Sounding the Alarm for Employee Satisfaction

Realising Acoustic Comfort in the Modern Day Office

Criterion

Introduction

A happy employee is a productive employee. Unfortunately with today's open 'collaborative' offices, happiness and productivity both suffer.

The office interior of the 21st century bears little resemblance to the offices of days gone by. Private offices and high partitions have given way to open plan design with significantly shorter partitions, and in some cases none at all.

While these spaces help to promote collaboration and communication amongst workers, the benefits can often pale in comparison to the negative effects that are being realised due to poor acoustics.

A 2013 study from the University of Sydney found that a lack of sound privacy was by far the biggest frustration of office workers, with nearly 60 per cent dissatisfied with their current situation. In addition to this, the noise level in the office was a frustration for almost 30 per cent.[1]

In a separate report it was found that office workers are losing 86 minutes a day due to unwanted distractions, and with little capacity to work constructively many employees are feeling unmotivated, unproductive and overly stressed.[2]

With the need to address the serious health and productivity issues caused by noise in the modern day office by reducing the transfer of sound within a building, while still providing open and collaborative spaces, the use of partitions with suitable acoustic performance helps to create noise barriers while still allowing for connectivity and collaboration for those within.

Partitions

Partitions are a versatile solution to controlling the transfer of sound generated within a building, as well as offering a level of privacy. As the recommended noise level of an open office is between 45-50dB, and the common sound level of conversation speech is 65dB, an effective sound barrier is needed for creating quiet areas. It is crucial in the design of partitioned areas that each element will provide the necessary acoustic properties.

> Office workers **lose 86 minutes a day** due to unwanted distractions

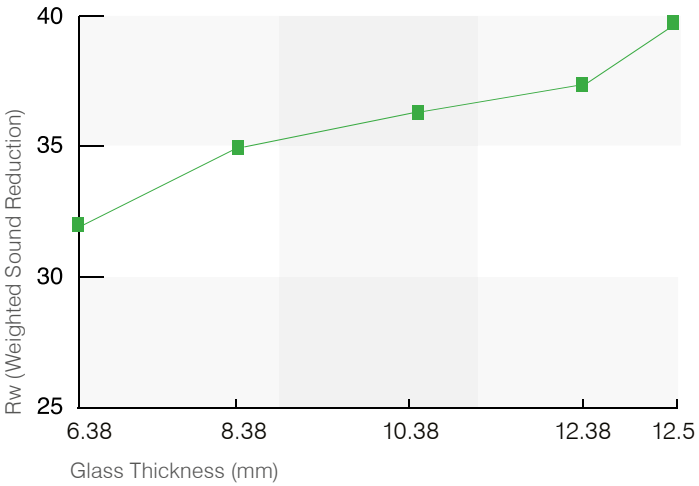
Single Glazed Windows

Glass partitions are an ideal solution for creating light and spacious areas within the working environment that also offer privacy and reduced noise. Today the range of glass commercial partitions includes part plasterboard and part glass walls, framed partitions of glass and frame-less partitions of glass.

In addition to a modern and stylish appearance, glass partitions can provide excellent acoustic qualities when used correctly.

When it comes to glass as a noise reducing device, a general rule is the thicker the glass the greater the sound reduction, (Fig.1[3]) a single pane of 12.5mm acoustic glass able to achieve an Rw rating of 40.

Glass thickness and noise reduction *(Fig.1)*



Double Glazed Windows

With double the glass, double glazing can help to greatly improve the acoustic qualities of a partition system. However, special consideration much be given to the width of the air gap between the two panes of glass.

While an air gap of between 6mm and 18mm is standard for improving thermal performance , a significantly wider gap is necessary to improve acoustic performance.[4]

For the air space in a double glazed window to have an impact on noise reduction, the recommended air gap should be a minimum of 50mm wide[5] for optimal performance.

The different combinations of glass thickness and air gap will determine the Rw rating of the system (Fig.2).

Glass Thickness (mm)	Spacing (mm)	Rw Rating
6.38 + 6.38	62	33
6.38 + 8.38	61	35
6.38 + 10.38	60	36
8.38 + 8.38	60	40
8.38 + 10.38	59	44
10.38 + 10.38	58	44
8.38 + 12.38	60	47
8.5 + 12.5 Acoustic Glass	60	50

(Fig.2)

Plasterboard Walls

The acoustic properties of plasterboard walls will vary dependent on a range of factors. The most basic plasterboard partition will have an Rw rating of approximately 30[6], which will then increase dependent on insulation type, plasterboard thickness and stud size.

With the right combinations of insulation, plasterboard and studs, excellent sound reduction can be achieved, exceeding 50 Rw*.

QUICK TIPS FOR ENHANCING ACOUSTIC RATINGS

There are a range of additional factors that can affect the acoustic performance of an office partition.

- Substitute Fire/Sound Rated Plasterboard in lieu of standard plasterboard
- Ensure use of Light Gauge Studs
- Include Acoustic Blanket (or wall Batts) between plasterboard
- Stagger studs – 92mm Track + 51mm Stud
- Use multiple layers of plasterboard within the partition

Suite	Rw Rating*	Insulation	Plasterboard	Stud
100 x 50mm	42 Rw	Cab 3 Insulation	One layer of acoustic plasterboard each side	64 mm Stud
100 x 50mm	45 Rw	Criterion Acoustic Batt (14kg/m^3)	One layer of acoustic plasterboard each side	64 mm Stud
114 x 50mm	42 Rw	Cab 3 Insulation	One layer of acoustic plasterboard each side	76 mm Stud
114 x 50mm	46 Rw	Criterion Acoustic Batt (14kg/m^3)	One layer of acoustic plasterboard each side	76 mm Stud
131 x 50mm	44 Rw	Cab 4 Insulation	One layer of acoustic plasterboard each side	92 mm Stud
131 x 50mm	46 Rw	Criterion Acoustic Batt (14kg/m^3)	One layer of acoustic plasterboard each side	92 mm Stud
131 x 50mm	48 Rw	Cab 4 Insulation	One layer of acoustic plasterboard each side	Staggered Stud
131 x 50mm	51 Rw	Criterion Acoustic Batt (14kg/m^3)	One layer of acoustic plasterboard each side	Staggered Stud
131 x 50mm	50 Rw	Criterion Acoustic Batt (14 kg/m3)	Double Layer of Standard Plasterboard each side	64 mm Stud
131 x 50mm	55 Rw	Criterion Acoustic Batt (14 kg/m3)	Double Layer of Acoustic Plasterboard each side	64 mm Stud
131 x 50mm	50	Criterion Acoustic Batt (14 kg/m3)	Double Layer of Standard Plasterboard each side	64mm Stud
131 x 50mm	55	Criterion Acoustic Batt (14 kg/m3)	Double Layer of Acoustic Plasterboard each side	64mm Stud

Flanking is one of the biggest concerns for doors when achieving increased noise reduction

Glazed Doors

As with glass partitions, the glazing and composition of the glass used for the door will impact the noise reduction level, and the same considerations must be made.

Flanking is one of the biggest concerns for doors when achieving increased noise reduction.

In order to reduce flanking, we recommend;

Frame: The door frame must be well sealed between the frame and supporting wall to prevent sound from flanking around the frame. Perimeter door seals are critical to reducing flanking via door frames.

Acoustic seals: Glazed doors should have acoustic seals around the head, jamb and foot to reduce flanking. Acoustic seals will only provide suitable performance if they are properly fitted, with rubber seals more effective than brush type seals in sealing gaps around the perimeter of the door.[7]

Criterion Industries

Criterion Industries provide innovative aluminium partitioning for customisable office design. The Criterion aluminium partitioning systems have been designed to provide maximum flexibility, empowering architects, builders and contractors to revolutionise tomorrow's workspace.

The Criterion aluminium partitioning suites are recognised throughout Australia for flexibility, quality and value, with partitioning systems for any office application, with a wide range of stylish and versatile glass partitions, plasterboard partitions and partition door packages with different glazing options.

Terminology

Flanking – *Flanking sound transmission is the sound that passes around, over the top or under the primary partition separating two spaces*

dB – *The unit used to measure the intensity of a sound*

Rw – *A number used to rate the effectiveness of a soundproofing system or material. Increasing the Rw by one translates to a reduction of approximately 1db in noise level. The higher the Rw number, the better a sound insulator it will be.*

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