



**AUTEXO** 

REDEFINING INNOVATION AND SUSTAINABILITY  
IN CLASSROOM ACOUSTICS

# GREAT ACOUSTICS COMPLEMENT GREAT LEARNING ENVIRONMENTS

Numerous local and world-wide studies suggest classrooms are greatly affected by acoustic quality. Here, we look at acoustic effects on learning environments and how to absorb unwanted noise.

The design of a classroom needs to take into consideration the effect acoustics can play on the learning environment, as competing background noise can cause students to misinterpret key words, phrases and concepts.

A study conducted in United States Classrooms reported that the speech intelligibility rating is 75 per cent. This means, on average, every 4th word in the classroom is misheard [1]. Background noise – in particular irrelevant speech – interferes with children’s ability to hear their teachers or one another, therefore affecting their ability to learn.

Many teaching spaces in older schools were not designed for the current teaching methods and are often found to have poor acoustic qualities. The traditional approach was for a teacher to stand at the front of the class whereas today, teachers prefer to move around. This involves working with groups or individuals and requires their voices to be heard from all parts of the room.

Evaluating the acoustic suitability of your classrooms is the first important step to ensure that unsatisfactory acoustics do not adversely affect learning in your school. The Ministry of Education strongly recommends that you:

- Make an assessment or, if in doubt, have one carried out by an acoustics specialist
- Remedy any shortcomings highlighted by the assessment

The signal-to-noise ratio is the ratio of the teacher’s voice to the ambient noise. The recommended minimum necessary for students to hear efficiently in a classroom is +12 to +15 dB (+20 dB is preferred when there are students with hearing impairments). For example, if the background noise level is 55 dB, the teacher would need to speak at 70 dB, which is almost shouting. The louder the background noise, the louder the teacher must speak so the students can hear clearly.

[1] Seep, Benjamin., Glosemeyer, Robin., Hulce, Emily., Linn, Matt. Aytar, Pamela. Classroom Acoustics – A Resource for Creating Learning Environments with Desirable Learning Conditions, August 2000.



# ABSORBING UNWANTED NOISE

Most materials have some sound absorbing qualities; the sound that is not absorbed is reflected. In buildings, the sound-absorbing characteristic of a material is rated as the Noise Reduction Coefficient (NRC) and is measured at voice frequency. If the reverberation time of a room is too long it can be reduced by adding other materials.

The Ministry of Education and the Acoustical Society of America suggest achieving the best acoustics for learning by installing inlay acoustic ceiling tiles and a suitable acoustic wallcovering.

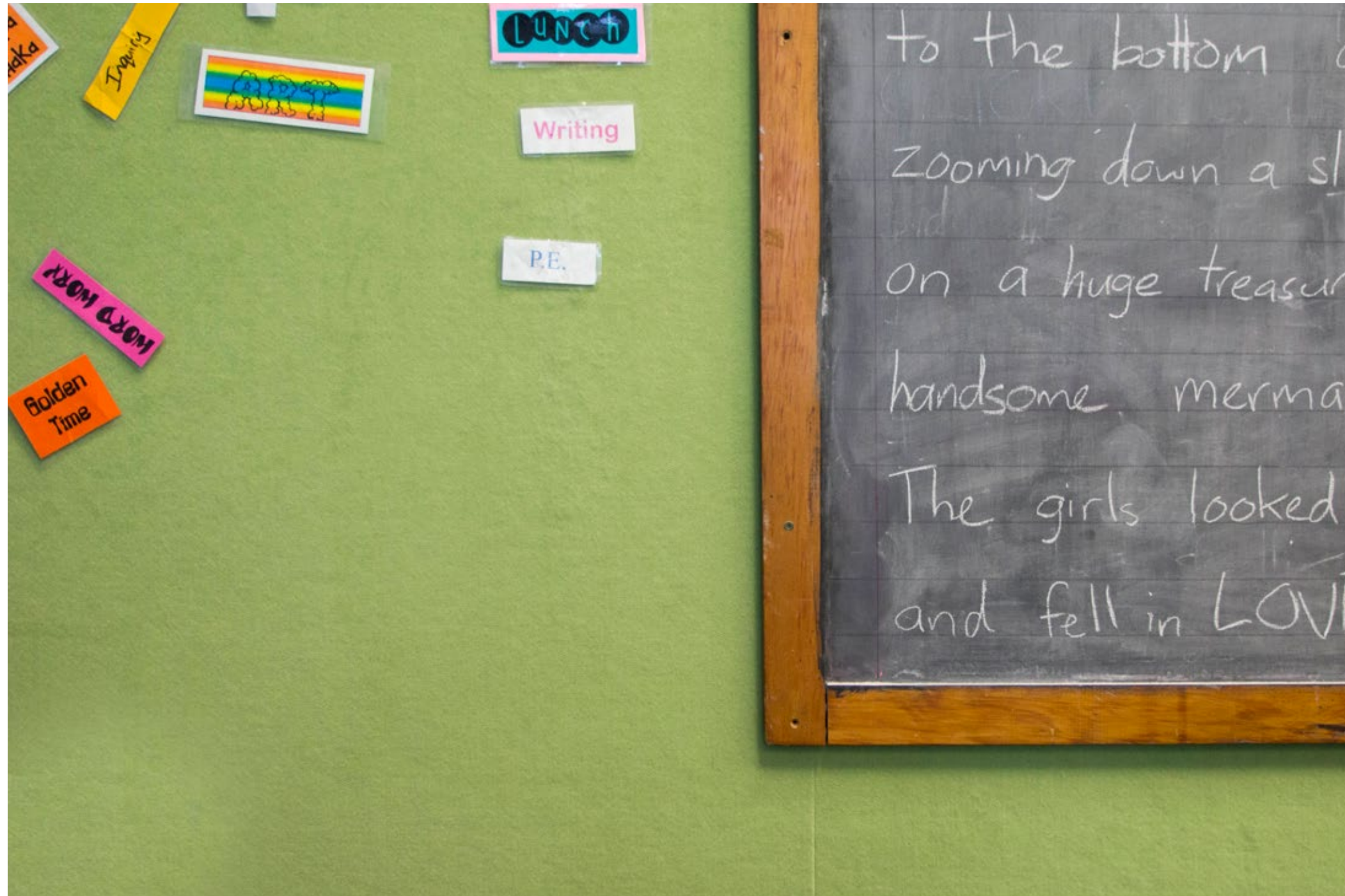
Autex Industries understand that all classrooms and educational areas are different and require unique solutions to provide the optimum level of noise reduction.

With over 40 years’ experience in the education sector, Autex Acoustics have continued to strive for innovation in interior acoustics by continuously improving the performance of their 100 per cent polyester and environmentally-friendly products. A non-toxic alternative to mineral and fibreglass products; Autex’s premier interior acoustic solutions are safe, clean and eco-friendly options for the education industry.

Because teacher’s voices best travel in spaces that are acoustically well designed, it is recommended that schools follow the appropriate stages set out in the Ministry’s Property Management Handbook. It is also best that they ensure their architect or property manager consults with an Acoustic Consultant or one of the Account Managers at Autex Industries.

Following these guidelines will develop classrooms that meet the students’ needs and provide a comfortable environment for the teachers to work in.





## INTERNATIONAL PROJECTS

Autex has worked with a number of International Schools to create acoustic solutions for classrooms. This process outlines the performance before and after Autex products are installed, and how this classroom sits against the ministry recommendations.

### International Projects Include:

- Elementary school retrofit project - Hawkes Bay / Gisborne region
- Westmount Kaipara Campus - Northland
- St James The Apostle - Victoria
- West London Free School - London
- British International School - Shanghai
- Harrow International School - Beijing
- NIST International School - Bangkok
- Kellett International School - Hong Kong
- French International School - Shanghai
- German Swiss International School - Hong Kong

## ENVIRONMENTALLY FRIENDLY

Autex manufactures from plastic bottle flakes and adds no binders other than heat, meaning the products are fully recyclable at the end of their lifetime. However, we guarantee the product on the wall will last at least 10 years with no colour fade or reduced performance.

We love the planet and so all of our products and processes follow best practice through our ISO 9001 and ISO 14001 accredited Quality and Environmental Management Systems.





## OPTIMISE LEARNING

The sound absorbing nature of Composition® creates a quiet and optimised environment for learning.

# Composition® Acoustic Fabric

## ACOUSTIC WALLCOVERINGS WITH ADDED FUNCTIONALITY

Reduce reverberated noise and add a vibrant feature to your environment with Composition® Acoustic Fabric.

An acoustic and decorative wall fabric, Composition® is the simple choice for managing echo and creating a durable interior solution. Available in an extensive range of colours with hook-and-loop receptive surface, Composition® provides the freedom to create a unique look in any space.

Made from Vertiface® fabric laminated to an acoustic, needle-punched and thermally bonded 100% polyester backing; Composition® reduces the need for extensive wall preparation and painting.

Transform your walls into acoustic notice boards by taking advantage of Composition's pinnable and hook-and-loop receptive surface, providing the perfect complement for primary schools and daycare, commercial offices, libraries and the hospitality industry.


### Key Features and Benefits

- Excellent acoustic performance
- Available in a wide range of colours
- Custom colour printing available
- Limitless branding and design possibilities with in-house custom-cutting
- Also available in a range of 600mm x 600mm Peel'n'Stick tiles for design freedom
- Lightweight and easy to handle
- UV stabilised and resistant to colour fade
- Pin, staple and hook-and-loop receptive allowing Composition® to be utilised as a display board
- Non-zip and non-fray for use with inserts and creating logos
- Made from 100% polyester fibre without chemical binders and certified low VOC
- Manufactured using a minimum of 60% post-consumer recycled material
- Highly durable providing long-term stability and performance
- Safe, non-toxic, non-irritant and non-allergenic
- Manufactured under ISO 9001 and ISO 14001 Quality and Environmental Management Systems

### Applications

- Acoustic pinboard, staple and hook-and-loop surface for education and commercial sectors
- Decorative and functional acoustic wallcovering for education, retail and commercial interiors
- Minimise noise in interior environments





**AUTEXO**

Interior Acoustics



### FOR ADDED EFFECT

The hook-and-loop functionality of Composition® allows for further sound absorption through adding personal touches and artwork.



### A BLANK CANVAS

Utilise Autex's specialised printing services to immortalise your design or logo and create a unique brand aesthetic.





**EXCITING FEATURES**  
Add excitement and vibrancy to learning environments with custom designs.



**FUNCTIONALITY**  
Composition® also doubles as a pinboard to turn your walls into acoustic noticeboards.







# Quietspace® Panel

## A HIGH PERFORMING ACOUSTIC PANEL

A high performing range of specialist acoustic panels; Quietspace® Panel is a premium acoustic solution for walls and ceilings. Quietspace® Panel is an innovative acoustic range that delivers exceptional reverberated noise control. Made from high-density 100% polyester; Quietspace® Panel is available as 1200mm x 2400mm semi-rigid panels from 25mm to 100mm thicknesses, designed to absorb a range of frequencies.

Lightweight, semi-rigid and easy-to-handle; Quietspace® Panel is frameless and can be cut on site to fit, avoiding the difficulties associated with fabric-wrapped acoustic panels. Quietspace® Panel can be used on walls or ceilings or framed to create unique modular feature panels.

Quietspace® Panel can be factory finished with Autex's needle-punched Veriface®, providing more than 30 colour choices. Options to custom-print, and custom-cut an image Quietspace® Panel provides a limitless medium for acoustic control.

### Key Features and Benefits

- Premium acoustic performance
- Offers complete design flexibility with our ability to provide custom colour printing
- Available in 25mm, 50mm, 75mm or 100mm thicknesses
- Made from 100% polyester fibre without chemical binders or retardants
- Manufactured using a minimum of 60% already recycled material from post-consumer waste
- Highly durable providing long-term stability and performance
- Safe, non-toxic, non-irritant and non-allergenic
- Impact resistance tested to Class 1A; not affected by impact velocities over 16.5m/s
- Light-weight and easy to handle

- Manufactured under ISO 9001 and ISO 14001 accredited Quality and Environmental Management Systems

### Applications

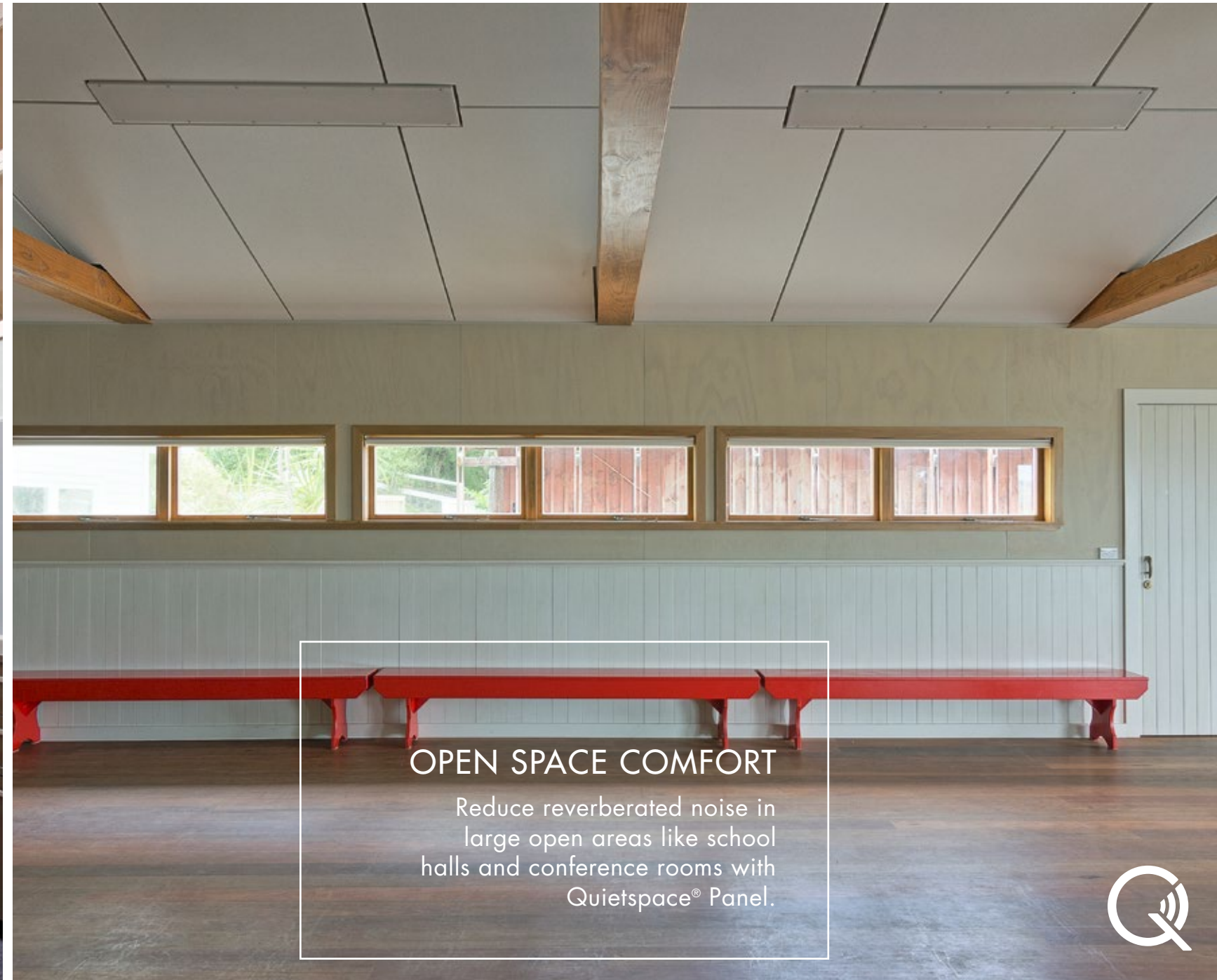
- High performing acoustic panel for reduced reverberated noise
- Premium acoustic surface for framed modular office partition panelling
- Suspended or direct fixed feature in ceilings
- Wallcovering with exceptional absorption of reverberated noise
- Functional acoustic wallcovering for retail and commercial interiors
- A decorative feature with custom cut and custom printing options available





**ENHANCE**

Direct fix and suspended Quietspace® Panel can be easily retrofitted to complement existing designs.



**OPEN SPACE COMFORT**

Reduce reverberated noise in large open areas like school halls and conference rooms with Quietspace® Panel.







“It’s easy for putting staples in, easy to flick them out... it just makes our life so much easier, it makes a hard job easy”  
Nicola Heuser - Teacher

# STUDENTS BENEFIT FROM REVITALISED LEARNING SPACES

## Project Background & Purpose

Three local Gisborne Schools have recently undergone a much needed retrofit of their older and relocatable, kitset classrooms as part of New Zealand’s Ministry of Education’s Modern Learning Environment programme. After the identification of potential structural failings, the Ministry of Education have undertaken a number of initiatives to extend the building life a further 20 years.

A requirement of this project was for the building envelope to be left uninterrupted whilst thermal and acoustic properties are brought up to an acceptable standard. Property services group School Support Limited took on this challenge and were very pleased with the finished results.

## Solution - Product & Installation

With more than 600 traditional prefabricated classrooms in the Hawkes Bay / Poverty Bay region; three local Elementary Schools were lucky to receive the first round of upgrades.

Developing the existing classrooms to extend their building life was considered highly cost effective compared to a new build classroom. As the buildings had no external building paper or insulation, encapsulating or insulating the walls internally was not an option, prompting School Support Ltd to seek out an alternative solution.

Aware of the high performing acoustic properties of 50mm Quietspace® Panel, Project Manager Phil Elms was pleased to learn that 50mm Quietspace® Panel also achieves an R-value rating of R1.48. Whilst enjoying the adherent acoustic benefits of the Noise Reduction Coefficient (NRC) of 1.00, the thermal properties of Quietspace® Panel have helped lift the total performance of the building envelope. Custom cut and slotted into aluminium joists; the Quietspace® Panels laminated with Atlantis coloured Veriface® overlay provided a great cost effective solution for building retrofits that require sound control and thermal performance.

Other products also used in the project included Koala coloured Autex Composition® which was used to transform walls between classrooms into acoustic notice boards, increasing overall acoustic performance and reducing reverberation. Made from 100% polyester fibre; Autex Composition® won’t stain, rot or break down making it a safe, non-toxic, long-lasting and sustainable acoustic wall treatment ideal for elementary schools, day care centres, commercial offices, libraries and the hospitality industry.

## Benefits & Feedback

Teachers had positive feedback on their freshly renovated teaching environments and believe that all schools would benefit from the upgrade.

Prior to installation, several teachers commented on how cold the classrooms were – especially in the mornings – and how easily students were distracted by both internal and external sources of noise. Now, classrooms are warm and cosy and there is no longer a need to turn on heat pumps which will be very cost effective in the long term. Noise had been recognised as an issue and students were easily distracted from their work or lessons at hand, resulting in teachers having to raise their voices. Post installation, teachers have noticed that students were much more focused and external noise sources were no longer a distraction. Teachers also loved the finished look of the classrooms, in particular the colours used and the overall calming effects the retrofitted rooms evoked.

## Future Projects

Due to the complete success of the trial upgrade - future projects are in the pipelines.

All students deserve to learn in a warm, calm and nurturing environment and Autex are very much looking forward to working with School Support Ltd on future retrofit classroom projects.

To read more inspirational case studies visit [www.autexindustries.com](http://www.autexindustries.com)



## PERSONAL TOUCH

Autex design engineers can work with architects, interior designers and facility planners to achieve the best acoustic outcome for your environment.

# Cube™

## ACOUSTIC MULTIMEDIA

Discover the limitless design flexibility of Cube™; a lightweight and semi-rigid panel that has sound absorbing properties. Designed with solid colour throughout, Cube™ has the potential to be used in a large array of spatial design and interior solutions.

More than just a traditional interior acoustic panel; Cube™ can be employed as a base material for creative solutions where design and aesthetics are important.

Cube™ is made from 100% polyester and manufactured under Autex's ISO 14001 accredited Environmental Management System. Containing a minimum of 65% post-consumer recycled material (PET bottle-flake); Cube™ is completely safe, non-toxic, non-allergenic and non-irritant. Redefine your environment with Autex Cube™.

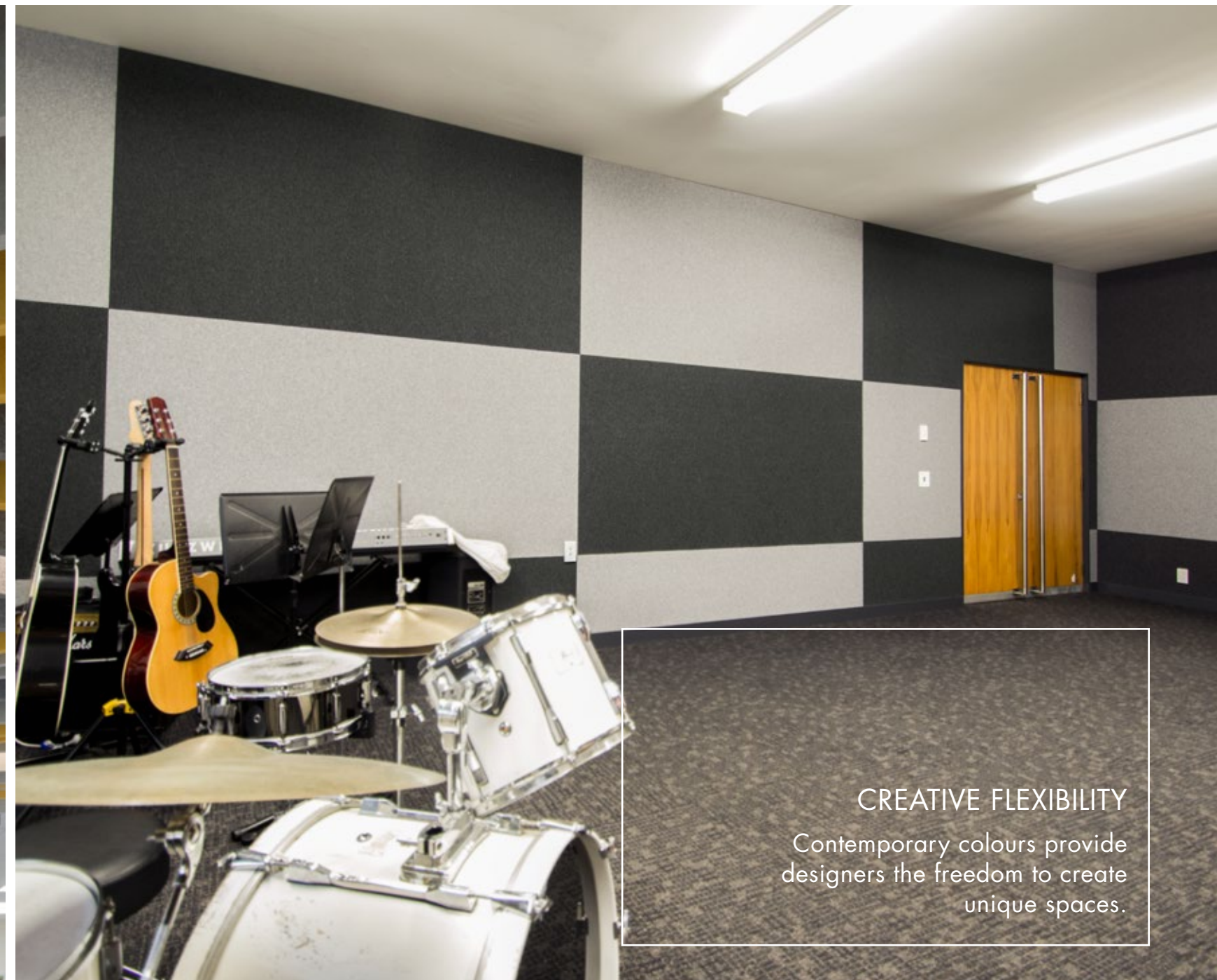
### Key Features and Benefits

- Design flexibility without the need for edging or capping, created with solid color throughout
- Excellent acoustic performance
- Custom colour printing available
- Limitless branding and design possibilities with custom cutting
- Light-weight and easy to handle
- Made from 100% polyester fibre without chemical binders and certified low VOC
- Manufactured using a minimum of 65% post-consumer recycled material
- Highly durable providing long-term stability and performance
- Safe, non-toxic, non-irritant and non-allergenic
- Manufactured under ISO 9001 and ISO 14001 accredited Quality and Environmental Management Systems
- Does not contain any Red List chemicals

### Applications

- Decorative and functional acoustic wallcovering for education, retail and commercial interiors
- Media for creative solutions
- Acoustic pin-board surface for education and commercial sectors
- Modular room divider for display, privacy and sound absorption
- Free-standing or direct fix acoustic panel





**CREATIVE FLEXIBILITY**  
Contemporary colours provide designers the freedom to create unique spaces.



## CUSTOM ACOUSTIC DESIGN

The unique Cube™ ceiling fin system controls noise reverberation at St James The Apostle School library.

# CREATIVE SOLUTIONS FOR INNOVATIVE LEARNING ENVIRONMENTS

New technologies in schools have resulted in a paradigm shift in the way educational spaces are created and used. Today's learning environments consist of flexible speaking and listening spaces where collaboration, group work, complex problem solving, digital information gathering and publishing occur.

Aware of a recent survey where a large scale of children in semi-open plan schools found that children are adversely impacted by noise which affects their ability to hear the teacher in critical situations; St James The Apostle Primary School wanted to address the significant acoustic issues they had in their newest open-plan classroom.

With more than one set of students occupying the space at the same time, teachers noticed significant noise spill issues when certain parts off the classroom were reading and others were working in collaborative group situations. As a result of the excessive background noise and reverberation level, this space was traditionally avoided as a teaching space and left utilised.

Employed by St James The Apostle Primary School; Centrum Architects were briefed to find an innovative solution that incorporated the existing operable wall in the centre of the space and also provided some design freedom. Having been inspired by Autex's Quietspace® Lattice the architects wanted to include the fin like feature of the suspended absorber but also to fit around the circular "reading area".

Offering versatility and creative freedom, Autex Cube™ was the obvious choice for this custom projects. It's solid colour throughout and structural integrity provides for a solution that doesn't need capped edges. Plied with the right acoustic information from Autex's Acoustic Design Engineer Jonathan Mounfort, Centrum Architects designed the eye-catching fish shaped ceiling feature.

Cut from 42 sheets of Acros coloured 12mm Cube™ on Autex's state of the art water cutting machine, the design resulted in 72.5m<sup>2</sup> of pure sound absorption. This high performing design creates an environment that controls reverberated noise to a level exceeding requirements of the Department of Education's recommendations for Innovative Learning Environments (ILE).

Now occupying the space on a regular basis the children and teachers have agreed they can now read, work and learn in an environment without being distracted from other groups and background noise. This approach to acoustic design allows classrooms to be exciting and unique and an environment where kids look forward to going to school without risking fatigue caused by poor acoustics.

Autex's experience in custom acoustic design for the education and other sectors prepare them for bespoke jobs that exceed acoustic requirements set by briefs.

For more inspirational case studies visit [www.autexindustries.com](http://www.autexindustries.com)







## COMMITMENT TO INNOVATION

Founded in 1967; Autex is a manufacturer and distributor of 100% recyclable polyester products. From their humble beginnings manufacturing carpet underfelts, Autex have lead the way in developing innovative, high-quality polyester products and solutions designed to meet customers' needs.

Pioneering new materials and systems; Autex's ranges of interior acoustics have enhanced the sound clarity in schools, theatres and commercial buildings in over 25 countries.

As well as a dedicated focus to proactive product development, Autex are committed to best practices. Certified in ISO 9001 and ISO 14001 Quality and Environmental Management Systems; Autex continue to achieve new standards in their global environmental foot-print.

### Key Products

Autex manufactures a premium range of interior acoustic products and wallcoverings made from 100% recyclable polyester which are designed to reduce echo and reverberated sound. With unlimited potential for architectural design; Autex's range of interior acoustics and wallcoverings can be printed on, custom cut to shape and specified to fit any application where sound control and design aesthetic is crucial.

As leaders in interior acoustics, Autex have the expertise to provide free reverberation calculations and consultation on the best approach to achieving effective sound absorption in your space. Autex's experienced design engineers are available to work alongside architects, interior designers and facility planners to create bespoke solutions that achieve the best possible acoustic outcome to redefine your environment.

Incorporating Autex's interior acoustic solutions into architectural design greatly diminishes reverberated noise by absorbing sound and creating a comfortable environment.



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