INSOL®

DAPPLE PERFORATED METAL

Introducing dapple

> ***More and more, so it seems to me, light is the beautifier of the building.***
>
> **Frank Lloyd Wright**

Developed by Insol, the experts in architectural screening and facades, dapple is an extraordinary range of perforated sheet metal.

Thoughtfully designed, each pattern showcases a choreography of light, performed by deep shadows and dancing sunlight.

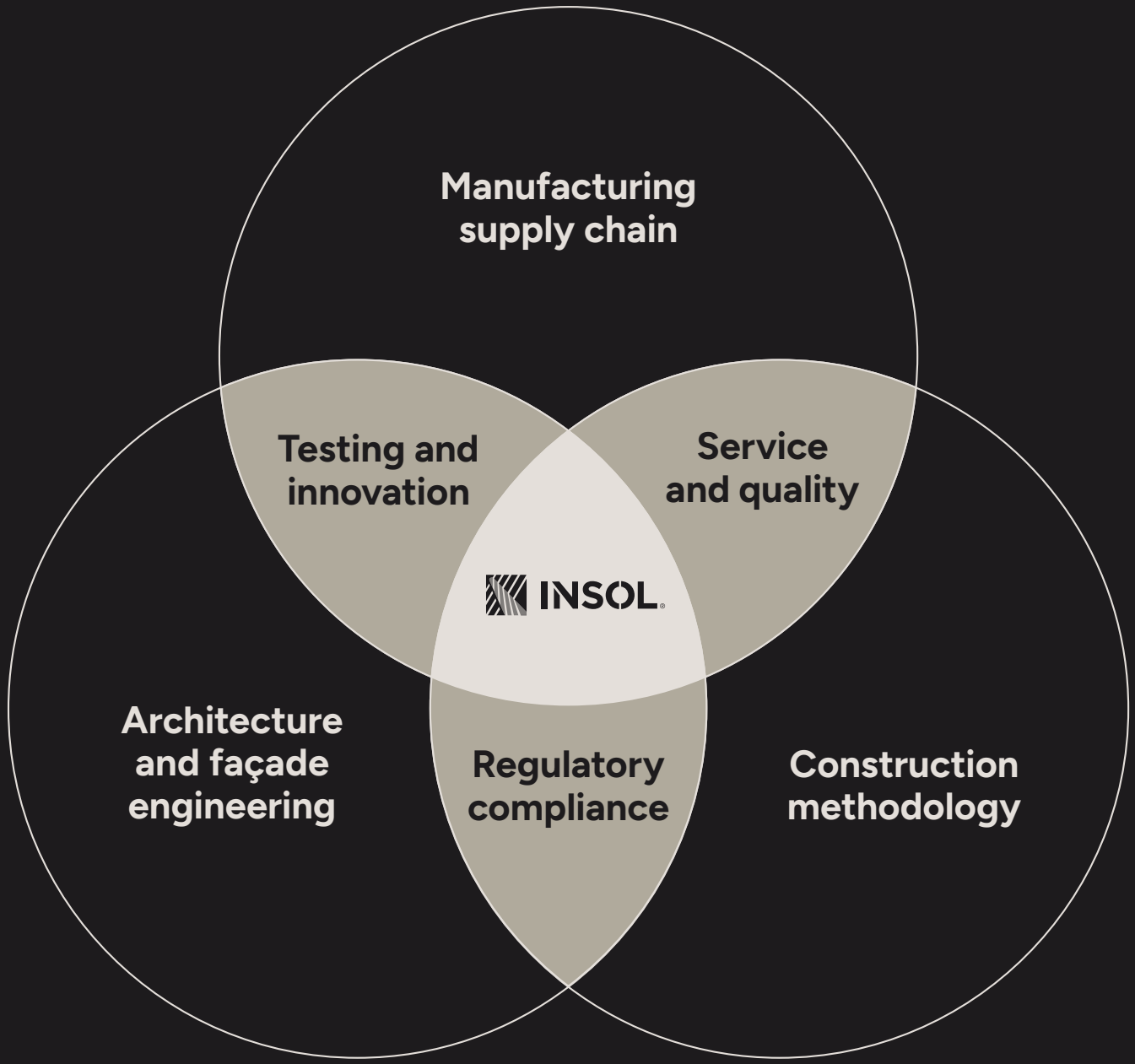
The effect is entrancing and ever-changing.

Insol is a family business with roots in the construction industry that date back more than 60 years.

In 2003 we started out with a vision of providing architectural louvre systems to high end commercial & residential projects. We were inspired by what was trending and developing internationally, brought what was happening abroad to our shores and adapted it to suit the NZ market.

Over the years our innovative, dynamic, and solution focused approach has lead to projects involving far more than just louvres. We are now completing large contracts as a full service provider of bespoke architectural facade enhancements.

Today we're proud to be a team of designers, engineers & project managers with a vast variety of skills and backgrounds. The large pool of technical knowledge and experience allows us to add significant value with design-build bespoke architectural facades. Our expertise in manufacturing and product design, coupled with our broad knowledge of architectural detailing and construction methodology brings solutions that are simpler, faster, and cost effective, while maintaining architectural intent.



It’s tested

Dapple is mostly used outside. Privacy screens. Sun screens. Or just architectural x-factor.

When it gets windy, some holes whistle. Not the simple whistling of a happy child but an annoying, penetrating whistle that causes you to grit your teeth.

We can tell you which holes whistle, when they whistle, and how loud. We can tell you where you should, or should not, put each pattern.

Dapple patterns are wind-tunnel tested in the Insol Facade Testing Laboratory. Each pattern is assigned a performance rating for your comfort and assurance.

Wind rating system

Everything makes noise in the wind.

It becomes a case of knowing how annoying the noise will be and how likely it is to happen. Our research has led to the development of a matrix which quantifies the risk of wind noise issues. It classifies the probability of noise and associated level of annoyance.

	Speed of wind gust			
Annoyance	**A** 108Km/h+	**B** 90-108Km/h	**C** 54-90Km/h	**D** 0-54Km/h
Unnoticeable above background noise	Low	Low	Low	Low
Tolerable above background noise	Low	Low	Medium	High
Irritating	Low	Medium	Medium	High
Intolerable	Medium	High	High	Extreme

Low	Very low risk of generating noise. Suitable for use over 10m high and around building edges.
Medium	Avoid using near building edges or anywhere there is free air flow through the screen. Seek advice before using over 10m height.
High	Do not use over 10m, near building edges, or anywhere there is free air flow through the screen. Seek advice regarding positioning.
Extreme	Ground level and interior use only.

WindLab

The consequences of product failure can be fatal.

This is why we have developed WindLab – our own facade testing laboratory, the only testing facility of it's type which can help mitigate risk by providing vital data to help us answer:

Is It safe? Can we break it?

We have been operating in this specialist field since 2003. As the complexities of screening have increased, going beyond publish guidelines and knowledge, there is a need for more scientific and analytical understanding.

Is it noisy?

Wind noise is difficult to predict. The acoustics of bespoke screening can be the cause of significant occupant discomfort and substantial financial cost to building owners, designers and contractors.

Why wind test?

Computational models have limitations and are unable to predict some serviceability issues, for example the likelihood of facade elements producing wind-induced noise or vibration. As the built environment rises in height and wind dynamics become more complicated in urban centres, wind testing becomes essential. Any project which includes perforated screens, sliding screens or certain louvre configurations, placed in high wind environments, should be wind tested in order to mitigate risk.

Our wind tunnel has an open jet, high power, short tunnel configuration. It's specifically designed to meet 1:1 scale building facade elements for structural integrity and wind noise. Able to generate flow velocities of up to 200km/h, variable speed controls over the 1.5 megawatt, 4 centrifugal fans allow maximum control of wind speeds which allow for low-speed acoustic testing as well as high-speed structural tests.

Dapple is the only range of perforated aluminium to be pre-tested for wind noise and able to satisfy the quality assurance requirements of the applicable test standard (AWES-QAM-2-2024). All products in the dapple range may be specified and used without the need for further wind-testing.

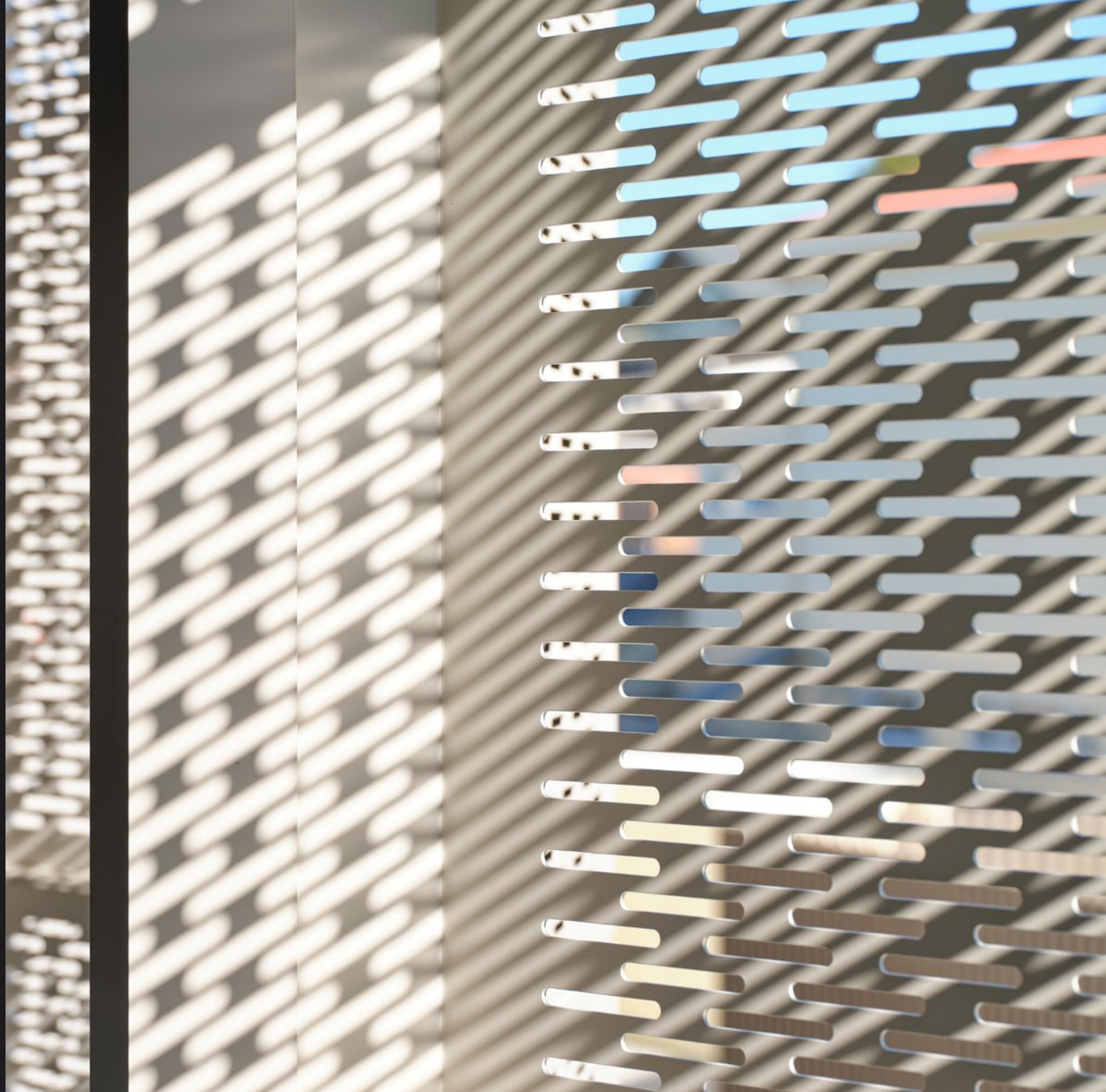
WindLab™

Dapple patterns

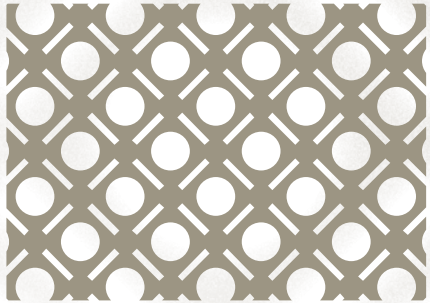
Variations in shape, open area and available finishes are offered in an extended and extraordinary range of perforated sheet metal.

Every pattern is designed, developed and wind tested by Insol in New Zealand.

If you can't see what you want here, just ask. We are continually developing and testing more patterns.



Mount Albert Grammer School, Auckland
Dapple "Dusk"

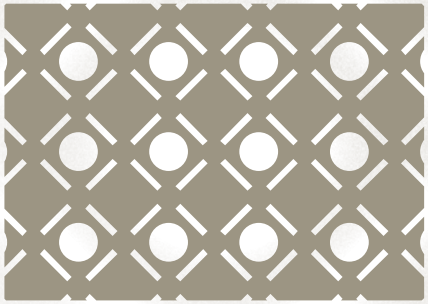


Daylight

Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	41.10%
Weight	4.81 kg/m^3 (0.30 lbs/ft^3)
Wind noise rating	Low risk

When printed on A4 paper, the background pattern appears at actual size

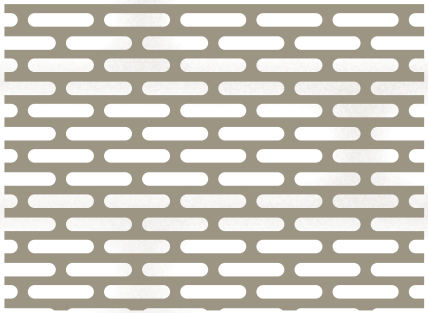


Twilight

Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	26.67%
Weight	5.96 kg/m^3 (0.37 lbs/ft^3)
Wind noise rating	Low risk

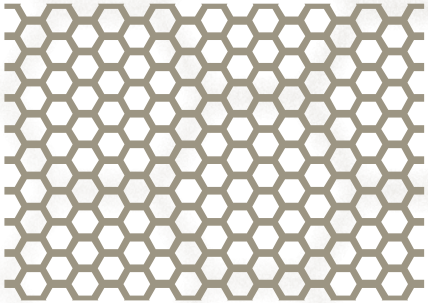
When printed on A4 paper, the background pattern appears at actual size



Dusk

Specifications

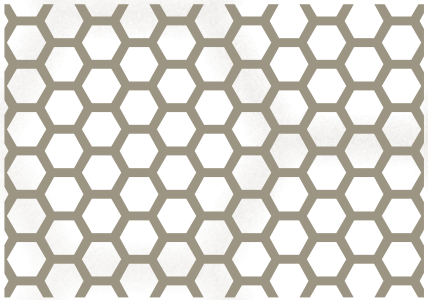
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	52.13%
Weight	4.12 kg/m^3 (0.26 lbs/ft^3)
Wind noise rating	Medium risk



Light Glow

Specifications

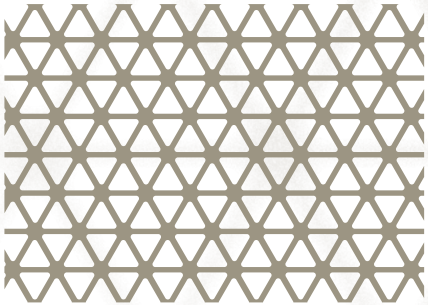
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	58.46%
Weight	3.38 kg/m^3 (0.21 lbs/ft^3)
Wind noise rating	Medium risk



Light Beam

Specifications

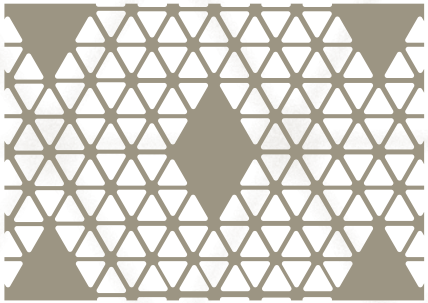
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	62.07%
Weight	3.08 kg/m^3 (0.19 lbs/ft^3)
Wind noise rating	Low risk



Lamp Light

Specifications

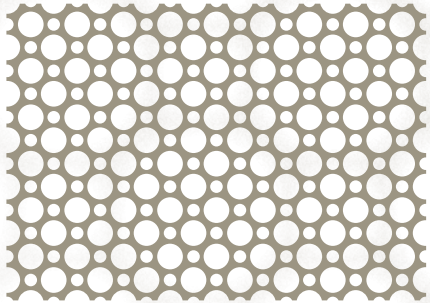
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	57.40%
Weight	3.46 kg/m^3 (0.22 lbs/ft^3)
Wind noise rating	Medium risk



Limelight

Specifications

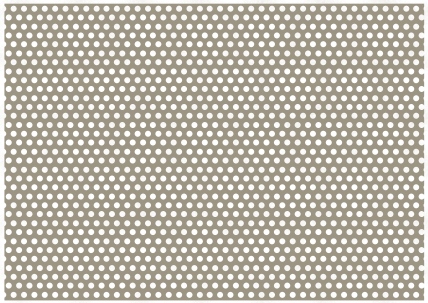
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	50.26%
Weight	4.04 kg/m^3 (0.25 lbs/ft^3)
Wind noise rating	Medium risk



Moonspell

Specifications

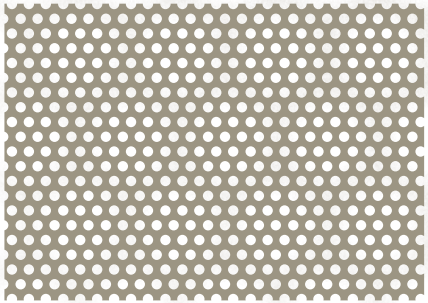
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	60.60%
Weight	5.67 kg/m^3 (0.35 lbs/ft^3)
Wind noise rating	Medium risk



Light Speck

Specifications

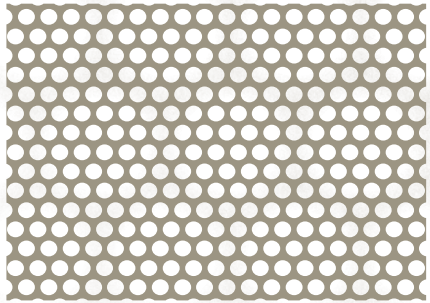
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	35.43%
Weight	5.64 kg/m^3 (0.35 lbs/ft^3)
Wind noise rating	Extreme risk



Light Touch

Specifications

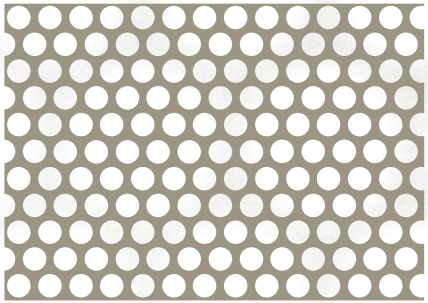
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	35.00%
Weight	5.67 kg/m^3 (0.35 lbs/ft^3)
Wind noise rating	Medium risk



Light Rain

Specifications

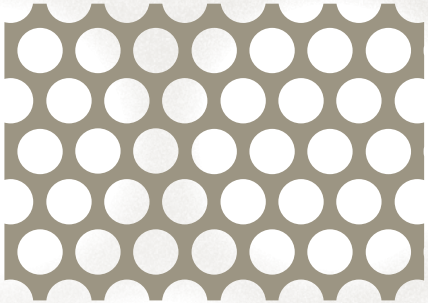
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	49.05%
Weight	4.68 kg/m^3 (0.29 lbs/ft^3)
Wind noise rating	Medium risk



Light Burst

Specifications

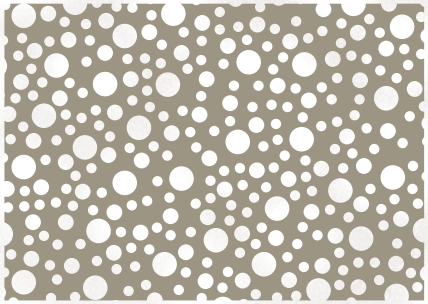
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	51.01%
Weight	4.54 kg/m^3 (0.28 lbs/ft^3)
Wind noise rating	Medium risk



Light Shade

Specifications

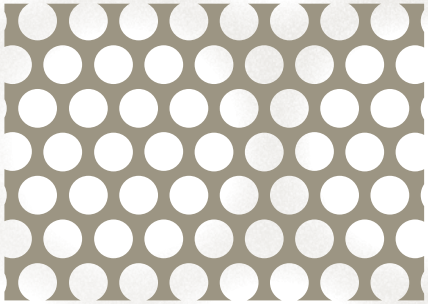
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	54.86%
Weight	4.27 kg/m^3 (0.27 lbs/ft^3)
Wind noise rating	Low risk



Moonscape

Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	30.20%
Weight	3.46 kg/m^3 (0.22 lbs/ft^3)
Wind noise rating	Low risk



Light Wash

Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	53.66%
Weight	4.35 kg/m^3 (0.27 lbs/ft^3)
Wind noise rating	Low risk

Spark

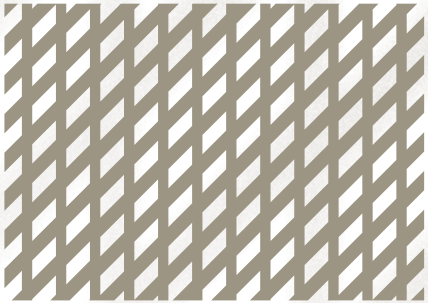
Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	44%
Weight	4.55 kg/m^3 (0.28 lbs/ft^3)
Wind noise rating	Low risk

Flash

Specifications

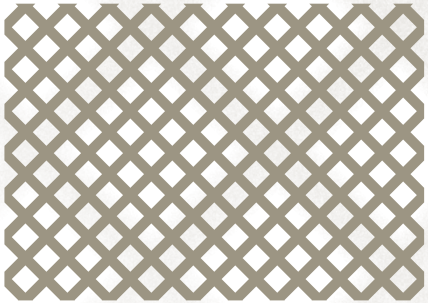
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	56%
Weight	3.58 kg/m^3 (0.22 lbs/ft^3)
Wind noise rating	Low risk



Ray

Specifications

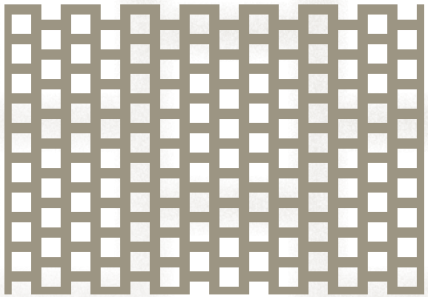
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	35%
Weight	3.58 kg/m^3 (0.33 lbs/ft^3)
Wind noise rating	High risk



Sunbeam

Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	42%
Weight	4.72 kg/m^3 (0.29 lbs/ft^3)
Wind noise rating	High risk



Beam

Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	43%
Weight	4.63 kg/m^3 (0.29 lbs/ft^3)
Wind noise rating	High risk

Gleam

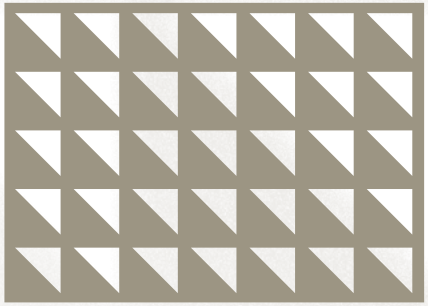
Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	40%
Weight	4.88 kg/m^3 (0.30 lbs/ft^3)
Wind noise rating	High risk

Glint

Specifications

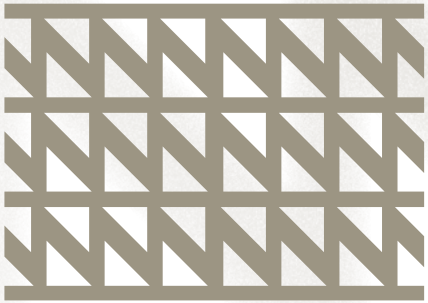
Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	36%
Weight	5.20 kg/m^3 (0.32 lbs/ft^3)
Wind noise rating	High risk



Candlelight

Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	31%
Weight	5.61 kg/m^3 (0.35 lbs/ft^3)
Wind noise rating	Low risk



Firelight

Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	38%
Weight	5.04 kg/m^3 (0.31 lbs/ft^3)
Wind noise rating	Medium risk

Customising dapple

The only limitation with dapple is your imagination.

We can work with you on a customised perforated design that is completely bespoke.

For a highly differentiated aesthetic, picture perf can be developed to produce recognizable, photograph-like images through a unique arrangement of hole size and density.

And of course, we can wind test and rate the custom pattern.

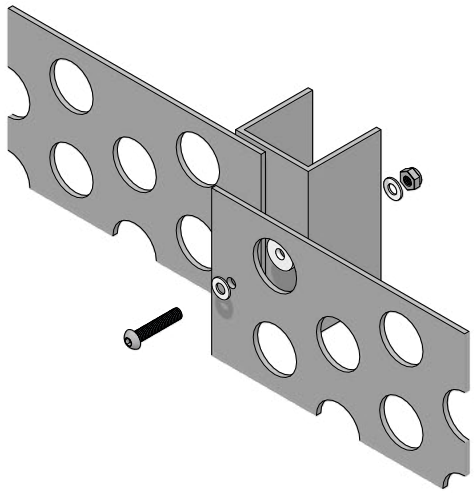
Elizebeth Street Apartments and Parking Garage, Tauranga
Dapple "Custom pic-perf"

Typical fixing details

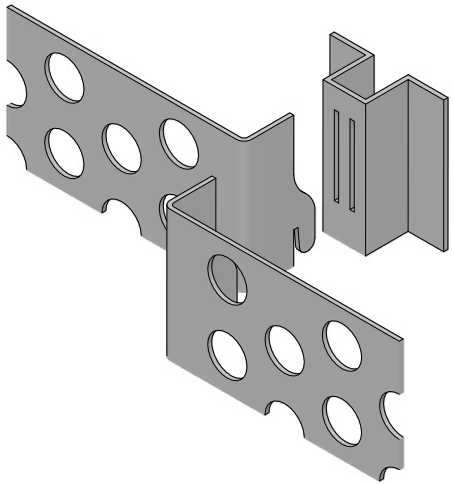
A standard range of fixing details provides discreet and lasting fixing for most uses, with varying degrees of concealment available.

For specific design requirements and to meet architectural intent, bespoke solutions can be developed and engineered, adapting dapple to any surface and placement.

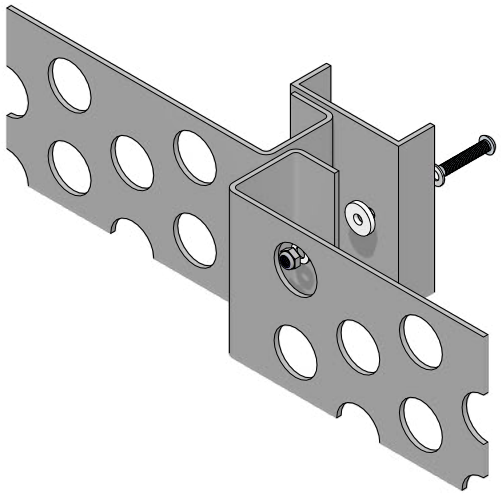
Genesis Energy, Hamilton
Dapple “Light Rain”



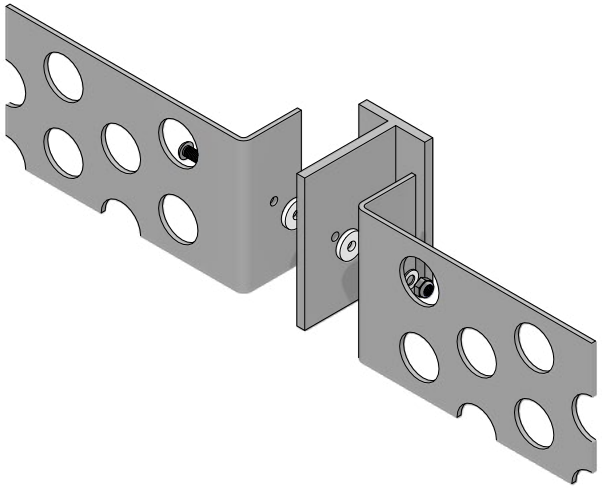
Face Fix



Hook and Rail



L Fold



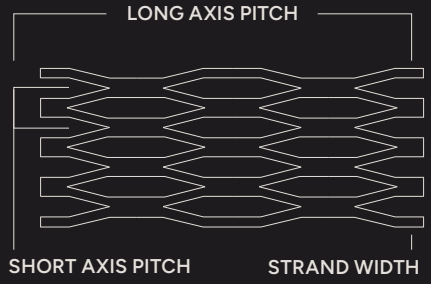
C Fold

Dapple textured patterns

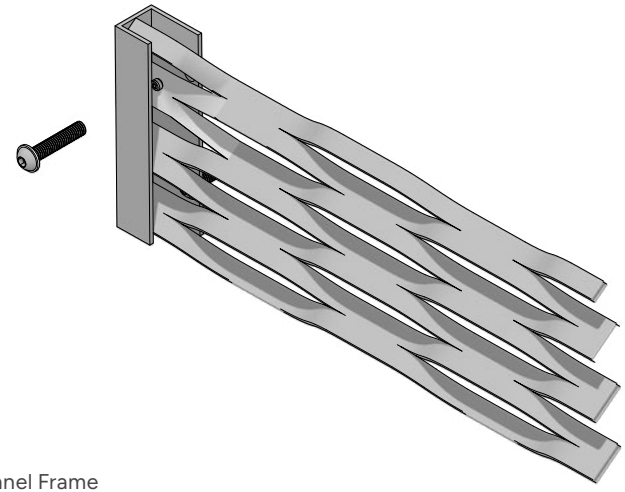
A distinctive woven, three-dimensional appearance for adding depth and texture.

Dapple textured patterns are created when sheet metal is slit and formed in one motion. No material is removed.

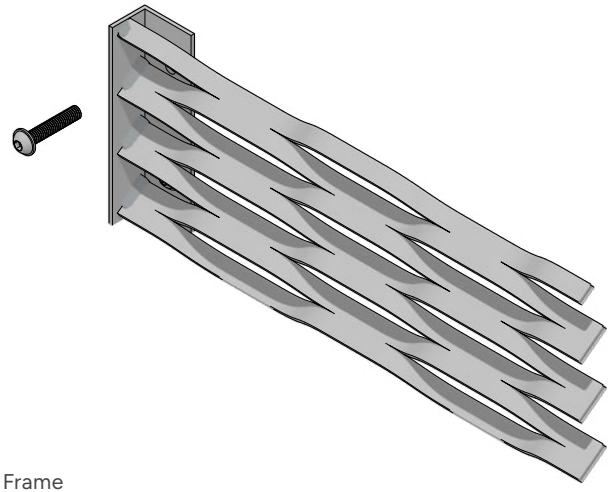
Every textured pattern is designed, developed and wind tested by Insol, in New Zealand.



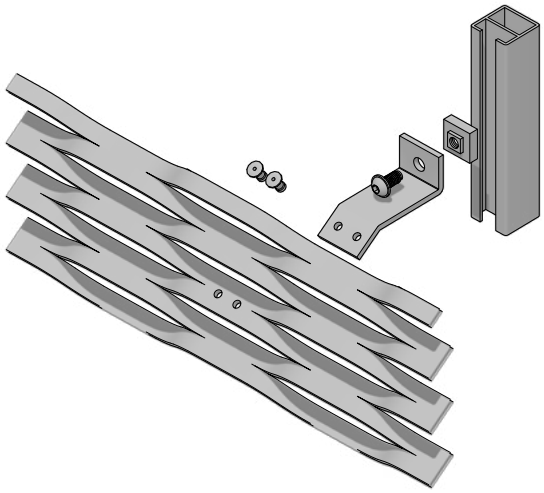
Hereford St Parking Garage, Christchurch
Dapple "Beacon"



Riveted Channel Frame



Welded Angle Frame



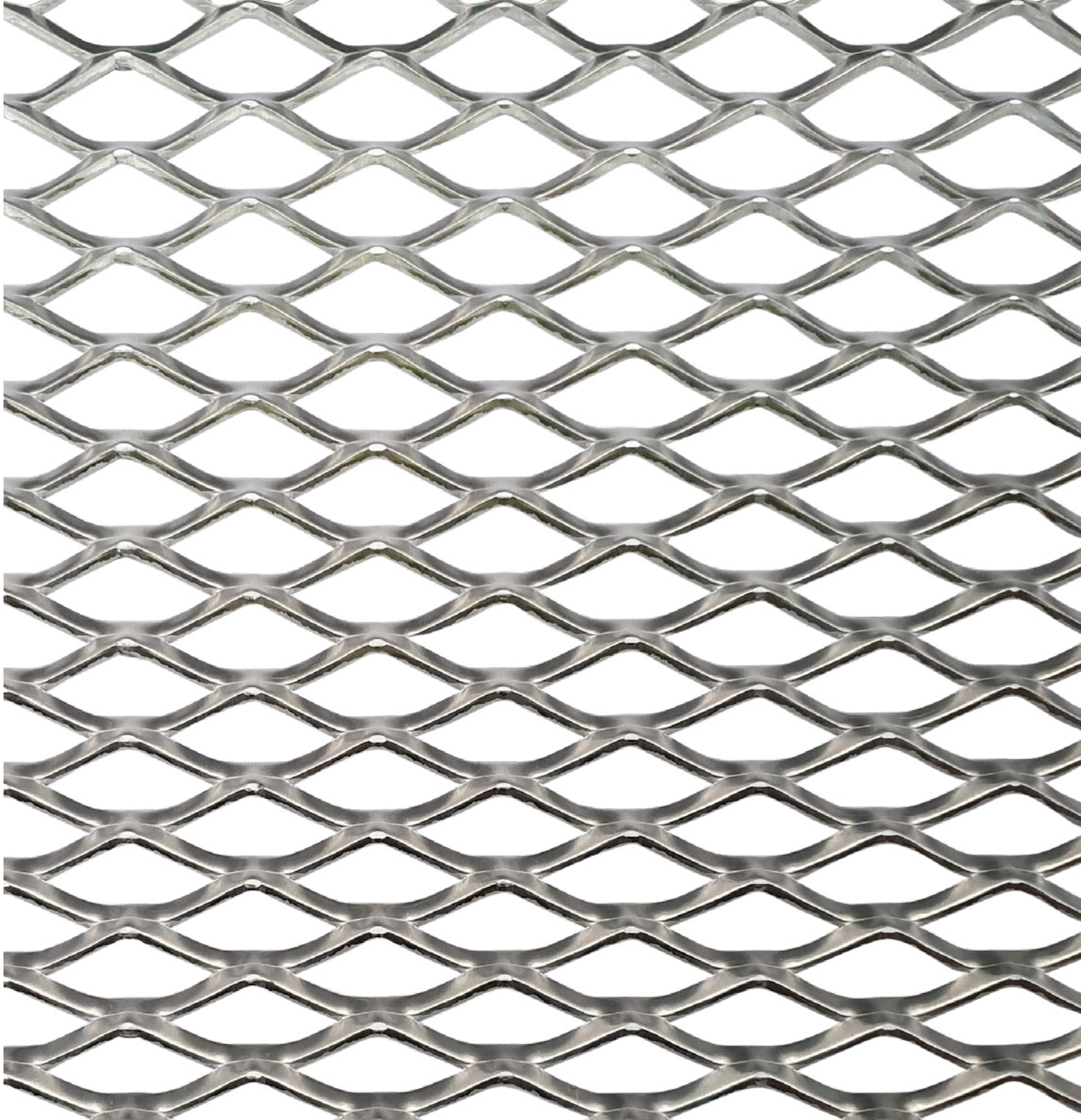
Clamp and Rail

Twinkle

Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	45.77%
Weight	4.07 kg/m^3 (0.25 lbs/ft^3)
Wind noise rating	Low risk
Short axis pitch	20
Long axis pitch	52
Strand width	5

When printed on A4 paper, the background pattern appears at actual size.

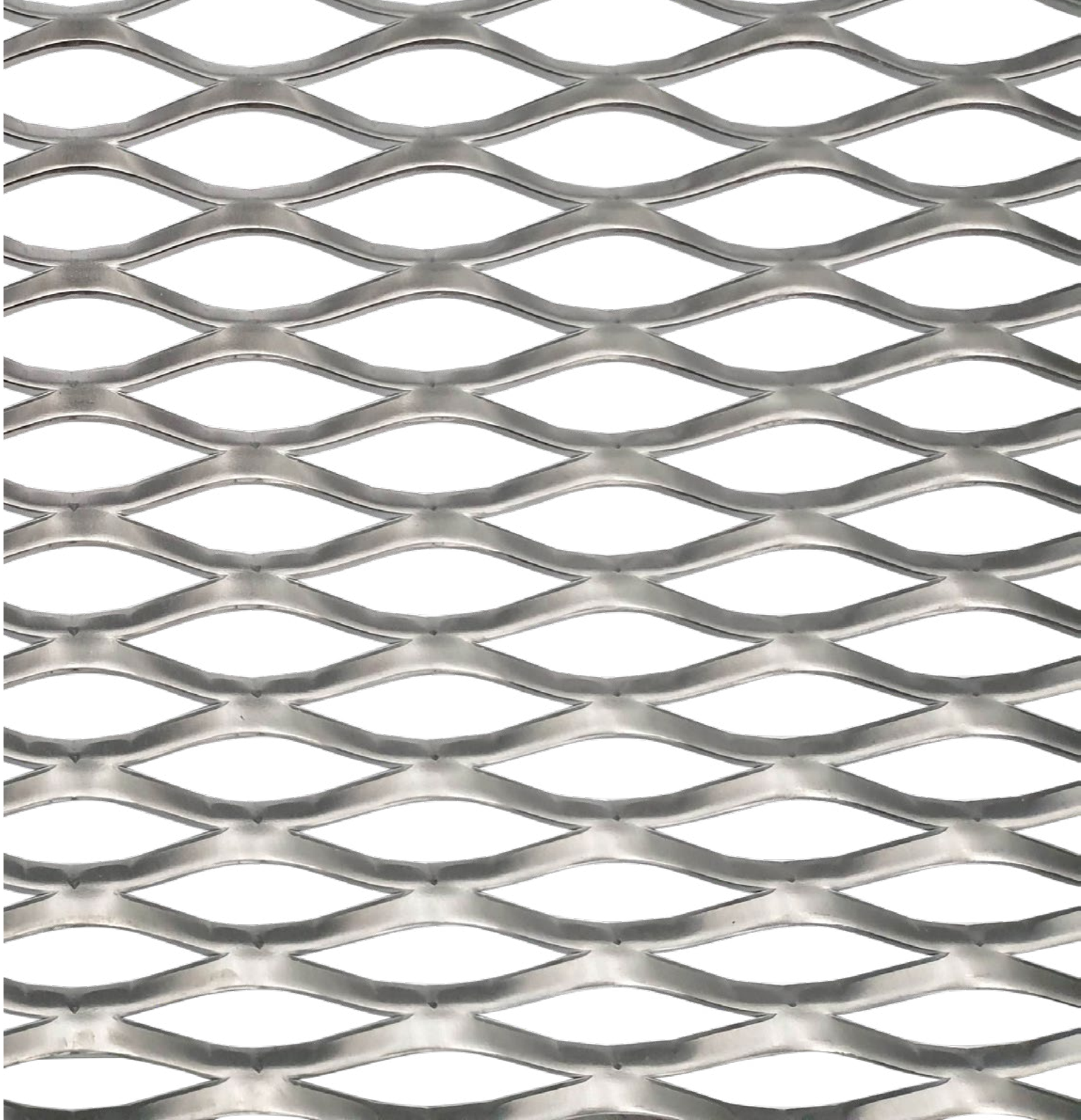


Sparkle

Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	47.95%
Weight	4.38 kg/m^3 (0.27 lbs/ft^3)
Wind noise rating	Low risk
Short axis pitch	26
Long axis pitch	75
Strand width	7

When printed on A4 paper, the background pattern appears at actual size.

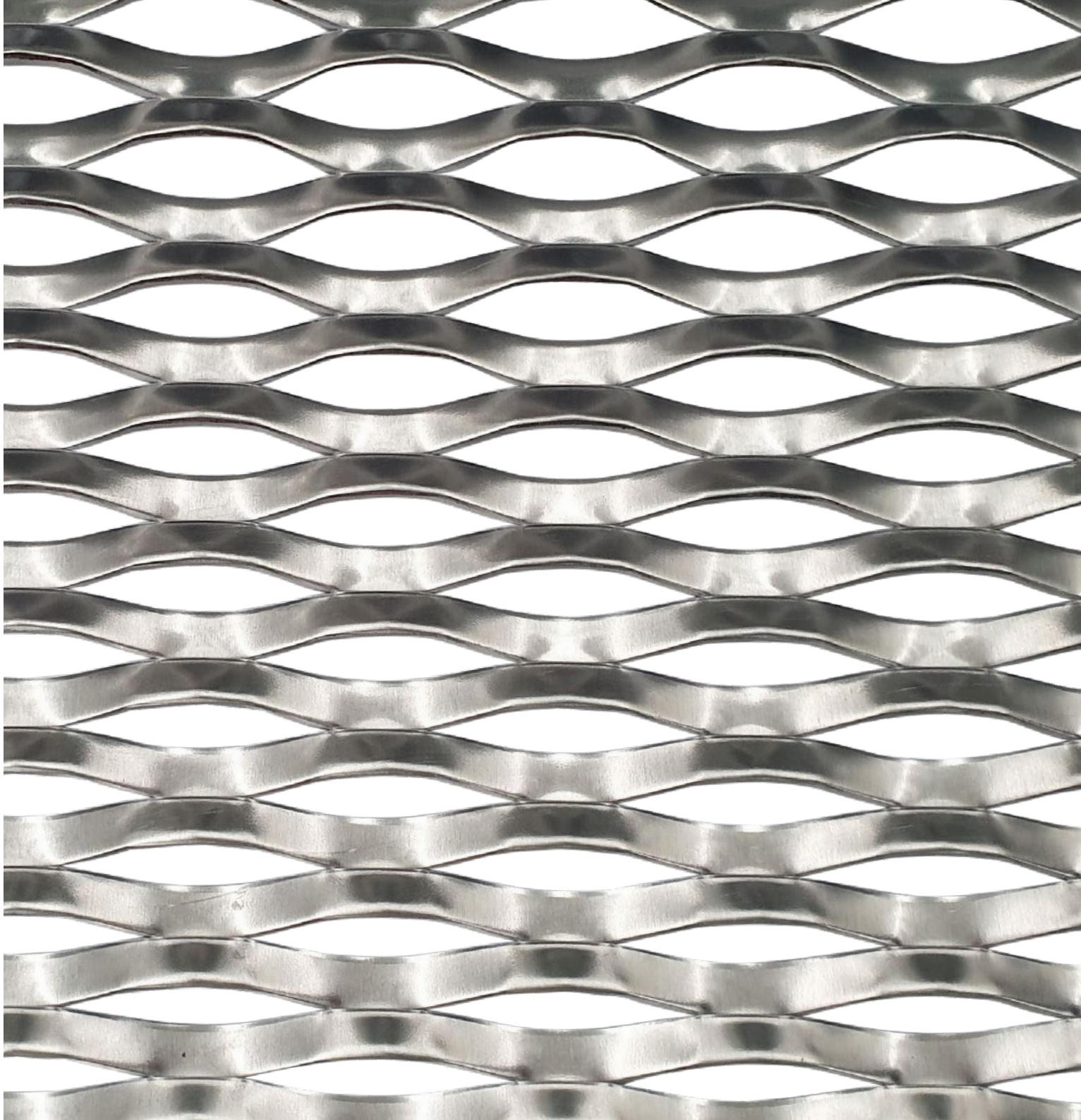


Gleam

Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	32.75%
Weight	5.71 kg/m^3 (0.36 lbs/ft^3)
Wind noise rating	Low risk
Short axis pitch	28.5
Long axis pitch	75
Strand width	10

When printed on A4 paper, the background pattern appears at actual size.

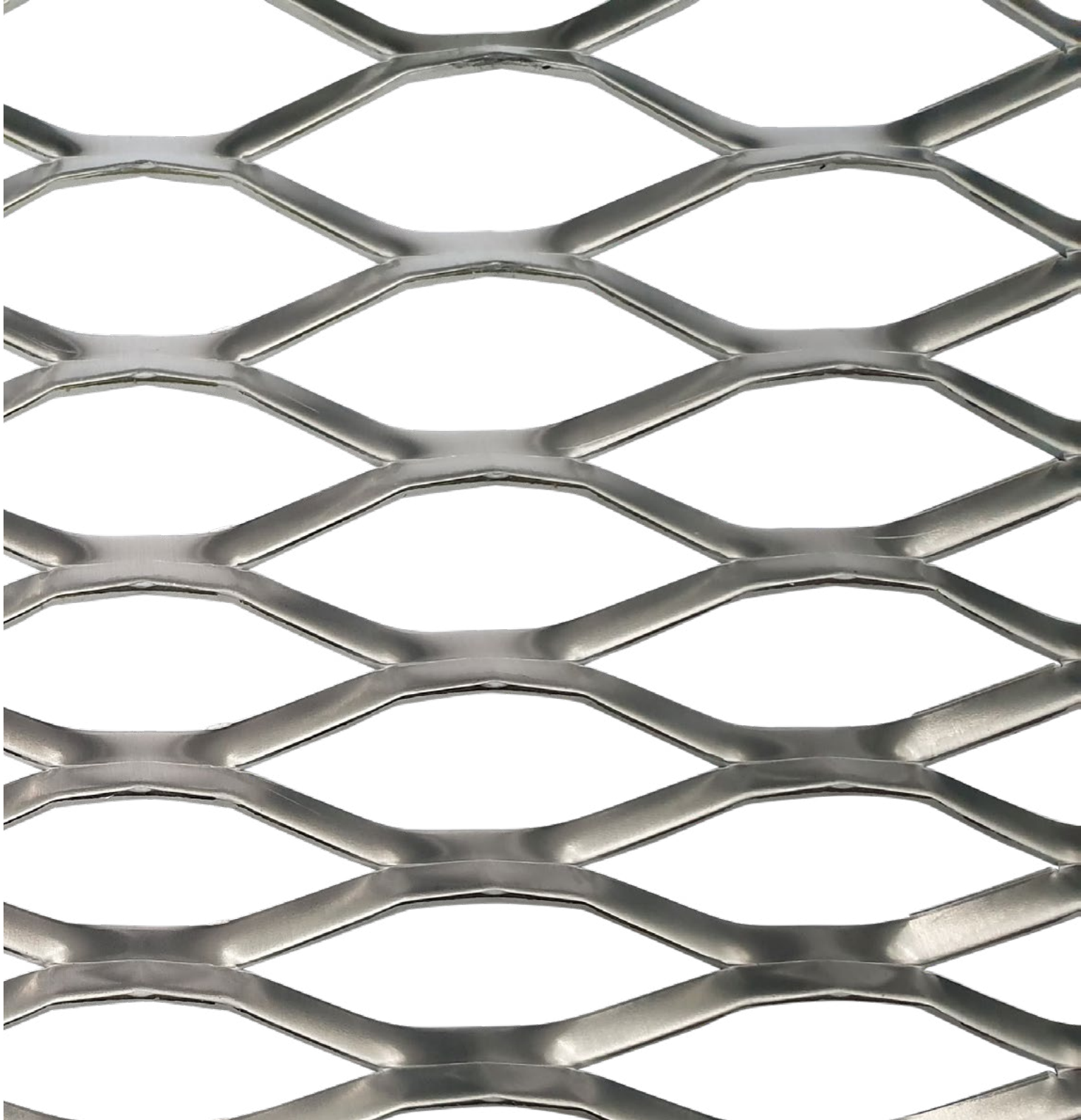


Shimmer

Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	71.16%
Weight	4.36 kg/m³ (0.27 lbs/ft³)
Wind noise rating	Low risk
Short axis pitch	41
Long axis pitch	136
Strand width	11

When printed on A4 paper, the background pattern appears at actual size.

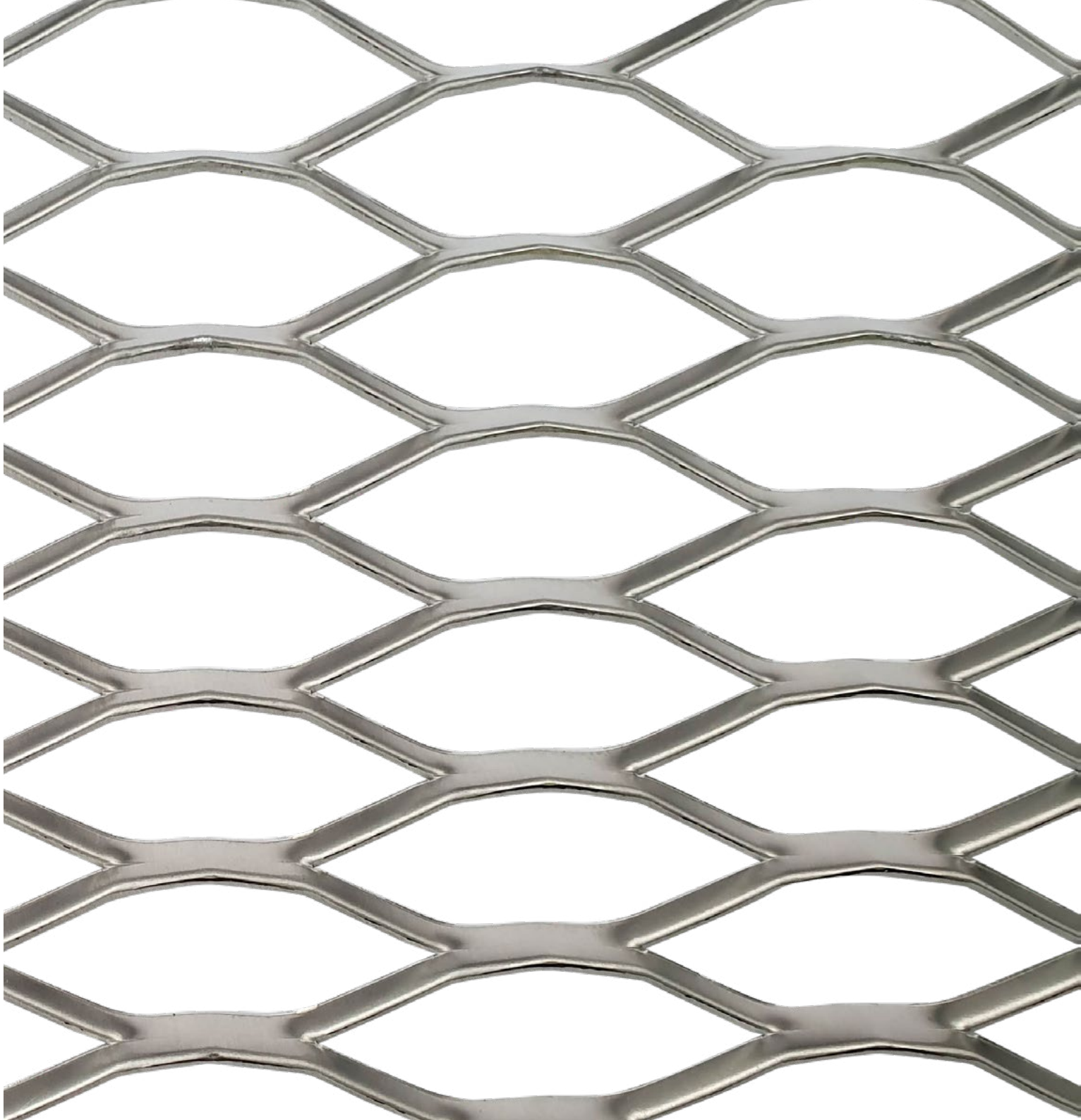


Beacon

Specifications

Material	3 mm (0.12″) 5005 grade Aluminium
Finishes available	Powdercoat or Anodised
Open area	75.12%
Weight	3.52 kg/m^3 (0.22 lbs/ft^3)
Wind noise rating	Low risk
Short axis pitch	37
Long axis pitch	136
Strand width	8

When printed on A4 paper, the background pattern appears at actual size.



CASE STUDIES

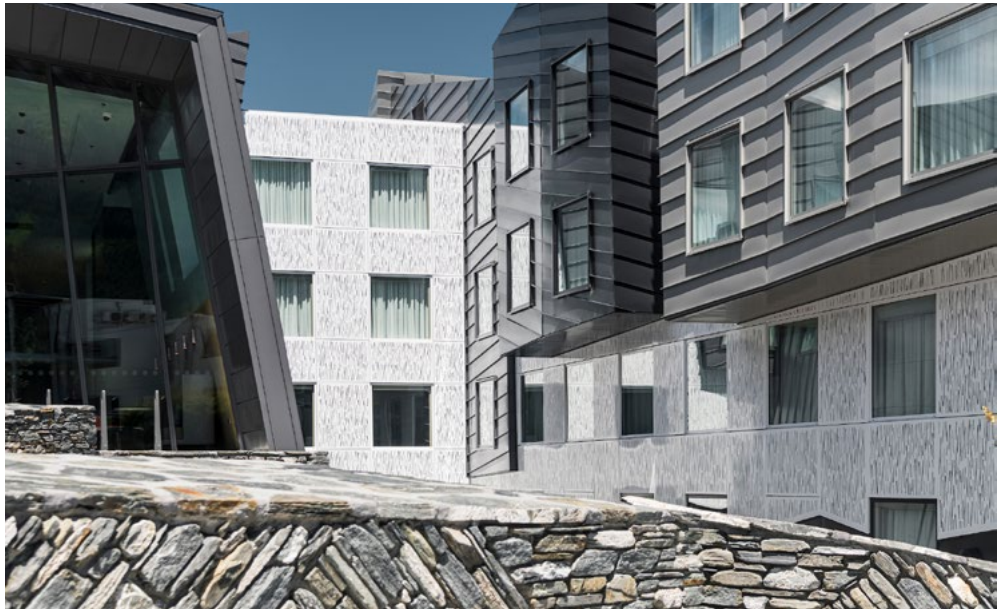
Holiday Inn Express

Location
Queenstown

Architect
McAuliffe Stevens

Contractor
Naylor Love

Customised dapple, consisting of both flat and textured panels act as a rainscreen whilst meeting architectural intent by covering the building in a glacier like appearance.



Lichfield Street Car Park

Location
Christchurch

Architect
MAP Architects

Construction
Clearwater Construction

Custom, aluminium diamond-shaped ‘scales’ combine with translucent red polycarbonate panels to produce moving shadows and light, adding an element of drama and capturing your attention.

Les Mills Car Park

Location
Auckland

Architect
Warren & Mahoney

Contractor
Leighs Construction

The project involved screening the entire carpark with a façade that was porous and had textural depth. The architectural intent involved a three dimensional diamond pattern that was perforated and interspersed with bronze tinted vision panels.

The initial designs involved a heavy three-dimensional structural steel frame with flat panels fixed to it. We were able to provide significant value engineering wins for the client by simplifying the structural steel frame and creating the three dimensional effect within the façade panels.

Further value was added by designing the structural steel subframe so that it would double as the vehicle barrier, and the façade to act as the fall arrest barrier.

Installation was carried out from the inside with the panels being winched down from the to deck level of the carpark.

The result was a distinctive building that looks different from almost every angle thanks to a unique 3-dimensional profile. By day, the landmark structure catches the eye. After sunset, it comes alive and sparkles, a glittering addition to Auckland's nightscape.


STREET CAR PARK

Auckland International Airport Transport Hub

Location
Auckland

Architect
Peddlethorp Architects

Contractor
ICON Construction

The design of the Transport Hub talks to a narrative of 'people will keep moving but the land will remain', referencing the cultural framework of the airport.

At the same time, the design has lines to reflect the ascent/descent of airplanes on the runways nearby. Featuring perforated metal in two different colours and perforation sizes (a custom version of Dapple "Dusk"), the facade extends to the concourse area on the southern side of the building, where they are joined by the large perforated fins that also feature on the office space.

In total, the Transport Hub has 8500m^2 of facade. That's a lot of perforated holes in an area located in a high wind zone, which is why comprehensive wind testing was completed at WindLab prior to design approval.


Auckland
Airport


Auckland
Airport

Ormiston Town Centre Parking Garage

Location
Ormiston, Auckland

Architect
Jasmax

Construction
Scarbro Construction

A custom variation of the Dapple "light shade" pattern was developed to carefully follow the contours of the parking ramp, powder coated in a striking burnt orange finish.

The dapple light accentuates the entrance and exit way as it snakes its way from inside to outside. Chosen for aesthetics and longevity, the dapple panels will continue shining the way for vehicles for years to come.


Ormiston
Town Centre
NEW WORLD
NW


Ormiston
Town Centre
Ent
P
OPEN
No Entry
thewarehouse
2
Hapori Lane

Toka Puia Parking Garage

Location
Takapuna, Auckland

Architect
Ignite Architects

Construction
Argon Construction

A golden mesh skin, stretched over an open frame, delivers both form and function, referencing the site's heritage as an industrial gas works.

In keeping with the original architectural intent, a dapple textured mesh with a custom pattern was developed, and panel modules prefabricated and raised into place via hoist.

It was a quick and straightforward installation methodology, unveiling the 3-dimensional quality of the diamonds in quick succession to passers-by. By meeting safety from falling regulations, the panels also serve an essential, functional purpose.

Sliding screens

Any project which includes operable screens (bifolding, pivoting or sliding) requires special attention to prevent the likelihood of serviceability issues including wind induced noise or structural failure.

With the assistance of Insol's wind testing facility, Insol has developed specific designed hardware developed for the latching requirements of complex screens in high risk locations, enabling the screens to be manually (or automatically) manipulated by occupants to provide the required levels of visual privacy, or to shade the interior as required.

Wellington City Mission, Wellington
Dapple "Custom pic-perf"

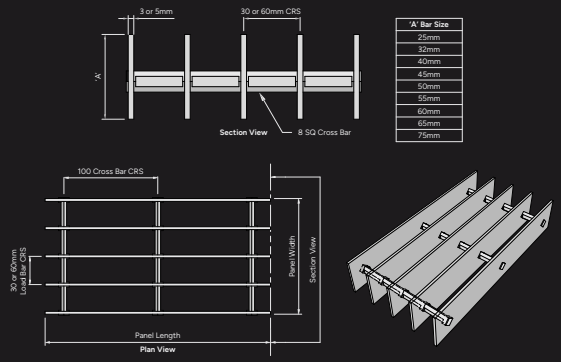
Azimuth™ grating

For a finishing flourish to compliment and complete the character of any building.

The Azimuth™ Grating System is the last word in versatility for aluminium sunscreening.

Available with a choice of several different louvre blade options or straight load bars, some variants of this system can withstand pedestrian loads. This means your sunscreening system can now double as a maintenance walkway. This system is available silver anodised in 12, 20 and 25 micron or powder-coated to the colour of your choice. With aluminium being a non-corrosive material, durability is assured.

The Azimuth™ Grating System is used widely as privacy screening or purely as an architectural feature to enhance the value of a building. Note that grating can be a high risk of aero-acoustic generated noise, and specialist advice (including wind tunnel testing if required) should be sought before specifying in high risk applications.



'A' Bar Size
25mm
32mm
40mm
45mm
50mm
55mm
60mm
65mm
75mm

Azimuth™ Grating, Queenstown

Louvre collection

We partner with architects, contractors, and developers by delivering confidence at every stage of the process.

The right louvres enhance and define the character of a building.

Then beyond the aesthetics, they deliver real benefits for solar control, screening and occupant comfort.

All louvre profiles are also tested in our Wind Tunnel. It's the ultimate quality control that only Insol can offer.

East Tamaki Multi-Storey Car Park, Auckland
Solaris Louvres

DAPPLE
PERFORATED METAL

Architecturally designed patterns
showcasing a choreography of light
performed by dancing sunlight and shadows

34 Onslow Street, Invercargill
03 216 3287 | enquiries@insol.co.nz

7 Waokauri Place, Auckland
09 276 9735 | enquiries@insol.co.nz