ELS

Turn on the Light
Turn down the Sound

FUSE

01 2023 RANGE

Australian made like nothing ELSe.

The famous Australian Made, Australian Grown (AMAG) logo is the true mark of Aussie authenticity. It's Australia's most trusted, recognised and widely used country of origin symbol, and is underpinned by a third-party accreditation system which ensures products that carry the logo are certified as 'genuinely Australian'.

Efficient Lighting Systems is proud to have the strong backing of the Australian Made campaign across all FUSE Product Ranges.

Our commitment to designing and building luminaires that last.

Efficient Lighting Systems understands the importance of creating sustainable, quality luminaires that are built to last. This commitment to designing and producing quality luminaires is controlled through the use of the highest quality components and our strict quality control processes from design through to delivery.

This commitment ensures our luminaires are built to last and this is why we back this claim with a 7 year warranty for all Product Ranges. Our specialty extended 10 year warranty is offered on an individual project basis, upon assessment.

Durability like nothing ELSe.

FUSE

Fusing together exceptional lighting and sound absorption.

At ELS we believe that acoustic comfort and quality lighting are essential components of healthy spaces. Studies have shown that light and room acoustics have an undeniable impact on productivity, human interaction, and wellbeing. With this front of mind, we have developed FUSE - a unique range of pendant luminaires where light and sound work in harmony.

Designed in Australia, the FUSE range takes its inspiration from the circular form and structural integrity of the Wandiligong Maze. FUSE combines form and function to enhance work-spaces, while visually and acoustically creating a distraction -free, productive and comfortable environment.

Our commitment to sustainable manufacturing.

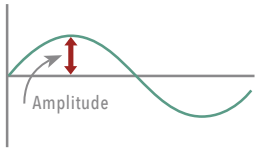
Environmentally conscious from concept through to manufacture and beyond our driving force is to design luminaires first and foremost for longevity. Looking to principles of circularity, we optimise all the resources at our disposal to reduce our consumption not only during design and manufacture but also at end of life. When considering the luminaire life cycle and how we tackle end of life, we ensure wherever possible that materials can be reused or recycled. Partnering with local Australian manufacturers of raw materials ensures our footprint is further reduced while supporting our local economy.

The FUSE products are no different in their design and manufacture approach. The acoustic material is manufactured in Australia from 60% post consumer recycled PET and at end of life the material can be recycled into a third life product.

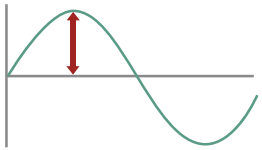
The science of soundwaves.

Sound has both volume and pitch. Volume is seen as an increase in amplitude of the sound wave. Pitch is seen as a change in the frequency of the sound wave.

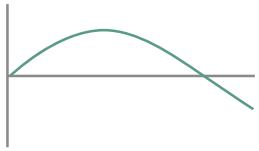
Reverberation is the multiple reflections of sound waves within a space. Sound reverberation as described in the standard is the time it takes for a sound to decay by 60 decibels within an occupied interior space. As an example if a reverberation time is 1 second this means it takes 1 second for a sound to decay by 60 decibels, thus allowing the sound to bounce around the space for that period of time and become distracting or uncomfortable for the occupants. It is therefore advantageous to have a low reverberation time within a space to ensure healthy, comfortable and productive conditions.



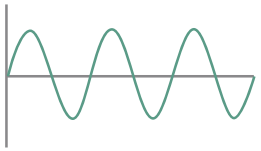
Quieter



Louder



Lower pitch



Higher pitch

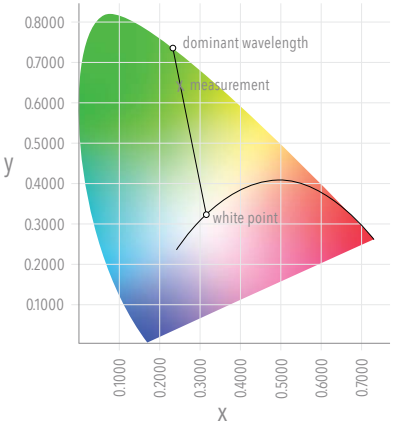
The advantages of reducing sound reverberation.

Poor sound quality can have negative effects on concentration, information retention and even mood. In certain environments this is exceptionally important such as schools, workplaces and some health and medical facilities.

Research suggests that there is a direct correlation between the acoustic environment of a learning space and the academic and social achievements of children, particularly so in special needs environments. This is backed by many governing bodies including the WELL Standard that has specific recommendations around sound reducing surfaces and reverberation. It ensures spaces are designed in accordance with comfortable times of reverberation which support speech intelligibility, vocal effort and are conducive to concentration. AS/NZS 2107:2016 also specifies reverberation times for various spaces, assisting designers in achieving the best possible acoustic outcomes for their interiors.

The FUSE Range has been designed to enhance the acoustic performance of a space when used in conjunction with other materials. The form and shape of the FUSE has been specifically designed to not only absorb sound but also capture sound.

LIGHTING TERMINOLOGY



The PLANCKIAN Black Body Locus is a diagrammatic representation of a black body radiator's emission with respect to the color temperature.

Not all lighting is created equal.

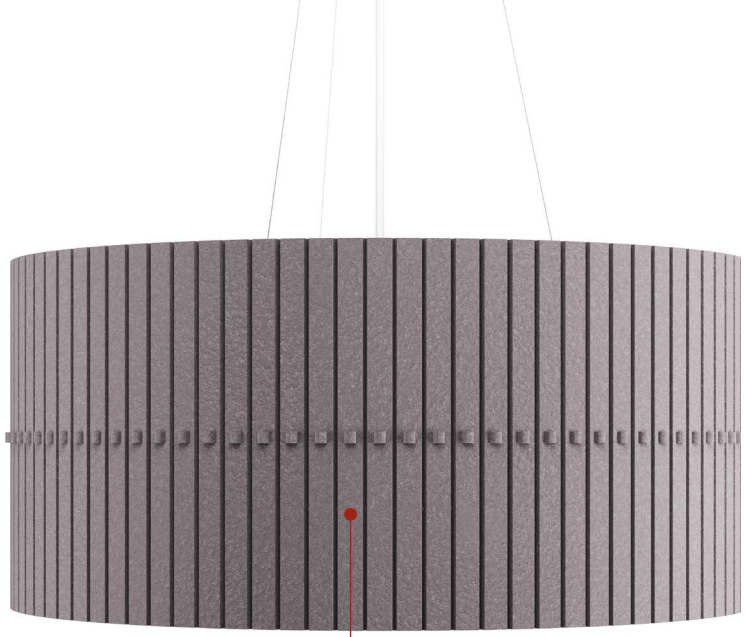
When you choosing the right luminaire for a space there are many things to consider. Energy efficiency, colour temperature, colour rendering, colour shift, flicker and product life are all important factors to be aware of.

COLOUR TEMPERATURE (CCT) measured in Kelvin (K) refers to how warm or cool the colour temperature of the light is - 2700K indicated a warmer colour whereas 5000K represents a very cool colour. Colour temperature has for years been used to influence the feeling of a space but it also must be noted that colour temperature has a dramatic effect on the appearance of other colours and finishes in a space. THE COLOUR RENDERING index of a lightsource also needs to be considered. Colour rendering index or CRI for short measures how faithfully a light source renders specific reference colours compared to how those colours are rendered by a natural light source. If each colour point is reproduced identically to the reference, then the CRI is 100. Industry standard recommends a CRI of at least 90 to ensure that colours, textures and surfaces are correctly represented under artificial light.

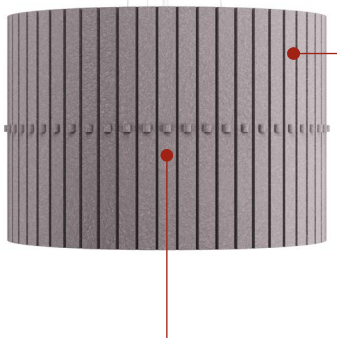
COLOUR SHIFT is an issue that occurs with lightsources whereby the light moves off the black body locus and results in the light degrading over time and shifting colour. In worst case scenarios this can been seen as either a pink or green tinge to the light as a result of the light moving off the black body locus and into the pink or green field. Colour consistency is evaluated in terms of MacAdam ellipses in relation to the Black Body Locus. It literally refers to how many ellipses off the Black Body Locus has occurred from the original point, measured either along or to to the side of the Locus. This is measured as Standard Deviation Color Matching (SDCM), with higher SDCM representing proportionately greater, more recognisable difference in colour. Industry standard suggests a 3-Step SDCM shift or less is best practice as this ensures that any colour shift that occurs over the life of a luminaire is not visible to the human eye.

STROBOSCOPIC EFFECTS or more commonly known as flicker which is the rapid variation in output of a lamp over time. Seemingly unaware, our brain filters or flickers out and provides a stable view of our environment. However, when lights flicker the image processors in our brain begin to get confused, resulting in eyestrain and fatigue over prolonger periods. To assist in combating the negative effects from light flicker recommended standards have been introduced based on research and studies. Ref: IEEE Std 1789-2015. It is important to ensure drivers supplied with LED luminaires comply with this standard.

RELIABILITY & LIFETIME Beneath other beneficial characteristics, LEDs provide a high reliability. A lifetime of more than 50,000hrs can be easily reached, however poor manufacturing, unfavourable luminaire design and operational conditions will reduce the reliability. LED reliability terminology can seem cryptic to those not directly involved in LED manufacturing. We believe at least a 70,000h L80B10 rating should be quoted when referring to reliability metrics - this shows a true figure for a commercial application whereby luminaires may be running 14 hours a day, 365days a year and would account for a 13 year commitment to an installation that no more that 10% of luminaires will be under 80% of their original output after 13 years, ensuring the original lighting designs still comply and the degradation is not visible to the human eye.

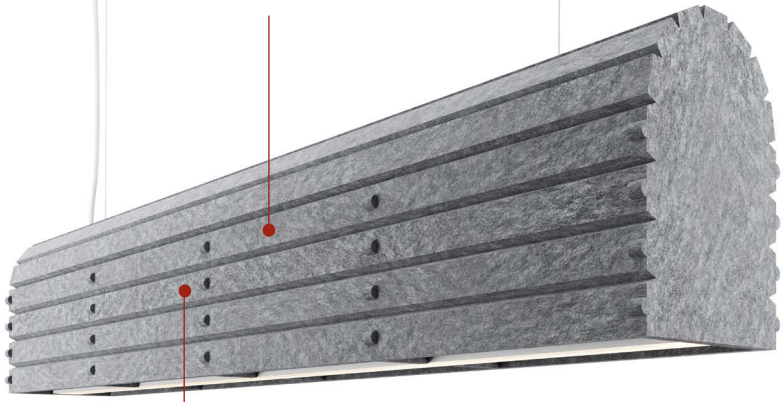


01 Available in 32 colour finishes



02 FUSE Round
available in 3 sizes

03 Acoustic cover made from PET,
60% being post consumer
recycled PET



04 FUSE Linear available in 4 heights,
2 widths and fully customisable length

FEATURES

01 CONSTRUCTION

- Made in Australia
- Available in either round or linear style
- FUSE Round available in 3 sizes
- FUSE Linear available in 4 heights, 2 widths and fully customisable length
- Acoustic cover made from PET, 60% being post consumer recycled PET
- Acoustic cover is Grade 1 fire rated
- Available in 32 colour finishes

02 LED PERFORMANCE

- Exceptional LED performance up to 107 lm/w
- Available in 3000K, 4000K or white tunable
- L80B10 @ 70,000h
- 90+ CRI
- 3 SDCM

03 CONTROL GEAR

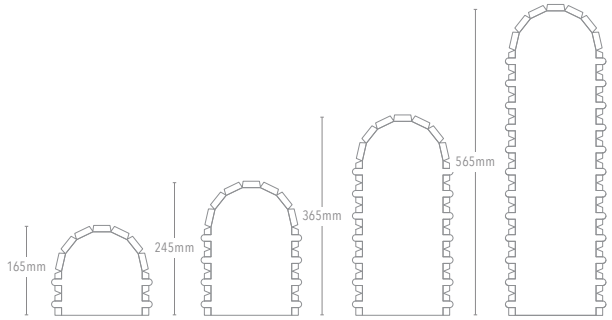
- Fully integrated control gear
- Available as DALI or wireless Casambi controlled
- Dynamic RGBW and Pixel colour illumination available in linear version
- New Variable Output Technology (VOT) gives the opportunity to optimise exact project requirements for non-dimmable, DALI and Casambi versions

CUSTOMISATION

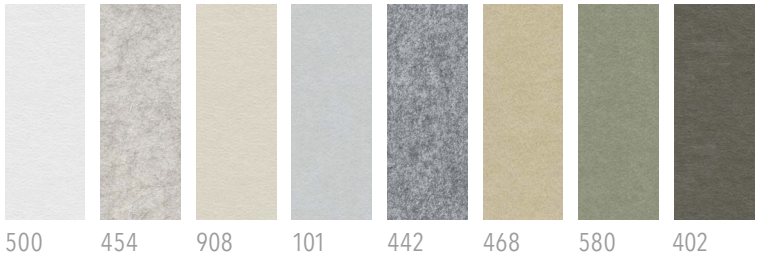
Over 10,000 possible design combinations.

With 32 colours available across two design styles and 11 sizes the FUSE range is exceptionally customisable.

Opening the door to truly individual design outcomes ensures each and every project can meet it's full potential from a lighting, acoustic and aesthetic standpoint without any compromise.



FUSE LINEAR 170MM WIDE / HEIGHT OPTIONS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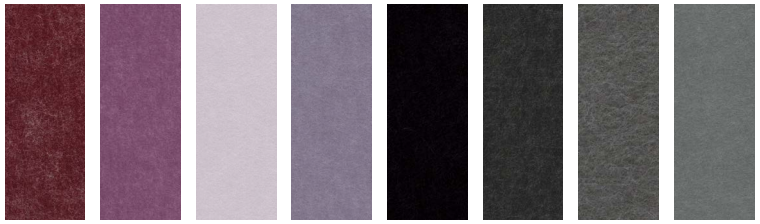

269 576 274 276 550 542 447 444


487 193 167 295 381 579 660


633 551 330 338 349 384 365

NOT SUPPLIED

Variable Output Technology.

All versions of the FUSE Range are available with Variable Output Technology (VOT). This provides maximum flexibility and offers the opportunity to optimise exact project requirements and overall power usage of the lighting solution provided.

An array of standard outputs are catalogued however the ability to tune the luminaire to exact requirement is also available. Outputs are preset at the factory and IES files can be provided to ensure lighting designs are accurate.

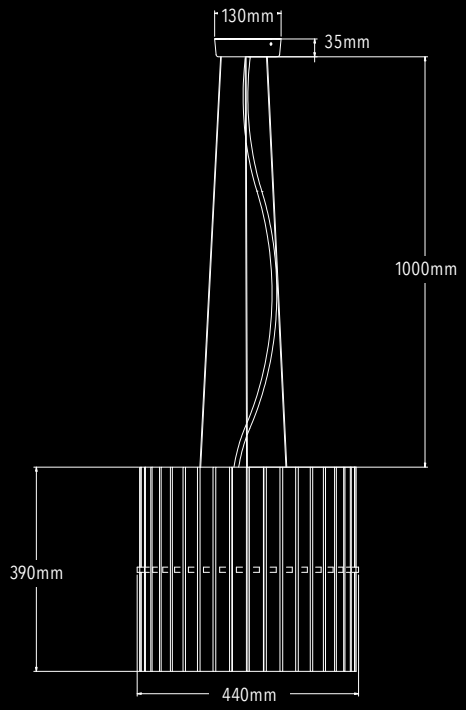
FUSE

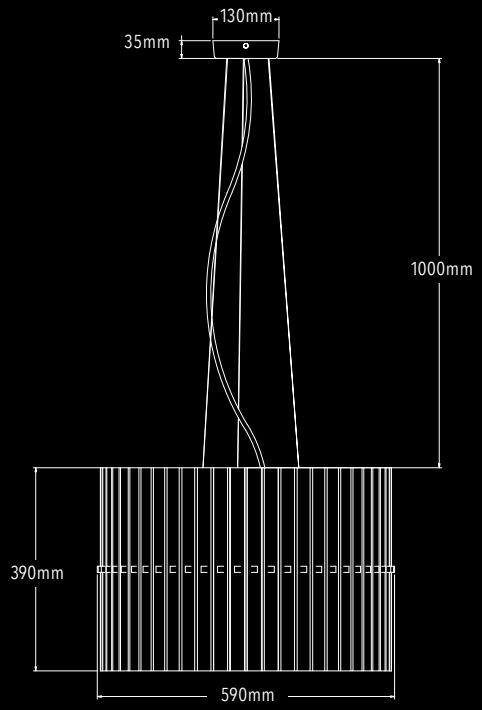
Engineered Optics like nothing ELSe.

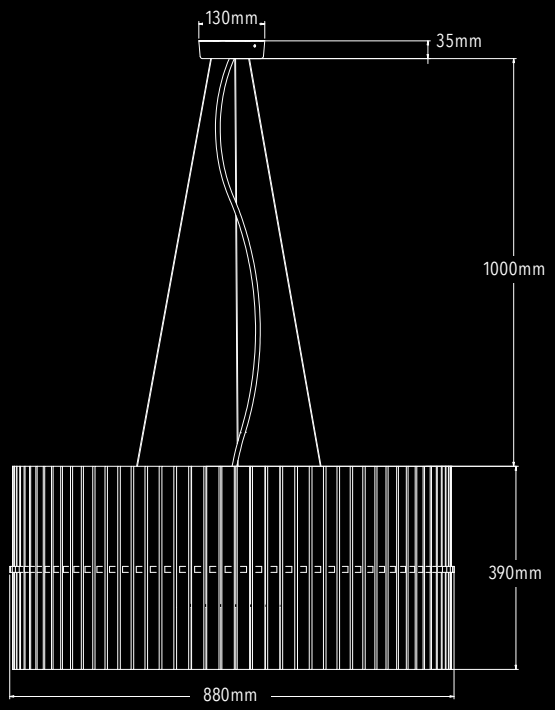
As LEDs have become more powerful over time glare from light sources has become an issue that requires careful consideration during luminaire design. The FUSE Range utilises a number of solutions to ensure performance and low glare illumination can be achieved.

The FUSE Round utilises state of the art diffuser materials created specifically for even LED illumination. A considered approach to the luminaire design ensured the diffuser is set back for the exact requirements of achieving wide beam general illumination while providing the best possible outcome for visualcomfort.

The FUSE Linear offers both a dual optical system for exceptional cutoff and glare control or alternatively a diffused option where wide spacing and visual comfort are important.







FUSE ROUND

FUSE Round 440

Variable Output
20W / 1835lm - 40W / 3486lm

- 3000K 90+CRI
- 4000K 90+CRI

ND Non dimmable
DALI dimmable
CASAMBI dimmable

32 Colours (refer p14)

FUSE Round 590

Variable Output
47W / 4732lm - 80W / 8186lm

- 3000K 90+CRI
- 4000K 90+CRI

ND Non dimmable
DALI dimmable
CASAMBI dimmable

32 Colours (refer p14)

FUSE Round 880

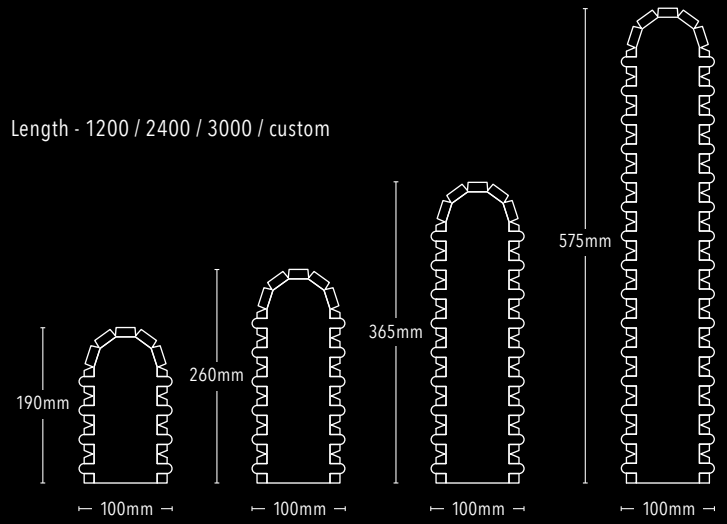
Variable Output
92W / 9345lm - 155W / 16125lm

- 3000K 90+CRI
- 4000K 90+CRI

ND Non dimmable
DALI dimmable
CASAMBI dimmable

32 Colours (refer p14)

FUSE LINEAR 100



Luminaire Engine UD45

Variable Output
16W / 1828lm – 25W / 3117lm

Divisible by 280mm

- 3000K 90CRI
- 4000K 90CRI
- TW 2700K-6500K 90CRI
- RGBW

- Flat diffuser
- Dual optic

- 65˚ Beam
- 80˚ Beam
- Asymmetric

- White louvre
- Black louvre

- **ND** Non dimmable
- DALI dimmable
- CASAMBI dimmable

Luminaire Engine UD50

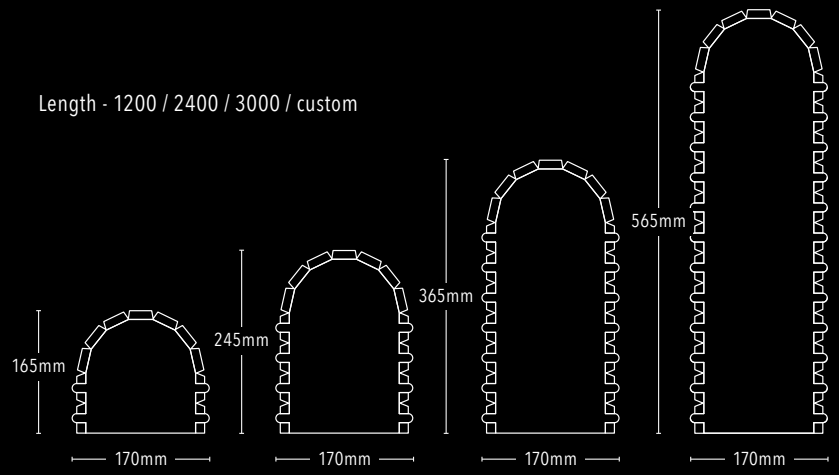
Variable Output
9W / 827lm – 30W / 3510lm

Divisible by 140mm

- 2700K 90CRI
- 3000K 90CRI
- 3500K 90CRI
- 4000K 90CRI
- TW 2700K-6500K 90CRI
- RGBW

- Flat diffuser
- U diffuser

- **ND** Non dimmable
- DALI dimmable
- CASAMBI dimmable



Luminaire Engine UD45

Variable Output
16W / 1828lm – 25W / 3117lm

Divisible by 280mm

- 3000K 90CRI
- 4000K 90CRI
- TW 2700K-6500K 90CRI
- RGBW

- Flat diffuser
- Dual optic

- 65˚ Beam
- 80˚ Beam
- Asymmetric

- White louvre
- Black louvre

- **ND** Non dimmable
- DALI dimmable
- CASAMBI dimmable

Luminaire Engine UD50

Variable Output
9W / 827lm – 30W / 3510lm

Divisible by 140mm

- 2700K 90CRI
- 3000K 90CRI
- 3500K 90CRI
- 4000K 90CRI
- TW 2700K-6500K 90CRI
- RGBW

- Flat diffuser
- U diffuser

- **ND** Non dimmable
- DALI dimmable
- CASAMBI dimmable

FUSE LINEAR 170

CASE STUDY

FUSE Round

Product	FSR800.300.93.66.345
System watts	92 W
Delivered lumen output	9345 lm
Luminaire efficacy	101 lm/W
Colour deviation	3 SDCM
Colour rendition index	>90
Correlated colour temperature	3000K
Lumen maintenance	L80B10 72,000hours

Room Type	Meeting Room
Room size	5 x 4 x 2.7m
Floors	Carpet
Ceiling and walls	Plasterboard
Target RT	0.7 (midpoint for recommended meeting room level, 0.6-0.8)
Before treatment	0.9
After treatment	0.7
Fittings required	3


MAEKAWA
FRANK


FRANK

CASE STUDY

FUSE Linear

Product	FSL.SK50.21.93.F.3600.66.
System watts	50 W
Delivered lumen output	5193 lm
Luminaire efficacy	103 lm/W
Colour deviation	3 SDCM
Colour rendition index	>90
Correlated colour temperature	3000K
Lumen maintenance	L80B10 72,000hours

Room Type	Meeting Room
Room size	5 x 4 x 2.7m
Floors	Carpet
Ceiling and walls	Plasterboard
Target RT	0.7 (midpoint for recommended meeting room level, 0.6-0.8)
Before treatment	0.9
After treatment	0.64
Fittings required	1 x 3600mm long

ELS

Australian made like nothing ELSe.

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