

## SOUND INSULATION FOR AIR CONDITIONERS AND OTHER EXTERNAL MECHANICAL PLANT

Excessive noise from the operation of machines and external mechanical plant can disturb neighbours, disrupt sleep, interfere with normal daily activities and significantly impact on people's health.

Residential machines refer to equipment such as domestic air conditioning units, lawnmowers, power tools, swimming pool pumps and filters, and mechanical plant refers to equipment such as commercial air conditioning units, ventilation and refrigeration systems.

The acoustic terminology used in this fact sheet is explained in *Fact Sheet 11: Acoustic Terminology*.

### Noise from Residential Machines

The operation of domestic air conditioning units has the potential to create noise related complaints on adjoining residential properties.

### Installing and Maintaining Air Conditioning Units

The correct design, installation and maintenance of air conditioning units will help reduce the noise impact on neighbouring properties and can offer improved efficiency, performance and value for money.

The right type of air conditioner for your residence depends on a number of factors such as the design and size of your residence, whether you have ceiling insulation and how you want to use your system. Architectural features such as the orientation of the house, ceiling height, roof shape and the size and style of windows can all also affect the type of system required.



Air conditioners on roofs are considered to be part of the building fabric. Air conditioners that are visible from the street are unlikely to be acceptable in such situations, particularly in heritage-listed buildings or Conservation Zones.

As a guide, if you are looking to cool or warm more than two rooms, you may need to consider a ducted system or a multi-head split system. If you are looking for a one or two room solution, a split system may be appropriate.

Ultimately, every residence and situation is different and should be assessed on an individual basis. The type of air conditioner selected and its placement within your residence is critical to ensure peak performance and to minimise noise.

### Energy Efficiency

From October 2004 it has been mandatory that all domestic air conditioners for sale in Australia carry an approved energy label. Australian Standard 3823 regulates the performance of household air conditioners.

It is best to select an air conditioner with a higher star rating. Tests conducted by the Australian Consumers' Association show that energy efficient models aren't always more expensive than those with higher energy consumption. Even if you do pay a bit more upfront for a model with more stars, its lower running costs will compensate the initial outlay.

### Maximum Allowable Noise Levels

Noise emissions from the operation of residential machines are regulated by the *Environment Protection (Machine Noise) Regulations 1994*. The maximum permissible noise levels for different operating machines are shown in the table below.

Specified Times	Maximum Permitted Noise Level, dB(A)	Class of Machines
8 pm on any night (except Saturday night) until 8 am on the following morning 8 pm on Saturday night until 9 am on the following Sunday morning	45	Lawnmowers, power tools (such as saws, drills etc.), compressors, pumps, swimming pool pumps and filters.
10 pm on any night (except Saturday night) until 8 am on the following morning 10 pm on Saturday night until 9 am on the following Sunday Morning	45	Domestic air conditioning units

If you are experiencing excessive noise from the operation of any residential machines (as listed in the above table) you can raise the problem with your neighbour or contact the City of Adelaide to investigate.

See the South Australian Environment Protection Agency (EPA) website ([www.epa.sa.gov.au/noise.html](http://www.epa.sa.gov.au/noise.html)) for more information.



### How to Reduce Noise Emissions

1. Try to locate any fixed machines (such as air conditioning units) as far away as possible from neighbours' windows and outdoor areas. The noise level at a receptor will decrease as the distance to the noise source decreases.
2. Do not locate air conditioning units in a corner which is open to a neighbouring residence as reflections off surfaces can cause noise to be amplified.
3. Consider buying premium quality machines designed for quiet operation. It is often cheaper to replace noisy equipment rather than applying noise mitigating treatments to existing equipment (especially for air conditioning units).
4. Acoustic screens or barriers installed around noisy equipment will reduce the noise impact on others. \*Note: a screen must not restrict airflow around the air conditioning unit as this can affect the system's efficiency, the minimum distance required around a unit for sufficient airflow can often be determined through the manufacturer.
5. Installation of air conditioning systems should be undertaken by a suitably qualified technician as air flow efficiency helps reduce noise impacts.
6. Ensure that air conditioners are well fastened to the façade / roof as poor attachment can result in an increase in the noise level. Where vibration of the unit results in an increased noise level, isolation springs or feet can be used to reduce vibration.
7. Make sure any noisy equipment is regularly serviced to ensure all fixtures and fittings are safe, secure and do not rattle or vibrate excessively.

### Noise from Commercial Mechanical Plant

Noise from the operation of commercial mechanical plant (such as air conditioners, ventilation and refrigeration systems) is regulated by the *Environment Protection (Industrial Noise) Regulations 1994*. These maximum permissible noise levels at a noise sensitive receptor (such as a residence) are reflected in the Adelaide (City) Development Plan. As such, mechanical plant within new developments within City of Adelaide have to be designed, sited and screened to ensure that the maximum permissible noise levels within the policy are met. The maximum noise levels are shown in the table below.

City of Adelaide Zone	Maximum Noise Level dB(A)	
	Daytime 7 am to 10 pm	Night time 10 pm to 7 am
In or adjacent to a Residential Zone, the North Adelaide Historic (Conservation) Zone or the Park Lands Zone	50	40
In or adjacent all other zones	55	45

\*Note: the maximum noise levels as specified in the above table are subject to penalties to compensate for any 'annoying' characteristics of the noise and for planning purposes.

If you are experiencing excessive noise from a commercial air conditioner, contact management of the premises to advise them of the problem. If the business does not respond, contact Council's Environmental Health Service.

# NOISE TECHNICAL FACT SHEET

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See the South Australian Environment Protection Agency (EPA) website ([www.epa.sa.gov.au/noise.html](http://www.epa.sa.gov.au/noise.html)) for more information.



Courtesy City of Melbourne

\*Note: Reducing air conditioner noise can be a costly and lengthy process. If you are moving to a new property and think existing air conditioning noise may be a problem, raise the issue with the property owner or body corporate before making a decision to purchase or rent.

## Acoustic Consultant

If you are considering any sound insulation, it is recommended that you verify any sound insulation specifications with your architect/builder and/or employ the services of an acoustic consultant to ensure the proposed changes provide significant noise reduction.

To contact an acoustic consultant visit the Yellow Pages Directory (under Acoustical Consultants) or for an acoustic consultant who is part of the Association of Australian Acoustical Consultants (AAAC) visit [www.aaac.org.au](http://www.aaac.org.au)

### Other Fact Sheets

A number of other Noise Technical Fact Sheets complement the information in this document. These can be downloaded from the City of Adelaide website: [www.cityofadelaide.com.au/noise](http://www.cityofadelaide.com.au/noise)

*Fact Sheet 1: Sound Insulation Guidelines*

*Fact Sheet 2: Gaps and Flanking Paths*

*Fact Sheet 3: Sound Insulation for Windows*

*Fact Sheet 4: Sound Insulation for Glazed Doors and Standard Doors*

*Fact Sheet 5: Sound Insulation for Exterior Walls and Facade Systems*

*Fact Sheet 6: Ventilation*

*Fact Sheet 7: Sound Insulation for Air Conditioners and Other External Mechanical Plant*

*Fact Sheet 8: Sounds in the City*

*Fact Sheet 9: Adelaide City Road Traffic Noise Map*

*Fact Sheet 10: Noise Ready Reckoner*

*Fact Sheet 11: Acoustic Terminology*

*Fact Sheet 12: Frequently Asked Questions*

*Fact Sheet 13: Sound Insulation for Internal/Common Walls*

*Fact Sheet 14: Sound Insulation of Floors*

*Fact Sheet 15: Mechanical Plant for Commercial Buildings*

*Fact Sheet 16: AAAC Star Rating*



## The Building Code of Australia Compliance

The Building Code of Australia (BCA) should be consulted to ensure that any sound insulation upgrades comply with the requirements of the BCA. It should be noted that although the upgrade of a building element may be acoustically beneficial, it may not comply with the requirements of the BCA.

## Australian Building Codes Board

The Noise Technical Fact Sheets contain content sourced from the Building Code of Australia and Guidelines on Sound Insulation, published by the Australian Building Codes Board (ABCB). These documents can be purchased from the ABCB website: [www.abcb.gov.au](http://www.abcb.gov.au)

## Standards

The standards which apply in the Development Plan are:

- Australian/New Zealand Standard 2107:2000 “Acoustics - Recommended design sound levels and reverberation times for building interiors”
- World Health Organisation, Guidelines For Community Noise, Edited by B Berglund et al, 1999) (<http://www.who.int/docstore/peh/noise/guidelines2.html>)
- Recognised liquor licensing noise limits ([www.olgc.sa.gov.au](http://www.olgc.sa.gov.au)). These are modified to apply within bedroom and living areas.

## Contacts / Additional Information

Additional information can be obtained from:

- Australian Association of Acoustic Consultants ([www.aaac.org.au](http://www.aaac.org.au))
- Australian Acoustical Society ([www.acoustics.asn.au](http://www.acoustics.asn.au))
- Office of the Liquor and Gambling Commissioner ([www.olgc.sa.gov.au](http://www.olgc.sa.gov.au))
- South Australian EPA ([www.epa.sa.gov.au/noise.html](http://www.epa.sa.gov.au/noise.html))
- South Australian Police ([www.sapolice.sa.gov.au](http://www.sapolice.sa.gov.au))
- Yellow Pages ([www.yellowpages.com.au](http://www.yellowpages.com.au) search “acoustic”)
- Australian Window Association ([www.awa.org.au](http://www.awa.org.au))

## Acknowledgements

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The Fact Sheet contains content sourced directly from the City of Melbourne's City Sounds 2 Noise Fact Sheets, which can be viewed at [www.melbourne.vic.gov.au/noise](http://www.melbourne.vic.gov.au/noise) and copyright in this material remains the property of the City of Melbourne. City of Adelaide gratefully acknowledges the assistance of the City of Melbourne in the use of this material in the preparation of the Fact Sheets.

## Contact Us

For further information call City of Adelaide on (08) 8203 7203 or email [city@cityofadelaide.com.au](mailto:city@cityofadelaide.com.au)

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