

**Client:** Ontera – Milliken (Australia) Pty Ltd  
171 Briens Road, Northmead, NSW 2152

**Measurement Type: Sound Absorption**

AS ISO 354–2006 “Acoustics–Measurement of sound absorption in a reverberation room”  
AS ISO 11654–2002 (ISO 11654:1997) “Acoustics–Rating of sound absorption–Materials and systems”

**Test Specimen** [Specimen area: 3.5 x 3.0 m (10.5 m<sup>2</sup>)]

**Designation:** Milliken ‘WellBAC Comfort Plus’ carpet tile (planks)

**Description:**

- Carpet tiles (planks), 1000 mm long by 250 mm wide by approx 9 mm thick.
- Loop pile face (678 g/m<sup>2</sup> face weight) on PU foam with a nonwoven backing layer.
- Overall weight approx. 3.6 kg/m<sup>2</sup>.
- Test specimen planks included several different colours from the range, of identical manufacture except as relating to their appearance.

**Installation:**

- The floor of the laboratory was swept and vacuumed to remove dust.
- 42 planks were arranged in a rectangle 3.5 x 3.0 m on the concrete floor of the reverberation room, and pushed together to avoid gaps between adjacent tiles.
- The perimeter edge of the rectangular array of specimen tiles was covered with a skirt of 1 mm thick steel angles.
- Specimen installation was carried out by laboratory staff.



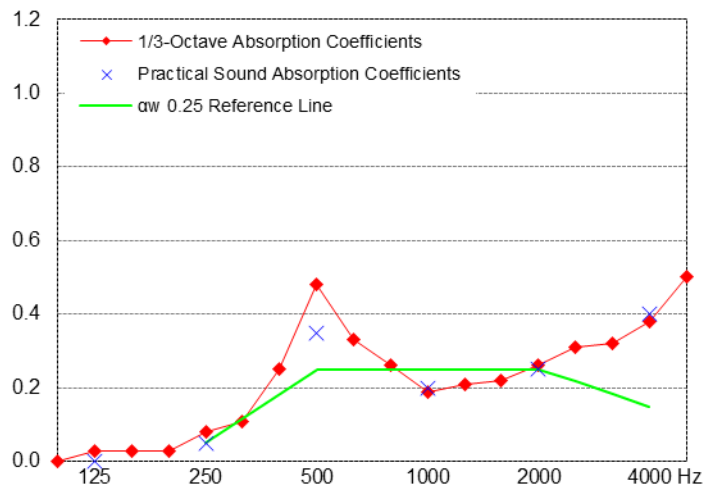
Test specimen as tested



View showing face and backing of carpet tile

**Measurement Details & Results**

Freq Hz	Absorption coefficient		Reverberation times, T <sub>60</sub> (sec)	
	α <sub>s</sub>	α <sub>p</sub>	Empty room	with Specimen
100	0.00		5.31	5.32
125	0.03	0.00	6.34	6.01
160	0.03		6.98	6.50
200	0.03		7.12	6.63
250	0.08	0.05	6.33	5.46
315	0.11		6.26	5.09
400	0.25		6.33	4.16
500	0.48	0.35	5.74	3.03
630	0.33		5.81	3.57
800	0.26		5.33	3.68
1000	0.19	0.20	5.07	3.85
1250	0.21		4.49	3.45
1600	0.22		4.05	3.13
2000	0.26	0.25	3.55	2.74
2500	0.31		3.08	2.34
3150	0.32		2.61	2.05
4000	0.38	0.40	2.09	1.66
5000	0.50		1.65	1.30



**Performance Indices<sup>2,3</sup>**

α<sub>w</sub> = 0.25 (H)  
SAA = 0.23  
NRC = 0.25

**Measurement Conditions**

	Empty room	with Test Specimen
Date of measurement:	19 Dec 2016	19 Dec 2016
Temperature & humidity:	22 °C, 34 % R.H.	22 °C, 33 % R.H.
Atmospheric pressure:	997 mBar	997 mBar

**Notes, Deviations etc**

- The required 12 spatially independent decay curves came from ensemble averaging 10 successive decays with each of 3 different source loudspeaker positions, all sampled by 4 fixed microphones, using linear averaging.
- Shape indicators (L, M, and H), if any, accompanying the α<sub>w</sub> index, signify absorption coefficients (α<sub>p</sub>) exceeding the α<sub>w</sub> reference value by 0.25 or more in the Low, Medium or High frequency ranges respectively.
- SAA and NRC are defined in ASTM C423; laboratory requirements for which differ from AS ISO 354.
- Physical characteristics of materials may be as per client or supplier's advice; not necessarily verified by CSIRO.
- The laboratory elected to install the test specimen parallel with the walls of the room.
- This report describes the same test as the earlier report AC204-03-1, the product now being identified by the trade designation given above.

**Issuing Authority**

Signed:   
Date: 25 November 2019

**Instrumentation**

Real time analyser: • Brüel & Kjær PULSE LAN-XI type 3160-A-4/2  
Microphones/preamps: • 2 x GRAS 40AP & 2 x Brüel & Kjær 4134 microphones, all on Brüel & Kjær 2669 preamps, positioned in the room as per AS ISO 354  
Noise source: • Rola 12UX on flat 1m<sup>2</sup> baffle (up to 1.8 KHz)  
• Brüel & Kjær type HP 1000 dodecahedron (from 1.8 KHz)  
Calibration: • Brüel & Kjær type 4228 Pistonphone: Feb 2016 (NATA cal)  
• Analyser: Feb 2016 (NATA cal)

**Laboratory Construction**

Reverb room: • 300 mm thick concrete (closed off from the adjoining room by a plasterboard faced composite wall) • parallelepiped with dimensional proportions 1:1.3:1.6 for distribution of room modes • approx 203 m<sup>3</sup> total room volume • approx 215 m<sup>2</sup> surface area excluding diffusers  
Diffusers: • 20 stationary diffusers, approx. 40 m<sup>2</sup> total surface area  
Absorption area: • in accordance with AS ISO 354 unless noted otherwise