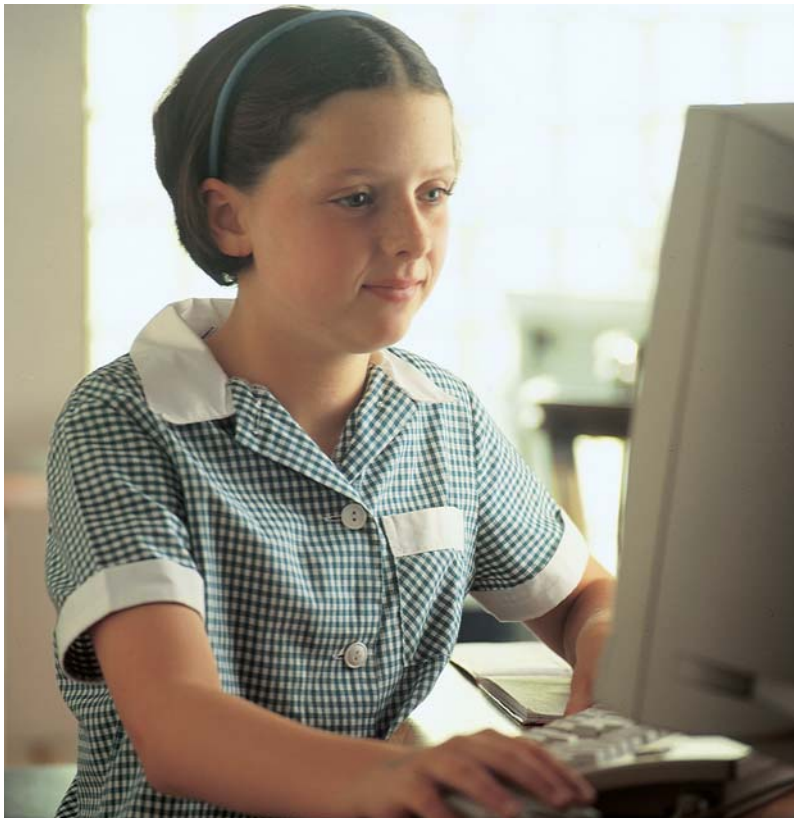




CEILING SYSTEMS

[Between us, ideas become reality.™]

School Zone™



School Zone Ceiling System

Create more effective facilities for learning and teaching.

**Your guide to one of the most cost effective components of school design—
An Armstrong Ceiling System.**



Create more effective spaces for learning and teaching

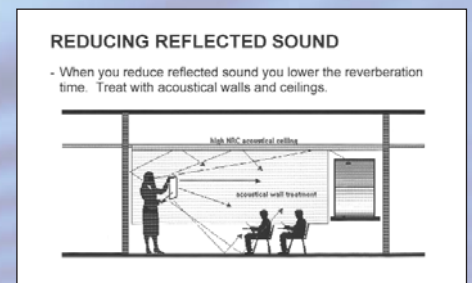
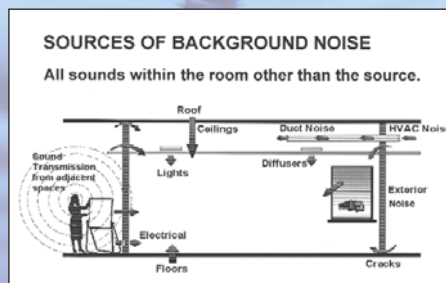
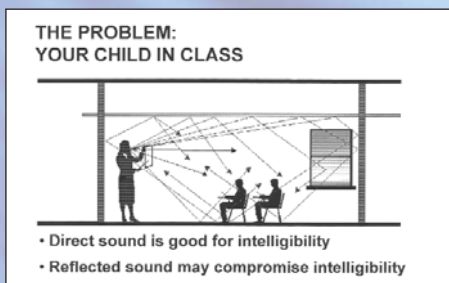
The Ideal General Purpose Classroom

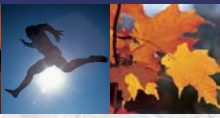
The facts:

- Studies show (1995 General Accounting Office USA) that acoustics for noise control is a national problem in schools and that conditions affecting speech intelligibility are often unsatisfactory. If students cannot hear words clearly, their concentration is affected.
- Both the reverberation time and background noise level will determine the amount of speech that can be heard - referred to as speech intelligibility.
- Good speech intelligibility is required in classrooms at all grade levels since the primary mode of teaching involves speech and listening.
- High levels of background noise can mask speech sounds reducing speech intelligibility.
- Sound levels of normal speech is around 45-55dB(A). If background noise is near these levels, intelligibility is impacted.
- It is said "noise creates noise". The more background noise is generated, the greater the level of noise the occupants make to be heard.
- In Australia, the cost of acoustic ceilings, those ceilings that absorb sound, is generally less than the commonly used sound reflective flush plasterboard ceilings.
- Armstrong Ceilings can substantially improve classroom acoustical design.

What is the ideal outcome in General purpose classrooms?

- According to AS2107-1987 the ideal outcome measured as "reverberation time" is 0.4-0.7 seconds. (Reverberation time is the time it takes for sound to reduce by 60dB or "die out".)
- Armstrong recommends the optimum reverberation time to be 0.5 seconds. This gives ideal speech intelligibility in a typical classroom. This is achieved by using absorptive materials that reduce reflection within rooms and therefore lower reverberation times. This must be balanced with stopping noise from transferring room to room. The two key criteria are NRC and CAC (defined below).
- A ceiling that absorbs 70% of the sound that strikes it and stops 40dB from transferring room to room provides the - NRC (Noise Reduction Coefficient) of 0.70 and a CAC (Ceiling Attenuation Class) of 40.
 - NRC - Noise Reduction Coefficient
 - Measures sound absorption of a product and is an average of 250, 500, 1000, 2000hz.
 - CAC - Ceiling Attenuation Class
 - Measures how many decibals are stopped by the ceiling from going over partition walls into the adjacent room.















Create more effective spaces for learning and teaching





Acoustic Ceiling Selection Guide

| Product | Acoustics | | Dimensions | Edge Profile | Installed Cost | |
|---------------------------------|-----------|-----|------------|--|----------------|---|
| | NRC | CAC | | | | |
| RH99 Fine Fissured | 0.55 | 35 | 1200x600mm | Square  | \$ |  |
| Dune Max (Sabbia) | 0.65 | 35 | 1200x600mm | Square  | \$\$ |  |
| RH99 Fine Fissured High NRC/CAC | 0.70 | 40 | 1200x600mm | Square  | \$\$ |  |
| RH99 Ultima | 0.70 | 35 | 1200x600mm | Square  | \$\$\$ |  |
| RH99 Optima | 0.90 | - | 1200x600mm | Square  | \$\$\$ |  |
| Flush Plasterboard | 0.05 | 39* | | | \$\$\$\$ | |

Note: This is a selection of ceiling options only. Contact Armstrong for full range details.
* Based on 13mm thick plaster

30-Year System Performance Guarantee
Against Visible Sag
HumiGuard® Plus
Against Mold/Mildew & Bacterial Growth
BioBlock™ Plus



- For cost comparison reasons, all ceiling tiles are square edge lay in (flat). Tegular  edges extra.
- NRC: Noise Reduction Coefficient (amount of sound absorbed by the ceiling).
- CAC: Ceiling Attenuation Class (the amount of sound that is prevented from passing through the ceiling).
- Flush plasterboard has a low NRC (non sound absorptive) and is generally a higher cost ceiling option.
- Use Optima with high NRC 0.90 in “open plan” areas with full height walls where CAC is not required.



Fine Fissured and Dune are GOOD ENVIRONMENTAL CHOICE Certified Products. Other products are under review. Licence No. ARM2007 Standard: GECA 28-2005 – Furniture and Fittings



Armstrong Fine Fissured and Dune ceiling systems have been independently assessed by ecospecifier, and deemed to be of an eco-preferable nature. Additionally, these products are likely to contribute to the achievement of various Green Star credit points.

Other ways to control sound

Within spaces:

- Use sound absorbent acoustic “Soundsoak” wall panels, to reduce reverberation.

Between spaces:

- Stagger the location of electrical outlets between rooms. This ensures no direct sound leakage paths.
- Use plenum barriers when walls do not run through the plenum to the roof to improve CAC performance or lay acoustic batts over the back of the ceiling 1200mm either side of partitions.
- Caulk all wall perimeters at ceiling, floor and corners to nullify any sound leakage paths.
- Use gasketing or seals at all doors and windows.

Further benefits of using an Armstrong Acoustic Ceiling

- Australia’s primary source of acoustical ceiling systems
- Ease of access to services above ceiling – all tiles removable
- Damaged tiles can be simply replaced – no patching/repairing required
- Non combustible, conforming to BCA – Spec. C1.10 and tested to AS/NZS 3837:1998 – Group 1
- Light reflectance up to 90%
- “BioBlock” anti mould and mildew treatment on the face and back
- Anti sag (RH99 “Humiguard Plus” performance – tiles withstand 99% humidity in 0-49 degrees C)
- 30 Year warranty when ceilings are installed on an Armstrong PeakForm grid system
- Lightweight – an Armstrong ceiling only weighs around 4kg/m² (including grid)
- Environmentally friendly – ceiling tiles contain up to 79% recycled materials.

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Armstrong's Acoustical Expertise

- School Zone Acoustic Demo Disc
- A range of acoustical wall panels
- Large selection of solutions
- Technical advice

NSW

Armstrong World industries Pty. Ltd.
99 Derby Street,
Silverwater NSW 2128
Telephone (02) 9748 1588
Facsimile (02) 9748 8449

SA

Up-Side Building Systems
376 Cormack Road,
Wingfield SA 5013
Telephone 1300UPSIDE
Facsimile (08) 8349 5956

VIC/TAS

Armstrong World industries Pty. Ltd.
29-39 Mills Road,
Braeside VIC 3195
Telephone (03) 9580 9633
Facsimile (03) 9587 5139

WA

Ceiling Manufacturers of Australia Pty. Ltd.
5 Irvine Street,
Bayswater WA 6053
Telephone (08) 9271 0777
Facsimile (08) 9272 2801

QLD/NT

Armstrong World industries Pty. Ltd.
6 Barrinia Street,
Slacks Creek QLD 4127
Telephone (07) 3809 5565
Facsimile (07) 3809 5507



Armstrong is also Australia's only manufacturer of resilient (PVC) flooring. For more information on these product options please call Commercial on **1800 632 624**

Commercial Flooring – Resilient (vinyl) sheet and tile primarily made locally plus vinyl accessories form a package for health education and mercantile markets.

Residential Flooring – Resilient (vinyl) sheet for domestic and light commercial use, including do-it-yourself.

Wood Flooring – Commercial and domestic grade wood and laminate flooring suitable for both commercial and domestic markets.

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