

**Client:** Jolong Window and Door Systems Pty Ltd  
13-15 David St, Dandenong, Vic 3175, Australia

**Measurement Type: Airborne Sound Insulation**

AS 1191-2002 "Acoustics – Method for laboratory measurement of airborne sound insulation of building elements"  
AS/NZS ISO 717.1:2004 "Acoustics - Rating of sound insulation in buildings and of building elements - Airborne sound insulation"

**Test Specimen** [Specimen area<sup>4</sup>: 1.80 m (w) x 2.10 m (h) = 3.79 m<sup>2</sup>]

**Designation:** Jolong 70 Series alu.thermal break inward opening hinged door;  
double glazed, 6/12Ar/6.

**Description<sup>1</sup>:**

- As per client drawing 'Jolong Acoustic Testing(Detail drawing).pdf', page 7.
- Hinged door (opening to internal side of test specimen), alongside fixed unit.
- Framing: proprietary aluminium extrusions.
- Glazing: double glazed system, 6 mm clear toughened / 12 mm Argon / 6 mm clear toughened.
- Mechanical components: door wheels, handle, triple-point lock etc as per Jolong specifications.
- Sealing: as per drawing, rubber glazing wedges sealing glazing units in sashes, sashes sealed to frame with linear sealing components fitted into extrusion profiles and/or adhered as per design, and overall frame sealed within test aperture of laboratory using wet caulking. Dry sealing was supplemented with wet caulking where necessary, but not in places where the operability of the door would have been affected.

See following page for client drawing.

**Installation<sup>5</sup>:**

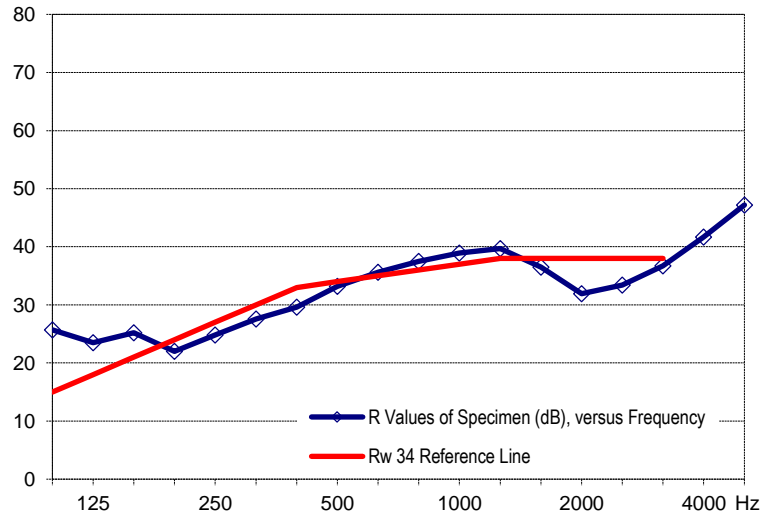
- A filler wall<sup>3</sup> was built to create a reduced size test aperture in the laboratory for the test specimen.
- The test specimen frame was manufactured with ≈ 5 mm of installation clearance, placed in the test aperture, positioned with glazing packers as required, screw-fixed and then caulked around the perimeter both sides.
- The test specimen was positioned in the portion of the aperture contained within the 200 m<sup>3</sup> reverberation chamber, with a minimal indent from the face of the filler wall.
- The door and fixed sash units, already with their glazing fitted, were installed in the outer frame.
- The door was operated ten times by laboratory staff after installation and immediately prior to acoustic testing.
- The door was tested with the triple-point locking mechanism engaged.



Test specimen installed in laboratory for testing

**Measurement Details & Results**

Freq (Hz)	Specimen R Value <sup>2</sup> (dB)		95 % Conf δ (dB)
	1/3 Octave	Whole Octave	
100	25.7		1.2
125	23.5	24.7	2.2
160	25.2		0.6
200	22.0		1.1
250	24.8	24.2	0.9
315	27.6		0.8
400	29.6		0.8
500	33.2	32.1	0.6
630	35.6		0.4
800	37.5		0.2
1000	38.9	38.6	0.2
1250	39.7		0.2
1600	36.5		0.1
2000	31.9	33.5	0.2
2500	33.4		0.2
3150	36.7		0.3
4000	41.7	40.0	0.4
5000	47.2		0.4



**Performance Index Numbers**

R<sub>w</sub> (C; C<sub>tr</sub>) = 34 (-1; -3) dB  
STC = 35

**Confidence Intervals (AS 1191, App B, 95 % Confidence)**

Measurement was carried out in both directions through the test specimen, using 3 loudspeaker positions in each chamber; giving 6 spatially independent sets of R values, from which average R values and confidence intervals have been calculated (confidence intervals rounded up to 1 decimal place).

**Measurement Conditions**

Date of measurement: 21 September 2018  
200 m<sup>3</sup> chamber (north): 15 °C, 57 % R.H.  
100 m<sup>3</sup> chamber (south): 14 °C, 64 % R.H.  
Atmospheric pressure: 1014 mBar

**Notes, Deviations etc**

- Physical characteristics of materials may be suppliers' nominal figures; not necessarily verified by CSIRO.
- ≥ indicates R values, if any, where measurability was limited by proximity to background level.
- The filler wall constructed to create the test aperture to suit the specimen, was of discontinuous timber frame construction, clad with 2 layers of 16 mm thick fire rated plasterboard, with high density glass wool in the cavity. R<sub>w</sub> 75 has previously been measured for a similar wall.

- Specimen area used in calculations was the full area of the aperture in the filler wall, 1802 x 2102 mm (w x h).
- The filler wall was built by contractors engaged by the laboratory; the test specimen was installed by the client.

**Issuing Authority**

Signed:   
Date: 4 December 2018

**Instrumentation**

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2  
Microphones/preamps: • GRAS type 40AP microphones on B&K type 2669 preamps, rotating simultaneously in both rooms with 33 sec period (1.32 m radius in 200 m<sup>3</sup> room, 1.32 m radius in 100 m<sup>3</sup> room).  
Noise source: • 2 x Norsonic NOR276 dodecahedron loudspeakers (one speaker in each test chamber) driven by a Norsonic NOR280 power amplifier  
Calibration: • Brüel & Kjær type 4231 acoustic calibrator: Jul 2018 (NATA cal)  
• Analyser: Jul 2018 (NATA cal)

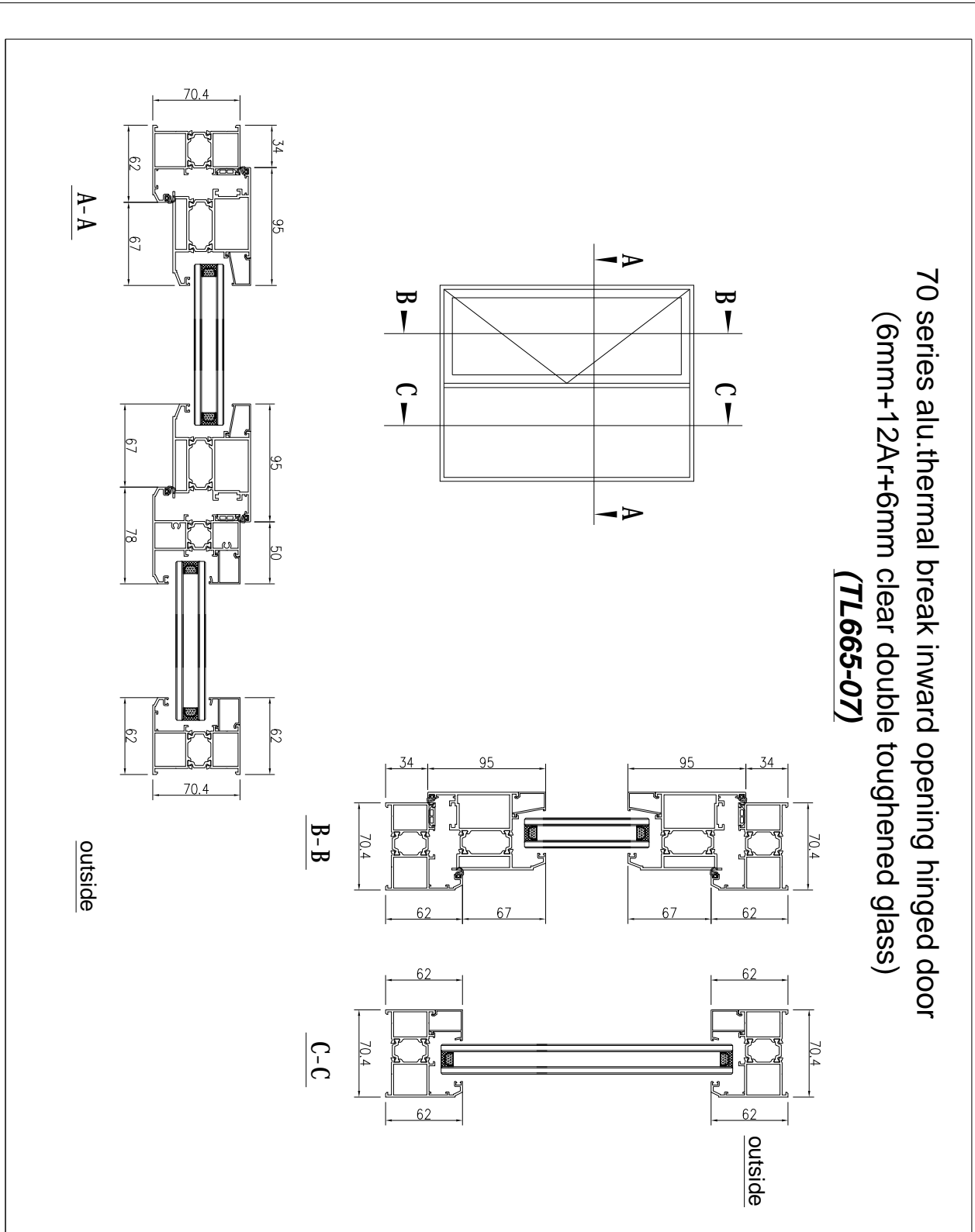
**Laboratory Construction**

Chambers: • 300 mm thick concrete • rectangular prism with dimensional proportions 1:1.3:1.6 for spectral distribution and overlap of room modes • northern room approx. 200 m<sup>3</sup> vol (212 m<sup>2</sup> area); southern room 100 m<sup>3</sup> vol (133 m<sup>2</sup> area).  
Diffusers: • 200 m<sup>3</sup> room: 20 diffusers (approx 40 m<sup>2</sup>) • 100 m<sup>3</sup> room: none.  
Isolation: • ≥ R<sub>w</sub> 78; structurally separate (60 mm air gap), vibration isolated (11 Hz).  
Specimen • 3.60 m wide x 3.00 m high, each chamber having 25 mm thick steel plate aperture: lining its 300 mm deep portion of the test aperture, creating a total aperture depth of 660 mm, resilient foam sealing the 60 mm air gap.

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**Additional Test Specimen Details** (from drawing provided by client)



**JOLONG · 蛟龙®**  
Qingdao Jolong  
window door &  
curtain wall  
systems Co., Ltd.

Client Name :  
Jolong Acoustic Testing

Drawing:  
outside view

Design No. :  
Pic No. :  
Scale :  
Date : 2018-11-03  
page 07 total 07

Designer :  
Audit :  
Approve :  
Tel : 0532-89068018

Accepted/Signature: