

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 area⁴: 1.80 m (w) x 1.20 m (h) = 2.17 m²]

Designation: Jolong 70 Series alu.thermal break hand cranking awning window system;
double glazed, 5/12Ar/5, with scissor-action winder and twin side cam latches

Description¹:

- As per client drawing 'Jolong Acoustic Testing(Detail drawing).pdf', page 4.
- Awning window (full width single sash), operable with scissor-action winder and twin side-cam latches.
- Framing: proprietary aluminium extrusions.
- Glazing: double glazed system, 5 mm clear toughened / 12 mm Argon / 5 mm clear toughened.
- Mechanical components: stays, cams and scissor-action winder mechanism 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 as per design, and overall frame sealed within test aperture of laboratory using expanding foam and wet caulking.

See following page for client drawing.

Installation⁵:

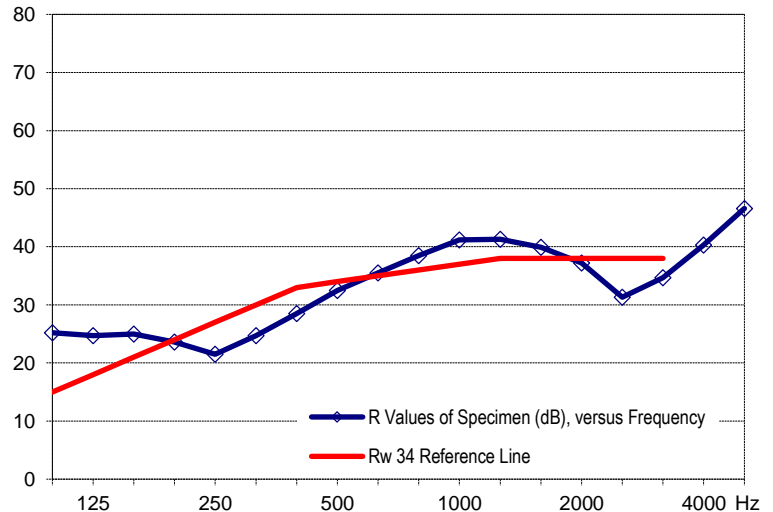
- A filler wall³ was built to create a reduced size test aperture in the laboratory for the test specimen.
- The test specimen frame was manufactured with ≈ 5 mm of installation clearance, placed in the test aperture, positioned with glazing packers as required, screw-fixed and sealed with expanding foam and caulking compound.
- The test specimen was positioned in the portion of the aperture contained within the 200 m³ reverberation chamber, with a minimal indent from the face of the filler wall.
- Sashes and glazing units were placed in the frame and installation completed.
- The window was operated ten times by laboratory staff after installation and immediately prior to acoustic testing.
- The door was tested with both of the side-cam latches engaged and the operable chain winding mechanism fully closed.



Test specimen installed in laboratory for testing

Measurement Details & Results

Freq (Hz)	Specimen R Value ² (dB)		95 % Conf δ (dB)
	1/3 Octave	Whole Octave	
100	25.2		0.9
125	24.7	24.9	1.8
160	25.0		1.3
200	23.6		0.7
250	21.5	23.1	1.2
315	24.7		0.6
400	28.5		0.7
500	32.5	31.2	0.4
630	35.5		0.4
800	38.5		0.4
1000	41.2	40.1	0.2
1250	41.3		0.1
1600	39.9		0.3
2000	37.2	34.6	0.1
2500	31.3		0.1
3150	34.7		0.2
4000	40.3	38.2	0.5
5000	46.6		0.4



Performance Index Numbers

R_w (C; C_{tr}) = 34 (-1; -3) dB
STC = 34

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 m³ chamber (north): 14 °C, 58 % R.H.
100 m³ chamber (south): 13 °C, 64 % R.H.
Atmospheric pressure: 1015 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_w 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 1203 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 m³ room, 1.32 m radius in 100 m³ 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 m³ vol (212 m² area); southern room 100 m³ vol (133 m² area).
Diffusers: • 200 m³ room: 20 diffusers (approx 40 m²) • 100 m³ room: none.
Isolation: • ≥ R_w 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)

