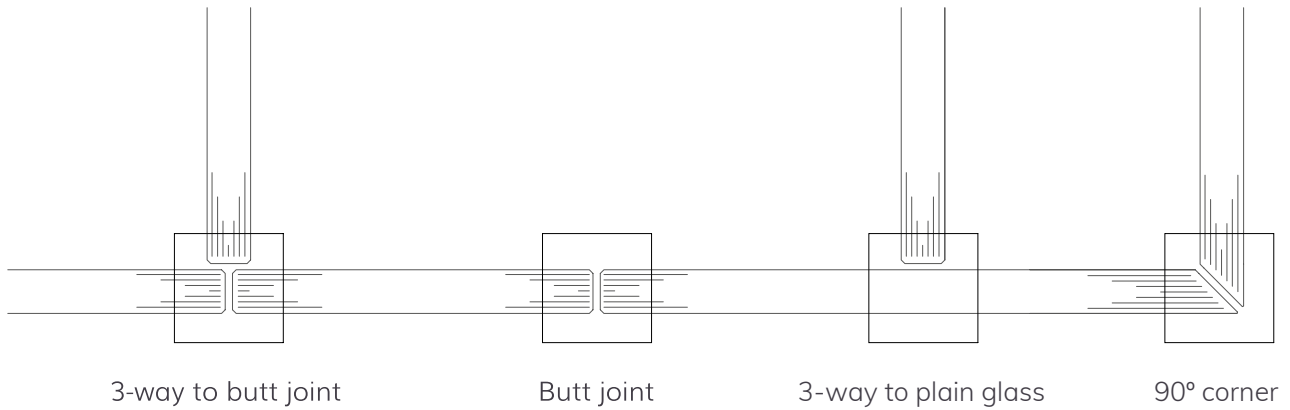
Single glazed abutment to hinged 54mm rebated timber door  
with 68mm wide D455 door jamb



Single glazed abutment to hinged 54mm rebated timber door  
with 68mm wide D455 door jamb

# Revolution 54

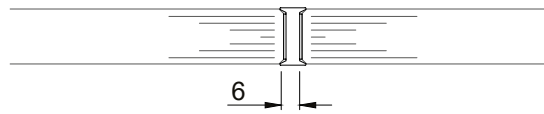
## Glass Details: Vertical Sections





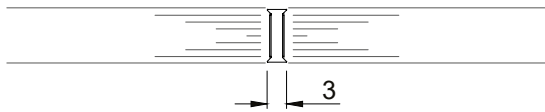
# Revolution 54

## Abutment Details: Horizontal Sections Generic Drywall



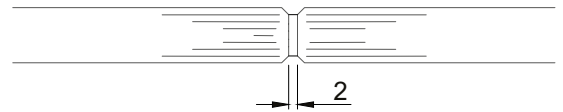
0060 - 12mm & 12.8mm glass

Glass to glass aluminium dry joint



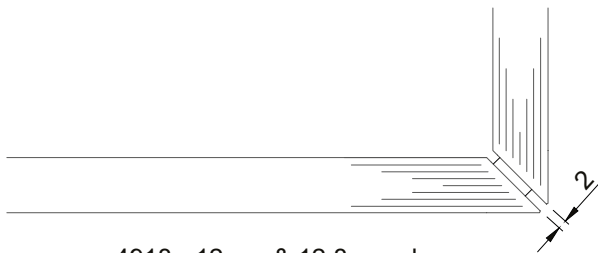
1201 - 12mm glass    1281 - 12.8mm glass

Glass to glass Ghost dry joint



4918 - 12mm & 12.8mm glass

Taped dry joint



4918 - 12mm & 12.8mm glass

90° mitre taped corner dry joint



0075 - 12mm & 12.8mm glass

90° corner aluminium dry joint



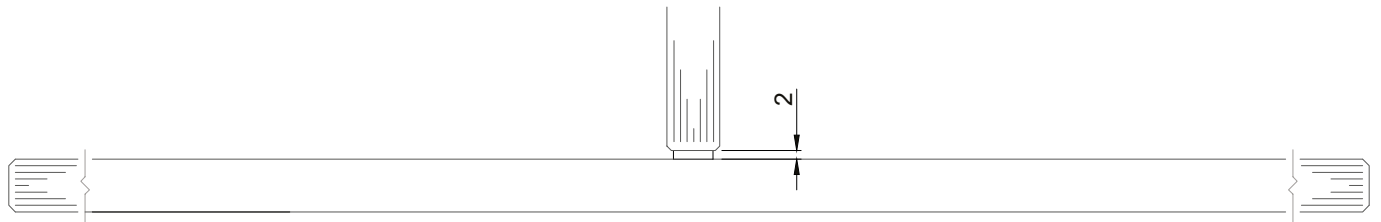
4918 - 12mm & 12.8mm glass

90° taped corner dry joint

# Revolution 54

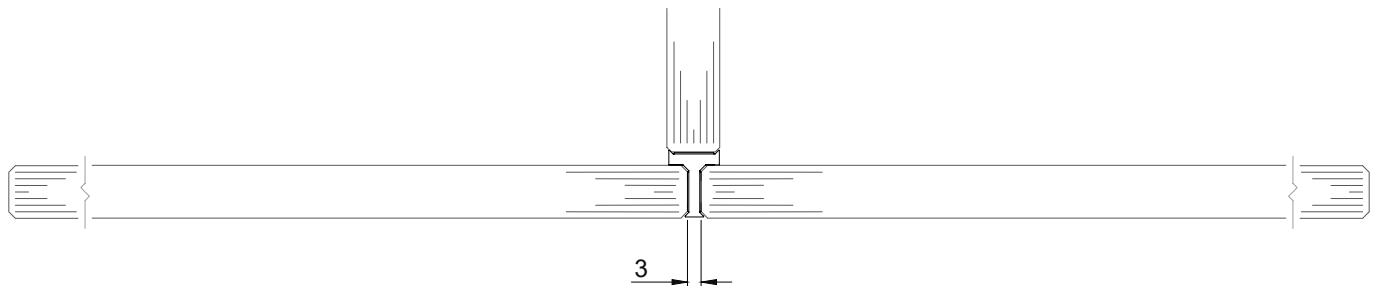
## Glass Details: Vertical Sections

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4918 - 12mm & 12.8mm glass

Taped 3-way to plain glass



1204 - 12mm glass  
1284 - 12.8mm glass

Ghost 3-way joint

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# Specification

## Live Load Deflection

With the increasing trend towards the use of lightweight building materials, Optima recognises the need to cater for the resulting inevitable live load deflection of both structural slabs and perimeter curtain walling.

The Optima Revolution 54 partition system has the capacity to accommodate the following levels of asynchronous live load deflection:

Vertical Deflection: **±25mm** and **±40mm** as standard

Lateral Deflection: **±10mm** as standard, **±25mm** to special order

## Stiffness

Standards:      **BS 5234 – Parts 1 & 2**  
                      **BS 6399 – Part 1**

All Optima glazed partition systems are designed to withstand the nominal crowd loadings that may be present in a typical office fit-out where there is no change in level greater than 380mm between one side of the partition and the other.

The recognised standard for the design and installation of partitions is BS 5234. However, since this standard was published, the nature of partition design has evolved to the extent that the standard no longer accurately represents the product on the market.

Part 2 of BS 5234 requires a series of tests to demonstrate strength and robustness with the results defined as a 'Duty Rating'. Unlike the partition types covered in the scope of BS 5234, modern 'frameless' glazed partitions are formed predominantly of glass and the testing regime cannot be reasonably applied.

Instead, Optima uses the known physical and structural characteristics of glass and specifies appropriate partition glass based on calculation and with reference to BS 6399 – Part 1. This standard suggests design loads that may act on the surface of a partition in a range of environments. However, neither BS 6399, nor any other UK standard stipulates the maximum degree of acceptable deflection under the design loads.

Every project is different and Optima considers each on its own merits and calculates the type and thickness of glass accordingly. Without a guiding standard the degree of acceptable deflection is extremely subjective. The Optima recommended criteria for maximum deflection are L/120 or 25mm, whichever is the lesser value. This is in line with the International Building Code, a US standard widely applied in many overseas regions, particularly the Middle East. These criteria will ensure a high degree of stiffness in the partition glass.

A more relaxed set of criteria are commonly applied in the UK. These state that the maximum acceptable deflection should be L/65 or 50mm, whichever is the lesser value. This would result in a more flexible partition. Therefore it is important to ensure that the safe stress limit of the glass is taken into account when specifying type and thickness. This is particularly important when considering glazed partitions for projects and locations where there is less incentive for the occupants to exercise care such as Public Sector buildings, particularly schools and hospitals.

Optima will consider both sets of deflection criteria when recommending glass on a project by project basis and in consultation with designers and specifiers. For further information and advice on glass specification, please contact the Optima Technical Sales Team.

## Maximum Height

Taking the above stiffness criteria into account, the Optima Revolution 54 system is available as follows:

Maximum Ceiling Height (12/12.8mm glass):    **3000mm** as standard.

Greater ceiling heights may be accommodated subject to special order and correct glass selection – see below.

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# Specification

## Glass Selection

It is important to select glass appropriate to the situation into which it is being installed. All glass used in Optima glazed systems is class A safety glass as defined in BS6206. However, there are a number of glass types that fall into this category, some more appropriate than others in certain scenarios, and these are explained below.

### Annealed Glass

#### Unprocessed float glass

Annealed glass in its basic, unprocessed form is not categorised as a safety glass and is therefore not suitable for use in partition systems or glass doors.

#### Toughened Glass

##### Standard: BS EN 12150

This is annealed glass that has been thermally treated to give it much greater impact resistance: typically seven times greater. Toughened glass satisfies BS6206 in that it breaks safely, shattering into equally sized 'dice'. Toughened glass is the only glass recommended for use where drilling or clamping is required, for example, when used for accommodating door furniture.

It is important to note that the toughening process stimulates Nickel Sulphide (NiS), known as 'inclusions', which occurs naturally in float glass. The presence of these inclusions can, over time, although very rare, induce a spontaneous fracture of a toughened glass panel. While all glass processors take all practicable steps to supply inclusion-free glass, it is not possible to guarantee their absence. .

In order to ensure complete customer confidence in the safety of a glass, Optima recommends the use of **Heat Soaked Toughened Glass** for doors and **Laminate Glass** for Partitions. See below for more details.

#### Heat Soaked Toughened Glass

##### Standard: BS EN 14179

To significantly reduce the risk of NiS induced spontaneous failure, toughened glass panels can be subjected to an additional process known as Heat Soak Testing. Although not providing a 100% guarantee, this process is used to

reveal the presence of NiS inclusions. It is a destructive test, designed to break any panel that is at risk.

### Laminate Glass

##### Standard: BS EN ISO 12543

Laminate glass is produced by bonding two layers of annealed glass either side of a PolyVinyl Butyral (PVB) Interlayer. In order to be categorised as a class A safety glass the PVB interlayer must be not less than 0.76mm thick and safe breakage is achieved by the interlayer holding the fractured panel together.

### Acoustic Laminate Glass

##### Standard: BS EN ISO 12543

Acoustic laminate glass is produced in the same way as the regular laminate described above. However, it utilises a specially formulated acoustic PVB interlayer to achieve significantly better acoustic properties.

### Toughened Laminate Glass

##### Standards: BS EN 12150 (Toughened) and BS EN 12543 (Laminate)

This type of glass combines the benefits of both toughened and laminate glass and would typically involve a 1.5mm PVB interlayer. Because it has the additional benefit of lamination, the glass would not normally require the additional process of heat soaking. Toughened laminate glass should typically be specified for glass screens adjacent to a significant change in level (e.g., an atrium) and where there is the potential for significant crowd loading as defined in BS 6180 and BS 6399.

The Optima Technical Sales Team will be happy to assist in the specification of the appropriate glass for your particular project requirements.

# Specification

## Acoustic Performance

All Optima systems are subjected to sound insulation tests in accordance with BS EN ISO 10140-1:2010 and BS EN ISO 10140-2:2010 at UKAS accredited laboratories. These are optimised tests of the system only and not aggregate values for screen and door. The result is expressed as an Rw value.

The Optima Revolution 54 partition system has achieved the following UKAS accredited acoustic values for the stated construct:

33dB (Rw)	Test Ref: 33-133	12mm Toughened Glass in single glazed multi-module screen
36dB (Rw)	Assessed <sup>(1)</sup>	12.8mm Laminated Glass in single glazed multi-module screen
38dB (Rw)	Test Ref: 33-159	12mm Acoustic Laminate Glass in single glazed multi-module screen
38dB (Rw)	Assessed <sup>(1)</sup>	2 x 12mm Toughened Glass in double glazed multi-module screen
39dB (Rw)	Assessed <sup>(1)</sup>	12mm Toughened Glass + 12.8mm Laminated Glass in double glazed multi-module screen
40dB (Rw)	Assessed <sup>(1)</sup>	2 x 12.8mm Laminated Glass in double glazed multi-module screen
41dB (Rw)	Test Ref: 33-142	12mm Toughened Glass + 12.8mm Acoustic Laminate Glass in double glazed multi-module screen
42dB (Rw)	Test Ref: 33-152	12.8mm Laminate Glass + 12.8mm Acoustic Laminate Glass in double glazed multi-module screen
44dB (Rw)	Test Ref: 33-160	12.8mm Acoustic Laminate Glass + 12.8mm Acoustic Laminate Glass in multi-module screen with recessed drywall abutments
45dB (Rw)	Test Ref: AC09/308/01	12.8mm Acoustic Laminate Glass + 12.8mm Acoustic Laminate Glass in enhanced double glazed multi-module screen with recessed drywall abutments
46dB (Rw)	Test Ref: 33-162	12.8mm Acoustic Laminate Glass + 12.8mm Acoustic Laminate Glass in double glazed single-module screen with recessed drywall abutment
(1) Independently assessed against UKAS accredited test data..		

Acoustic data for combinations with 10/10.8mm glass and aggregated values for screens with door sets is available on request.

It should be noted that in an on-site acoustic test, a partition may demonstrate a 3dB to 8dB lesser performance than under laboratory conditions, depending on the partition type. This can be further affected by ambient noise levels on the receiving side of the test sample and by poorly insulated abutments offering a 'flanking' path for audible sound.

For further information on potential aggregate values for screens with doors, or values for alternative glass types, consult the Optima Technical Sales Team.



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# Specification

## CDM Regulations

In the absence of any specific legislation, Optima recommends that designers adopt the following industry-typical design considerations:

### Panel Size

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- Can the panel be transported to site, loaded out to the workface and installed?
- Is there a suitable access route, particularly if the glass is not located on the ground floor?
- Is it still possible to replace the panel after the building is in service?

### Panel Weight

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- Can the panel be installed manually? Optima generally consider one man should not be expected to lift more than 25kg for a prolonged duration. However, every lift would have to be properly assessed for risk according to the prevailing circumstances.  
As a guide, the weight of glass should be calculated by 2.5kg x thickness (mm) x area (sq.m).
- If mechanical means to install would be necessary, can this be achieved if the panel needs to be replaced during the lifespan of the building?

### Breakage

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- What would be the consequence of a panel failure?
- Is the panel in a safety critical location? (e.g. an atrium barrier)
- Should a fail safe condition be built into the design?
- Is there risk to building occupants as a result of the breakage?
- Can the panel be replaced safely?

### Maintenance

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- Can the installation be maintained safely and without undue risk?
- Is there a mechanism to protect the maintenance staff, such as safety harness anchorage points?

Every project will throw up its own unique challenges. The Optima Technical Sales Team should be consulted at the earliest opportunity, if there is any doubt that a scheme can be built and maintained safely.

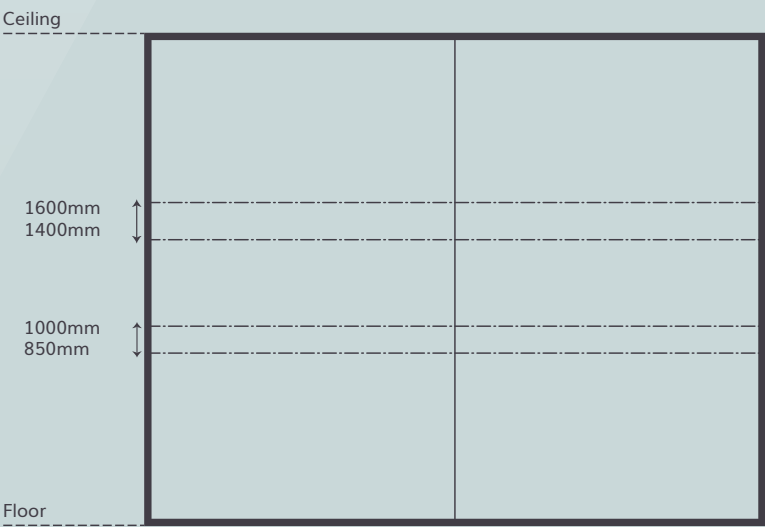
# Specification

## Building Regulations Approved Document K (2013)

### Glass Entrance Doors and Glazed Screens

- The location of glass entrance doors should be easily distinguished, especially when they are within a glazed screen and when the door is both open and shut.
- Manifestation should be clearly contrasting with the background in all weather/lighting conditions.
- Manifestation should be located between 850mm–1000mm and 1400mm–1600mm i.e. in 150mm high bands which could be a solid band, a decorative feature or split bands of 50mm each.
- High contrast strips at the top and on both sides of a glazed door in a glazed screen should be provided.
- If glass doors can remain in the open position, the leading edge should be clearly distinguished and protected by guarding (entrance doors only) to prevent it becoming a collision hazard.

Please refer to Door Sets Designer's Guide for information regarding minimum clear openings in relation to Part M.



150mm min **Optima** Manifestation must contrast visually with the background seen through the glass in both natural and artificial light conditions.

50mm min  OR  OR 

# Optima

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