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August 2014

Attention the Body Corporate

As you are probably aware many apartment owners have become dissatisfied with acoustic performance of building built to the BCA minimum impact standard.
We can help you with drafting-up a by-law that would set a minimum standard at the level recommended by your body corporate which is:

- easily understood and implemented; and
- can be easily verified whether through technical data sheets or some other means to enable confirmation that the flooring meets the by-law requirements and can be signed off by the installer / product supplier as having done so.

We can advice as to the type and quality of hard flooring including method of installation that would provide the greatest protection against noise transference between units.

We would also comment on quality and performance of the finished product so owners voting on the by-law would have a solid appreciation of what noise, if any, would be expected between units together with some tips on how to further lower the potential impact of noise from day to day living activity.

The methodology we are proposing is two-fold:

1. Independent Acoustical engineering test to be carried out first,
2. Then we will supply a comprehensive set of sketches and installation drawings with comments and advice to help you with the drafting of the by-laws.

First you should be aware that each floor / slab is different.
Ease of impact transmission depends principally on the following factors & construction systems:

- Size, thickness of the concrete slab
- Density of the concrete
- Span of the slab (distance between the slab supports)
- Amount of steel reinforcement in the slab
- The presence (or not) of a suspended ceiling under the slab
- The cavity size between the suspended ceiling and the slab
- The presence (or not) of insulation in the ceiling cavity

Acoustic underlay to suit all timber flooring

Acoustic Underlay *Acoustic Solution Provider*

Choosing the right AngelStep®

for
Hard Floor Impact Noise Treatment
with certified impact floor rating

If you are considering installing a new floor finish such as *engineered or solid tongue & groove timber floor, ceramic tiles, etc.*, to an existing suspended structural floor you probably require an impact noise treatment.

As you are probably aware, many apartment owners have become dissatisfied with the acoustic performance of buildings built to the minimum BCA impact standard of $L_{nw}+C_I$ equal to or less than 62.

It is very important that you should also be aware that not all suspended Structural floors have the same construction or material. It can be a timber structural floor, reinforced concrete or composite of many different configurations.

The ease of impact transmission depends principally on the following and existing construction systems.

- Size and thickness of the concrete slab or structural timber floor
- Density of the concrete
- Span of the slab (distance between slab supports)
- Amount of steel reinforcement
- The natural slab vibrations characteristics
- The presence (or not) of a suspended ceiling under the structural floor
- The cavity size between the suspended ceiling under the slab and the slab or structural floor
- The presence (or not) of recessed lights and insulation in the ceiling cavity under the structural floor

Due to our extensive experience and number of tests performed, Acoustica can give a good approximate impact result using your chosen / preferred floor surface finish.

Certified Impact Floor Rating

Should the body corporate require a guaranteed high level of impact insulation, Acoustica has developed the following methodology:

- Acoustica can perform a series of in-situ tests (by an independent acoustical engineering company), in your (or a typical) apartment in the building.
- Residents are welcome to witness the tests, giving them a "real feel" of the transmitted noise with different floor coverings.
- Our engineers are 'on-hand' during the tests and can answer all questions. We will endeavor that the proposed solution will achieve the highest impact noise insulation as well as airborne Sound Transmission Loss.

Costs & Report Supplied

A full independent test report can be issued with the results.
This can also give the basis for the inclusion in the building minimum standard 'by-law' regulation.

A full set of sketches & installation drawings are supplied for the building specific needs, including different floors finishes (eg. ceramic tiles, solid T&G timber floating floor, engineered floor, linoleum, etc.)

A typical "Tapping Test" can be performed on 4-5 different products with different surfaces (eg; engineered timber floating floor, ceramic tiles, etc.)

Cost on application.

As you can see, just giving a rating for an acoustic underfloor product is not always (and most of the time) representative of the outcome impact insulation rating on this particular floor.

This is why we propose that an independent acoustical engineering company carry out a series of in-situ tests in a typical apartment in the building.

A typical "Tapping Test" costs $1,200.00 - $ 1,400.00 (+GST) approx. and is performed on 4 or 5 different products with different surfaces (e.g.; engineered timber floating floor, ceramic tiles etc.)
Residents are welcome to witness the tests giving them the real "feel" of the transmitted noise with different floor coverings.

The material to be tested has already been chosen in order to achieve the best insulation / Sound Transmission Loss for that particular building.
A full independent test report is then issued with the results, which will give the basis for the inclusion in the building minimum standard 'by-law' regulation.

We will also be supplying a comprehensive set of sketches and installation drawings for the building specific needs, including different floor finishes (ceramic tiles, solid T&G timber floating floor, engineered floor, linoleum...)
Cost for this is based on our hourly rate of $140.00 +GST, and estimated cost is around $1,800.00 + GST.

Please let me know if you need more details regarding our proposal. As you can see, once you have that by-law in place, it would eliminate wasting so much time and money going through this every time a new resident wishes to renovate.

Do not hesitate to give me a call if you wish to discuss this further.

Yours sincerely,

Philippe Doneux
Engineer

COMPANY PROFILE

Acoustica® is an Australian owned company founded in 1982 when perforated steel was a major component in soundproofing solutions. Today, the company is a global leader in the research, development and manufacture of leading technology sound control and noise abatement systems utilising visco-elastic technology.

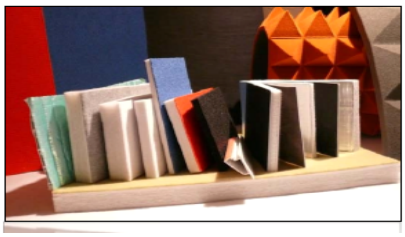
In 1991 Acoustica® was the first to introduce polyester sound and thermal insulation materials to Australia, revolutionising the industry in overcoming health and recycling issues. This was followed by the adoption by SANIP (Sydney Airport Noise Insulation Program) of Acoustica's residential dwelling pilot program as the specification for all dwellings included in the insulation program.

It was in 2005 when the NSW Government Industry Minister announced that Acoustica® had won the 'Excellence in Innovation Award for Outstanding Innovation', for the new QuietWave® plasterboard wall system. With a six star acoustic rating, QuietWave® has the highest drywall acoustic performance at half the thickness and 30Kg/m2 lighter than conventional drywall systems.
Also in 2005, Acoustica was accepted into the prestigious ATS (Australian Technology Showcase) for 'Revolutionary Technology for Acoustic Control'. The ATS is sponsored by the Australian Federal & State Governments to promote innovative Australian technology worldwide.

At the Australian Marine Industry Federation awards in 2006, Acoustica's world patented VyBar® marine acoustic insulation was recognised with a commendation award in the 'Innovative Product of the Year' category.

In 2007 the Acoustica® Group was recognised in three awards. Acoustica was the winner of the innovation category of the Australian Anthill Magazine 2007 'Cool Company Awards'. The Federal minister for Australian Industry presented Acoustica® with the Innovation Award for the QuietWave® wall system.
In the same year Acoustica® were finalists in the 'Excellence in Innovation' category for the 'Western Sydney Awards' for their new fire coating and fire rated products which was followed by the 'NSW Pitchfest Awards' for the QuietWave® revolutionary acoustic wall system and Vulcanite® low cost fire resistant ceramic.

The Acoustica Group in 2008 won the Engineers Australia 'Small Business Ventures Excellence Award' for their QuietWave® Eco Wall System.
They were also finalists in the Banksia Foundation 'Eco Innovation Award' and the Environmental category of Innovic's the 'Next Big Thing Award' for their QuietWave® Eco Wall System.
In November 2008 Acoustica wins the 'New Inventors' Episode 42 and the 'Peoples Choice Award' for QuietWave® Wall System and was one of the five Grand Finalists.
In October 2014, QuietWave SQ wins the GREENOV Award in the Innovation Category for a solution in the area of sustainable renovation.



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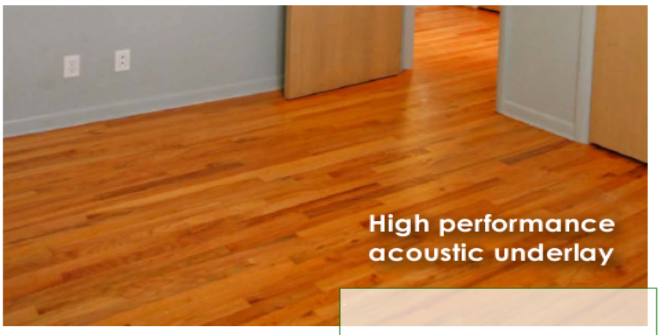
AngelStep® 4

Flexible Noise Barrier Underlay
Designed specially for thin Engineered flooring



The AngelStep® range has superior performance properties to any recycled rubber or closed cell foam products.

AngelStep® noise barrier underlay combines Resilience, High Density, Sound Absorption.

Applications

- Residential Apartments
- Commercial offices
- Hotels & Motels
- Restaurants, Food Halls, Cafés
- Universities & schools
- Galleries, libraries
- Cinemas, home theatres
- Shopping/retail Centres

- ✓ A very thin product with the Highest performance*
- ✓ High sound absorption
- ✓ High impact insulation & strength
- ✓ Water and most chemical resistance
- ✓ 10 year Guarantee
- ✓ Easy to install

* Refer tests over the page

AngelStep®4

Highest performance underlay

Features

- ✓ Highest performance
- ✓ 10 year Guarantee
- ✓ High impact insulation & strength
- ✓ Suitable to combine with floor heating systems
- ✓ Will retain it's thickness over time even under very heavy loads
- ✓ Easy to install
- ✓ Patent pending

Description

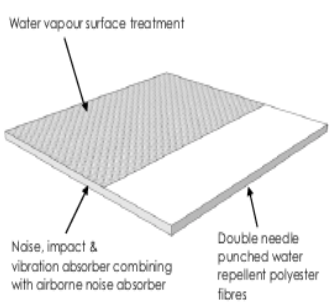
AngelStep® 4 provides an economical, highly effective support and cushion for timber, engineered flooring or ceramic tiles.

AngelStep® 4 is water resistant and will last the life of the building.

AngelStep® 4 combines the following:

- ✓ Vapour barrier
- ✓ High sound absorption
- ✓ High impact insulation & strength
- ✓ Water and most chemical resistance
- ✓ PVC, EVA Free
- ✓ Low Volatile Organic Compounds (VOC's)
- ✓ No Plasticisers
- ✓ Available in large tiles 1150mm x 1150mm
- ✓ Field tested by Acoustic Dynamics Pty Ltd, Wilkinson Murray and Marshall Day Acoustics (Tests carried out on a number of different scenarios)

Construction



NOTE:
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Floor System Tested	Measured 'Field' Sound Transmission Performance L_{nw}
* 220mm bare concrete slab & skim coat render ceiling below	84
"TARQUET" Vinyl strip laminated floor over AngelStep 4	50

* Test by West & Associates

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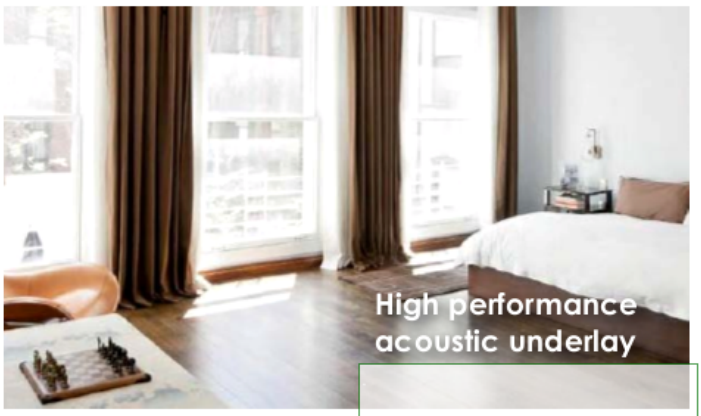
AngelStep® 8

Flexible Noise Barrier Underlay
Designed specially for floating floors



The AngelStep® range has superior performance properties to any recycled rubber or closed cell foam products.

AngelStep® noise barrier underlay combines Resilience, High Density, Sound Absorption.

Applications

- Residential Apartments
- Commercial offices
- Hotels & Motels
- Restaurants, Food Halls, Cafés
- Universities & schools
- Galleries, libraries
- Cinemas, home theatres
- Shopping/retail Centres

- ✓ A very thin product with the Highest performance*
- ✓ High sound absorption
- ✓ High impact insulation & strength
- ✓ Water and most chemical resistance
- ✓ 10 year Guarantee
- ✓ Easy to install

* Refer tests over the page

AngelStep® 8

Highest performance underlay

Features

- ✓ Highest performance
- ✓ 10 year Guarantee
- ✓ High impact insulation & strength
- ✓ Suitable to combine with floor heating systems
- ✓ Will retain it's thickness over time even under very heavy loads
- ✓ Easy to install
- ✓ Patent pending

Description

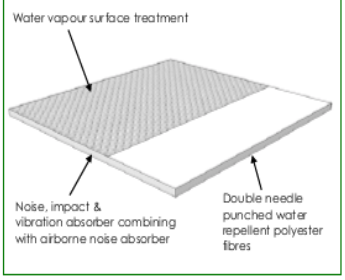
AngelStep® 8 provides an economical, highly effective support and cushion for timber, engineered flooring or ceramic tiles.

AngelStep® 8 is water resistant and will last the life of the building.

AngelStep® 8 combines the following:

- ✓ Vapour barrier
- ✓ High sound absorption
- ✓ High impact insulation & strength
- ✓ Water and most chemical resistance
- ✓ PVC, EVA Free
- ✓ Low Volatile Organic Compounds (VOC's)
- ✓ No Plasticisers
- ✓ Available in large tiles 1150mm x 1150mm
- ✓ Field tested by Acoustic Dynamics Pty Ltd, Wilkinson Murray, West & Associates and Marshall Day Acoustics (Tests carried out on a number of different scenarios)

Construction



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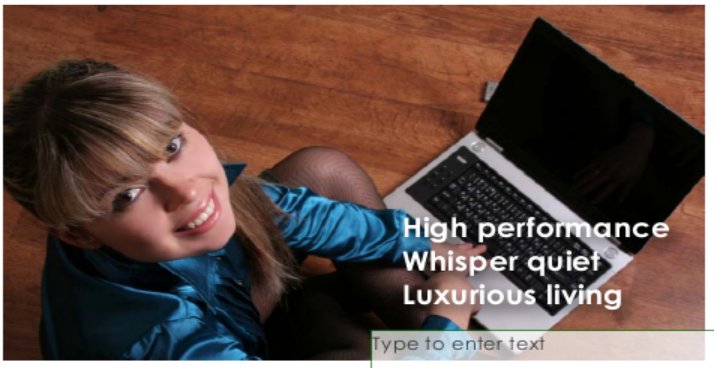
Floor System Tested	Measured 'Field' Sound Transmission Performance L_{nw}
*13mm Engineered Timber Flooring and a concrete slab (180mm and a cavity ceiling)	49, -7
*13mm Engineered Timber Flooring, a layer of AngelStep 8 and a concrete slab (180mm and a cavity ceiling)	38, -2

* Test by West & Associates

AngelStep® SQ

6 Star* Rating acoustic floor treatment

Micro Cellular Flexible Noise Barrier Underlay



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The '*SQ* ' (*S*uper *Q*uiet) range has superior performance properties to the Visco-elastic product range.

Applications

- Residential Apartments
- Commercial office buildings
- Hotels & Motels
- Restaurants, Food Halls, Cafés
- Universities & schools
- Galleries, libraries
- Cinemas, home theatres
- Shopping/retail Centres

- ✓ Highest performance up to $L'_{nT,w}(C_1)$ 42
- ✓ High sound absorption
- ✓ High impact insulation & strength
- ✓ Water and most chemical resistance
- ✓ 10 year Guarantee
- ✓ Easy to install

Global GreenTag$^{Cert™}$ GreenRate Level C Certification of QuietWave®BioFoam
QuietWave® BioFoam is a patented biologically derived, flexible noise barrier and vibration damping material used in commercial and residential applications as an acoustic noise barrier for walls, ceilings, partitions, flooring, furniture and pipe lagging.

AngelStep® SQ

Highest performance underlay

Features

- ✓ Highest performance
- ✓ Achieves AAAC Rating $L_nT_w+C_1$ 42
- ✓ 10 year Guarantee
- ✓ High impact insulation & strength
- ✓ Suitable to combine with floor heating systems
- ✓ Offers 100% memory
- ✓ Easy to install
- ✓ Patent pending

Description

AngelStep® SQ is a revolutionary micro cellular flexible noise barrier.

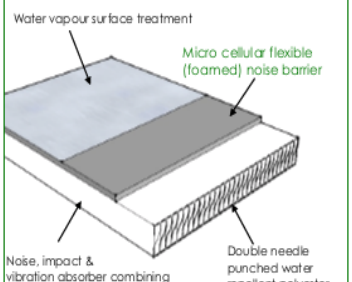
AngelStep® SQ provides an economical, highly effective support and cushion for timber, engineered flooring or ceramic tiles.

AngelStep® SQ is water resistant and will last the life of the building.

AngelStep® SQ combines the following:

- ✓ Vapour barrier
- ✓ Visco-elastic **'green'** noise barrier
- ✓ High sound absorption
- ✓ High impact insulation & strength
- ✓ Water and most chemical resistance
- ✓ PVC, EVA Free
- ✓ Low Volatile Organic Compounds (VOC's)
- ✓ No Plasticisers
- ✓ Available in large tiles 1150mm x 1150mm
- ✓ Field tested by Acoustic Dynamics Pty Ltd, Wilkinson Murray and Marshall Day Acoustics (Tests carried out on a number of different scenarios)

Construction



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Floor System Tested	Measured 'Field' Sound Transmission Performance	
1. 114mm bare concrete slab & skim coat render ceiling below	73 (-11)	73 (-11)
	Single Layer	Double Layer
2. 19mm timber floor boards; over 19mm plywood; over 6mm thick AngelStep	56 (3)	52 (2)
3. 6mm ceramic floor tiles; over 2mm tile adhesive over 12mm FC sheeting; over 6mm AngelStep	52 (2)	42 (2)
4. 8mm Floating engineered timber/bamboo flooring; over 6mm thick AngelStep	54 (1)	52 (3)

AngelStep® 48P & 484P

Acoustic Flooring Underlay

AAAC 6 Star acoustic performance for impact and airborne noise

AngelStep® flooring underlay combines premium acoustic performance with minimum added floor height.

AngelStep® achieves the highest possible AAAC (Association of Australian Acoustical Consultants) 6 Star rating for tile and timber flooring on a concrete substrate (test report No: 002 2007125).

- ✓ **Features:**
- ✓ Impact Isolation Absorber combined with airborne sound barrier
- ✓ Superior performance with minimum underlay height
- ✓ Water Repellent
- ✓ Indefinite life cycle. Will not rot or break down
- ✓ Ease of installation. Ideal for retrofit and new installations.
- ✓ Recycled materials. Textile material comprises up to 75% recycled material
- ✓ Continuous support between substrate and floor
- ✓ Cost Effective 6 star floor system
- ✓ Fire rated to Australian and International standards

The Building Code of Australia (BCA) regulates the minimum acceptable construction standard for buildings and in Clause F5.4 (a) stipulates the weighted normalised impact sound pressure level $L_{n,w}$ plus the spectrum adaption term Ci. The BCA minimum impact standard for a floor in a class 2 or 3 building is to be no more than $L_{n,w}+C_1 \leq 62$. AngelStep® with an impact sound pressure level on a concrete substrate of no more than $L_{n,w}+C_1$ of 40, exceeds the BCA requirements by 22 points.

Many apartment owners have become dissatisfied with the acoustic performance of buildings built to the BCA minimum impact standard of $L_{n,w}+C_1 \leq 62$, which some building industry members have interpreted as absolute rather than minimum requirements.

To address the concerns of the community and industry the AAAC introduced a star rating system to promote better standards of acoustic quality. AngelStep® acoustic underlay carries the maximum AAAC 6 Star rating compared to low end rating of $2^{1/2}$ for the BCA, $L_{n,w}+C_1 \leq 62$ minimum acceptable standard, a level of amenity which many owners, occupiers and developers will find unacceptable.

Acoustic Performance

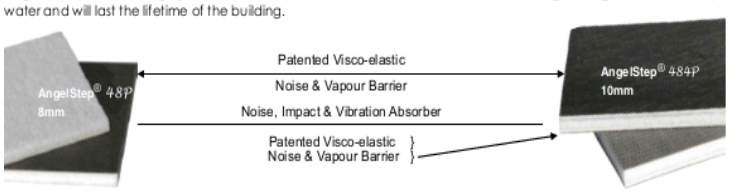
TYPE	AAAC Stars	L'n,w +Ci **(Impact)**	Indicative Sound Performance
Acoustica AngelStep	5/6	36	Generally just Audible or not Audible
10mm Rubber Matting	5	45	Just Audible
5mm Rubber Matting	4	50	Audible
2mm Closed Cell Foam	3	55	Clearly Audible
BCA Compliance		62	Clearly Audible
	2	65	Clearly Audible

AngelStep® 48P & 484P

6 Star Floor Underlay

Construction

AngelStep® provides a highly effective support and cushion for timber, laminate and tiling flooring, is unaffected by water and will last the lifetime of the building.



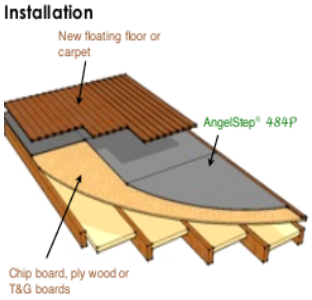
AngelStep® consists of an 8 mm thick impact, noise and vibration damping absorber made from 75% recycled materials combined with a decoupled 'visco-elastic' noise barrier. AngelStep® 48P with one noise barrier is used over a concrete substrate. AngelStep® 484P with the absorber sandwiched between 2 layers of 2mm thick noise and vapour barriers is for use over a timber substrate.

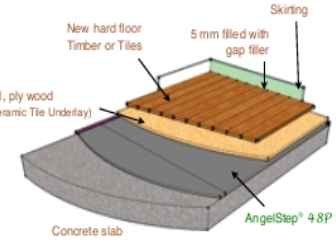
Supply Details

AngelStep®	Barriers	Thickness	Size	Weight	Use Over
484P	2	10 mm	1150 x 1150mm	9 kg/m²	Timber/Ply/MDF
48P	1	8 mm	1150 x 1150mm	5 kg/m²	Concrete Floors

Flammability	= 0
Spread of Flame	= 0
Heat Evolved	= 0
Smoke Developed	= 0-1

Installation



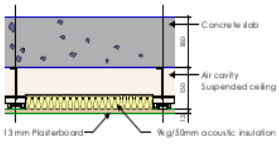


Test Results

AngelStep® test results are from Marshall Day Acoustics Report No: 002 2007125, 10 Dec 2007, with a base floor construction as follows:

The base floor/ceiling construction, as shown in diagram, is considered to be representative of the performance of a typical masonry floor system that could be installed in an apartment that is required to achieve compliance with the impact sound insulation ratings detailed in the 2007 version of the Building Code of Australia: e. $L_{nw}+C_I \leq 62$.

A timber or tiling floor installed with AngelStep® 48P achieves an $L_{n,w}+C_I$ 40 6 star performance with a floor/ceiling construction as per figure.



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NEW

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the quiet Australian

AngelStep® GOLD 4 - AAAC 5 Star Rating

An Economic High Performance Acoustic Flooring Underlay

Apartment dwellers have long complained about *impact* noise intrusion due to footsteps and clatter of utensils and articles dropped on to the floor in apartments overhead. In addition to this impact noise, many occupants have also endured excessive *airborne* noise transmitted from powerful TV and audio systems.

Owners and occupants are concerned with the acoustic performance of apartments built to BCA minimum standards

In response to the concerns of apartment occupiers with the 2005 Building Code of Australia (BCA) minimum acceptable noise transmission standards, the Australian Association of Acoustic Consultants (AAAC) produced a Star rating system to fulfil a need identified by the community.

AAAC 5 Star acoustic rating system developed to address the noise concerns of building occupants

The intent of the AAAC rating system was to encourage consistency between the apparent quality of apartment and townhouse design and the acoustical quality. The result was a rating system of between 2 to 6 Stars.

Now there is a new Economic Gold Standard - AngelStep® GOLD 4 An AAAC 5 Star Performer

Field tests have achieved a 5 Star rating – streets ahead of the BCA minimum*
**BCA minimum standard for impact noise equates to midway between AAAC 2 and 3 Stars out of possible 6 Stars.*

Benefits - *Noise overhead.. all quiet below*

✓ **Enduring performance**

No degradation of acoustic properties due to structural collapse under the weight of heavy furniture, castors and appliances.

✓ **Easily installed**

AngelStep® GOLD 4 has been engineered as an underlay for all solid timber and floating engineered floors (laminated, bamboo...) to deliver optimum acoustic performance for minimum thickness.
Fast and effortless installation, no special tools required, easy handling due to lightweight construction.

AngelStep® GOLD 4

High Performing Acoustic Underlay

Features

AngelStep® GOLD 4 is water resistant and will last the life of the building.

- ✓ Suitable to combine with floor heating systems
- ✓ "Just Right" thickness for comfort and stability
- ✓ Easy installation
- ✓ Guaranteed for the life of the building

AngelStep® GOLD 4 combines the following:

- ✓ Vapour barrier
- ✓ High sound and impact energy absorption
- ✓ Water and most chemical resistance
- ✓ Low Volatile Organic Compounds (VOC's)

AngelStep® GOLD 4 was initially designed for use in professional office and consulting suites where discerning buyers expect performance beyond that mandated by the minimum requirements of the BCA.

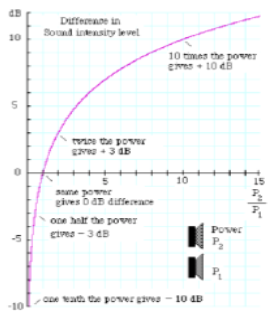
Today, as occupier expectations for mitigating noise transmission have moved ahead of regulations, **AngelStep® GOLD 4** has found favour in the mainstream market to still achieve premium performance and peace of mind of building residents

AngelStep® GOLD 4 is ideal for retrofitting in existing apartments where new timber flooring systems are being installed and where the Body Corporate has to be *absolutely* assured of performance.

Note: To the human ear a 3db difference means either a doubling or halving of the perceived noise level. (refer to graph below.)

In summary, **AngelStep® GOLD 4** should be used by all those who value their or their customers privacy and consider that silence is indeed **GOLDEN**.

What a difference a decibel makes!



BCA	Bare Concrete	AngelStep GOLD 4 Laminated Timber
LnTw 62	L'nw 68 + (CI) -12	L'nw 44 + (CI) -1

***NOTE:**
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Recommended Installation ** for

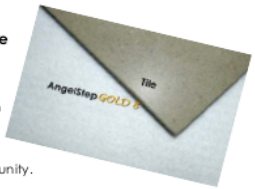
- Solid timber
- Engineered timber
- Laminated timber
- Bamboo
- Carpet

** Consult with Acoustica if in doubt

AngelStep® GOLD 8 - AAAC 6 Star Rating

Today's new standard for Acoustic Flooring Underlays

Apartment dwellers have long complained about *impact* noise intrusion due to footsteps and clatter of utensils and articles dropped on to the floor in apartments overhead. In addition to this impact noise, many occupants have also endured excessive *airborne* noise transmitted from powerful TV and audio systems.



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AAAC 6 Star acoustic rating system developed to address the noise concerns of building occupants

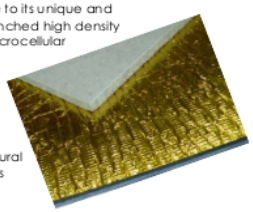
The intent of the AAAC rating system was to encourage consistency between the apparent quality of apartment and townhouse design and the acoustical quality. The result was a rating system of between 2 to 6 Stars.

Now there is a new Gold Standard - AngelStep® GOLD 8 – The ultimate AAAC 6 Star Performer

AngelStep® **GOLD 8** resets the bar for the acoustic performance of flooring underlay. Field tests have achieved the ultimate 6 Star rating – streets ahead of the BCA minimum (*BCA minimum standard for impact noise equates to midway between AAAC 2 and 3 Stars out of possible 6 Stars*).

Unique Construction

The unrivalled performance of AngelStep® **GOLD 8** is due to its unique and patented construction -- a laminate of double needle punched high density sound absorbent polyester and a resilient "cross linked" microcellular foam to form an 8 mm thick.
Available in sheets 1150mm x 1150mm.



Benefits - *Noise overhead.. all quiet below*

✓ **Enduring performance**
No degradation of acoustic properties due to structural collapse under the weight of heavy furniture, castors and appliances.

✓ **Universal Underlay - "One size fits all"**
Unlike competitive underlays AngelStep® **GOLD 8** has been engineered as a universal underlay to deliver optimum acoustic performance according to the flooring type. Select installation option – of polyester side facing up/down or foil moisture barrier side facing up/down depending on end result required (suggestions over page).

AngelStep® GOLD 8

High Performing Acoustic Underlay

Features

AngelStep® GOLD 8 is water resistant and will last the life of the building.

- ✓ Suitable to combine with floor heating systems
- ✓ Excellent Thermal insulation
- ✓ Castor resistant
- ✓ Guaranteed for the life of the building

AngelStep® GOLD 8 combines the following:

- ✓ Vapour barrier
- ✓ High sound and impact energy absorption
- ✓ Water and most chemical resistance
- ✓ Low Volatile Organic Compounds (VOC's)

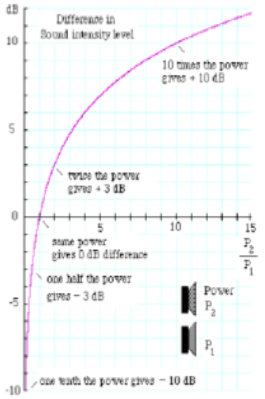
AngelStep® GOLD 8 was initially designed for use in prestige apartments and townhouses, upmarket housing and professional office and consulting suites where discerning buyers expect performance beyond that mandated by the minimum requirements of the BCA.

Today, as occupier expectations for mitigating noise transmission have moved ahead of regulations, **AngelStep® GOLD 8** has found favour in the mainstream market due to the modest additional cost to achieve premium performance and peace of mind of building residents **(To the human ear a 3db difference means either a doubling or halving of the perceived noise level.** See graph below.)

AngelStep® GOLD 8 is ideal for retrofitting in existing apartments where new flooring systems are being installed and where the Body Corporate has to be *absolutely* assured of performance.

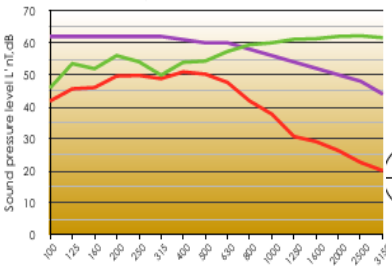
In summary, **AngelStep® GOLD 8** should be used by all those who value their or their customers privacy and consider that silence is indeed **GOLDEN**.

What a difference a decibel makes!



Test Results

Tapping Test between 2 units in Kirribilli



— Bare Concrete - L'nw 68

— Laminated Timber - AngelStep GOLD 4, fall up under 15mm laminated timber, L'nw +(C) 44 (-1)

— Note: Ln,w+CI 62 BCA 2014 Req.

Frequency f (Hz)	Test 1dB Results	Test 2 dB Results	Test 3 dB Results	Test 4 dB Results
	Ln 68	L'nw+(C) 37 (+1)	L'ntw+(C) 36+1 (0)	L'ntw+(C) 38 (0)

***NOTE:**
The data listed in this document are based on tests conducted by independent Acoustic Engineers - Praxis Acoustics and West & Associates. Tests are indicative only and materials should be tested under actual service to determine their suitability for a particular purpose. Specifications are subject to change without notice. Full test reports available upon request.

Recommended Installation **

Gold Foil Up:

- ➡ Solid timber
- ➡ Engineered (Laminated) Timber
- ➡ Veneer
- ➡ Carpet
- ➡ Bamboo

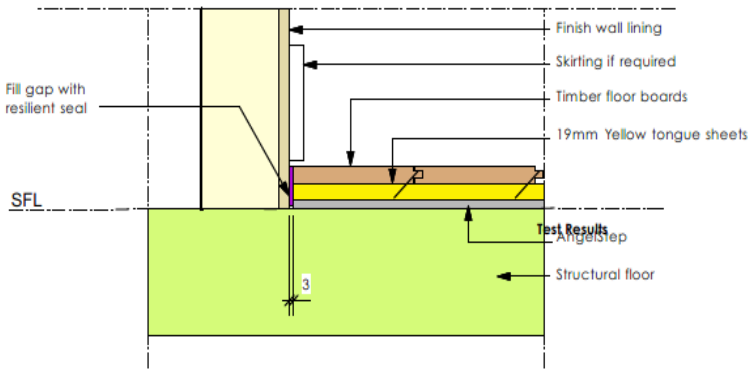
Gold Foil Down:

- ➡ Parquetry
- ➡ Ceramic Tile
- ➡ Vinyl
- ➡ Cork

** Consult with Acoustica if in doubt

AngelStep® - Yellow Tongue - Timber Floor

Acoustic Underlay



001 TGF2 SECTION

Acoustic ceiling treatment
AngelStep installation - Tongue & groove timber floor

AngelStep product comes in 6mm,8mm,10mm
Choice of AngelStep varies subject to :
- floor structure, floor span, type of materials,
- floor thickness , density,
- acoustic tests

Acoustic performance of floors will vary with above parameters

ANGELSTEP INSTALLATION
Floating floor using Yelow tongue as substrate for tongue and groove timber floor.

- Structural floor must be levelled, to parquetry installation standard tolerances.
- Floor to be clean and free of debris.
- Fill gaps and holes in floor if existing. Fix any squeaking in timber floor.
- Install AngelSteps butted together.
- Leave 3mm gap between wall and finish surface.
- Spot glue AngelStep with maxibond or equal.
- Install yellow tongue directly onto AngelStep .
- Ensure that the new floor stay 3 mm from walls.
- It is preferable to install skirting after floor has been installed . Leave a 2 to 3mm gap. between floor finish and skirting. (seal with silicone sealant)
- Install timber floor as per AS standard and manufacturers recommendations.Fix boards to yellow tongue only.

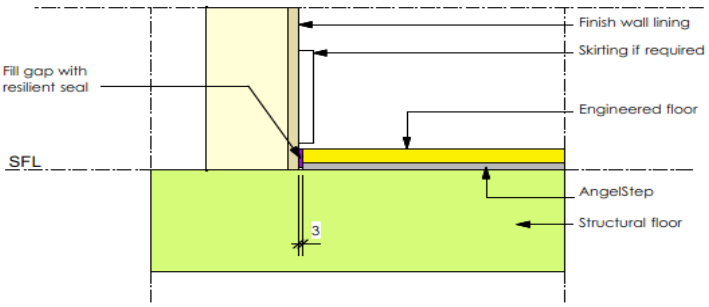
- Use a stanley knife or equal to cut product.
- Seal gaps between wall & new floor with silicone sealant to form a resilient seal.

Do not fix through the AngelStep

ANGELSTEP INSTALLATION - YELLOW TONGUE - TIMBER FLOOR - ASI YT TGF DG02

AngelStep® - Engineered Timber Floor

Acoustic Underlay



001 EF03 SECTION

Acoustic ceiling treatment
AngelStep installation - Egineered floor

AngelStep product comes in 6mm,8mm,10mm
Choice of AngelStep varies subject to :
- floor structure, floor span, type of materials,
- floor thickness , density,
- acoustic tests

Acoustic performance of floors will vary with above parameters

ANGELSTEP INSTALLATION
Floating floor using Yelow tongue as substrate for tongue and groove timber floor.

- Structural floor must be levelled, to parquetry installation standard tolerances.
- Floor to be clean and free of debris.
- Fill gaps and holes in floor if existing. Fix any squeaking in timber floor.
- Install AngelSteps butted together.
- Leave 3mm gap between wall and finish surface.
- Spot glue AngelStep with maxibond or equal.
- Install timber floor as per AS standard and manufacturers recommendations.
- Ensure that the new floor stay 3 mm from walls.
- It is preferable to install skirting to wall only after floor has been installed . Leave a 2 to 3mm gap between floor finish and skirting. (seal with silicone sealant) . If installing quads, install only to wall or floor. Maintain separation between wall and floor.

- Use a stanley knife or equal to cut product.
- Seal gaps between wall & new floor with silicone sealant to form a resilient seal.

Do not fix through the AngelStep

ANGELSTEP INSTALLATION - ENGINEERED TIMBER FLOOR - ASI EF DG03

MATERIAL SAFETY DATA SHEET

PRODUCT NAMES: AngelStep

NOT CLASSIFIED AS HAZARDOUS ACCORDING TO THE CRITERIA OF WORKSAFE AUSTRALIA

AngelStep® - MSDS

Acoustic Underlay

COMPANY DETAILS

Company Name	Acoustica Pty Ltd
Address	Grd Flr 6A Nelson St Annandale NSW 2016
Telephone/Fax	Tel: 1300 722 825 or +61 2 9550 2900 FAX: +61 2 9550 5665
Email:	info@acoustica.com.au
Date:	12/12/2012

IDENTIFICATION

Product Grades	AngelStep
UN number	Not Applicable
Dangerous Goods Class	Not Applicable
Subsidiary Risk	Not Applicable
Hazchem Code	Not Applicable
Poisons Schedule No.	Not Applicable
Product Use	AngelStep is an acoustic underlay for carpet and solid timber or laminate floating floors. AngelStep's construction combines a highly effective support and cushion for floating floors. It provides maximum performance for minimum thickness combining an impact and vibration damping and sound absorber with a decoupled noise barrier.

PHYSICAL DATA

Appearance	AngelStep is a bonded polyester material. AngelStep comprises of a 4mm - 8mm layer of double needle punched polyester matting sandwiched with a single layer of 4kg/m2 'visco-elastic' polymer flexible noise barrier.
Smell	AngelStep is odourless
Melting Point	150°C
Rec. Max. Service Temp.	120°C
Vapour Pressure	Not Applicable
Flash Point	Not Applicable
Per Cent Volatiles	Nil
Specific Gravity	1.38
Flammability	Acoustica polyester insulation both thermal and acoustic is a self extinguishing product. It conforms to the building code requirements (NZ/Aust) as tested to AS 1530 Part 3, with a 4 zero fire rating:

Ignitability (0-20)	**0**
Spread of Flame (0-10)	**0**
Heat Evolved (0-10)	**0**
Smoke Developed (0-10)	**0-1**

Moisture Absorption	Exposure to an atmosphere of 50°C & 95% Rh for four days gives a moisture absorption of less than 0.2% by volume
Alkalinity	pH 7.8 (pH 7 is neutral)
Corrosiveness	Non corrosive
Chemical Entity	Products are composed of organic long chain synthetic polymers of carbon, hydrogen and oxygen
Other Properties	The fibres used in the thermal bonded insulations are 100% polyester and may range from 8 micon to 40 micon in diameter. No other agents or chemicals are present in the products. The products are non-allergenic, resilient and have a low flame response.
Health Hazard Information	No known physical or health hazards associated with this product. No toxic reactions have been observed, no adverse health effects have been reported which can be attributed to this product. There is no dust content in the product and any free fibres which may be present are not of respirable size. No protective clothing or gloves are required when installing AngelStep.

Test Reports

Acoustic Underlay

CONTENTS

LIGHT WEIGHT TIMBER CONSTRUCTION

- Timber joists + floating T & G timber hardwood showing an improvement of 17 - 19dB
  AngelStep *484P*

CONCRETE SLAB

- 180mm concrete slab and cavity ceiling (results up to the maximum 6 Stars)
  AngelStep *48P* & AngelStep *484P*
- Concrete slab no cavity ceiling
  AngelStep *SQ6*
- 180mm concrete slab and a cavity ceiling (results up to the maximum 6 Stars)
  AngelStep *SQ6* & AngelStep *8*
- 170mm concrete slab, no cavity ceiling
  AngelStep *GOLD 8* & AngelStep *GOLD 4*