LYSAGHT

# LYSAGHT® SPANDEK OPTIMA™

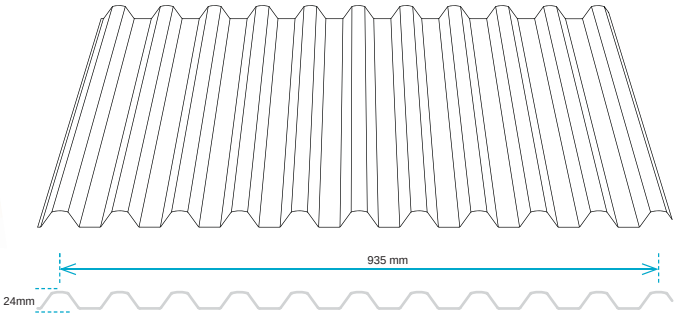
Trapezoidal Steel Cladding with Longer Spanning Capability

# LYSAGHT® SPANDEK OPTIMA™

LYSAGHT® SPANDEK OPTIMA™ is a contemporary-looking, trapezoidal profile which is ideal where a stronger, bolder, more modern corrugated appearance is required.

LYSAGHT® SPANDEK OPTIMA™ was originally designed as a strong attractive roofing material for industrial and commercial construction - however SPANDEK OPTIMA™ has proved equally popular for homes and public buildings, underlining its versatility and pleasing appearance.

LYSAGHT® SPANDEK OPTIMA™ combines strength with lightness, rigidity and economy.




# PHYSICAL PROPERTIES

| | STANDARD | |
|---|---|---|
| Base Metal Thickness (BMT) (mm) | 0.42 | 0.48 |
| Total Coated Thickness (TCT) (mm) | 0.47 | 0.53 |
| Mass per Unit Area - COLORBOND® Steel (kg/m$^2$) | 4.60 | 5.21 |
| Mass per Unit Area - ZINCALUME® Steel (kg/m$^2$) | 4.52 | 5.13 |
| Coating Class (min) | AZ150 | |
| Grade of Steel (MPa) | G550 (550MPa minimum yield stress) | |
| Effective Cover Width | 935mm | |
| Rib Depth | 24mm | |
| Min Recommended Roof Pitch/ Slope | 3° (1 in 20) | |
| Tolerances | Length +0.0mm, -15.0mm / Width ± 4.0mm | |
| Custom Cut Lengths | Any measurement to a maximum transportable length. | |

# PERFORMANCE

## MAXIMUM ALLOWABLE SUPPORT SPACING

| Type of Span | BMT (mm) | |
|---|---|---|
| | 0.42 | 0.48 |
| **Roofs (mm)** | | |
| Single Span | 1500 | 2200 |
| End Span | 2100 | 2400 |
| Internal Span | 2300 | 3300 |
| Unstiffened Eaves Overhang | 200 | 250 |
| Stiffened Eaves Overhang | 450 | 500 |
| **Walls (mm)** | | |
| Single Span | 2200 | 2300 |
| End Span | 3100 | 3200 |
| Internal Span | 3300 | 3300 |
| Overhang | 150 | 150 |

- For roofs: the data are based on foot-traffic loading.
- For walls: the data are based on pressures (see wind pressures table).
- Table data are based on supports of 1mm BMT.

Basic wind speed (Strength Limit State) = 57m/sec
Terrain category co-efficient = 0.83
Shielding factor = 0.85
Topography factor = 1
Design wind speed Strength Limit State (with above factors) = 40.2m/sec
Basic wind speed (Strength Limit State) = 40m/sec
Terrain category co-efficient = 1
Shielding factor = 1
Topography factor = 1
Design wind speed Strength Limit State (with above factors) = 40m/sec

**Walls**

$C_{pe}$ = -0.65, $K_l$ = 2 for single and end spans, $K_l$ = 1.5 for internal spans
$C_{pi}$ = +0.2

**Roofs**

$C_{pe}$ = -0.9, $K_l$ = 2 for single and end spans, $K_l$ = 1.5 for internal spans
$C_{pi}$ = +0.2

These spacings may vary by Serviceability and Strength Limit States for particular projects.

## MAXIMUM ROOF LENGTHS FOR DRAINAGE MEASURED FROM RIDGE TO GUTTER (m)

| Peak Rainfall Intensity (mm/hr) | Roof Slope (degrees) | | | |
|---|---|---|---|---|
| | 3 | 5 | 7.5 | 10 |
| 100 | 122 | 147 | 170 | 191 |
| 150 | 82 | 98 | 113 | 127 |
| 200 | 61 | 73 | 85 | 95 |
| 250 | 49 | 59 | 68 | 76 |
| 300 | 41 | 49 | 57 | 64 |
| 400 | 31 | 37 | 43 | 48 |
| 500 | 24 | 29 | 34 | 38 |

Penetrations will alter the flow of water on a roof. For assistance in design of roofs with penetrations, please seek advice from Lysaght representative.

## LIMIT STATE WIND PRESSURE CAPACITIES (kPa)

| 0.42mm BMT | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| TYPE OF SPAN | LIMIT STATE | FOR ROOFS (c/c) SPAN (mm) | | | | | | | |
| | | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 | 3300 |
| Single | Serviceability | 3.46 | 2.67 | 1.94 | 1.29 | 0.80 | 0.48 | 0.32 | 0.24 | - |
| | Strength* | 10.85 | 8.70 | 6.70 | 4.98 | 3.68 | 2.92 | 2.58 | 2.53 | - |
| End | Serviceability | 3.12 | 2.71 | 2.31 | 1.93 | 1.58 | 1.27 | 0.99 | 0.74 | - |
| | Strength* | 7.94 | 6.46 | 5.08 | 3.88 | 2.95 | 2.36 | 2.04 | 1.92 | - |
| Internal | Serviceability | 3.47 | 2.99 | 2.54 | 2.13 | 1.76 | 1.46 | 1.21 | 0.99 | 0.79 |
| | Strength* | 9.09 | 7.53 | 6.08 | 4.79 | 3.78 | 3.11 | 2.69 | 2.48 | 2.34 |
| 0.48mm BMT | | | | | | | | | |
| TYPE OF SPAN | LIMIT STATE | FOR ROOFS (c/c) SPAN (mm) | | | | | | | |
| | | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 | 3300 |
| Single | Serviceability | 3.97 | 3.07 | 2.21 | 1.42 | 0.91 | 0.55 | 0.35 | 0.27 | 0.24 |
| | Strength* | 11.07 | 9.53 | 8.06 | 6.72 | 5.57 | 4.65 | 3.93 | 3.33 | 2.80 |
| End | Serviceability | 4.11 | 3.49 | 2.89 | 2.34 | 1.85 | 1.44 | 1.09 | 0.79 | 0.52 |
| | Strength* | 9.00 | 7.42 | 5.93 | 4.64 | 3.64 | 2.99 | 2.63 | 2.46 | 2.39 |
| Internal | Serviceability | 4.28 | 3.59 | 2.93 | 2.33 | 1.83 | 1.44 | 1.15 | 0.93 | 0.73 |
| | Strength* | 10.28 | 8.49 | 6.80 | 5.32 | 4.15 | 3.36 | 2.87 | 2.54 | 2.41 |

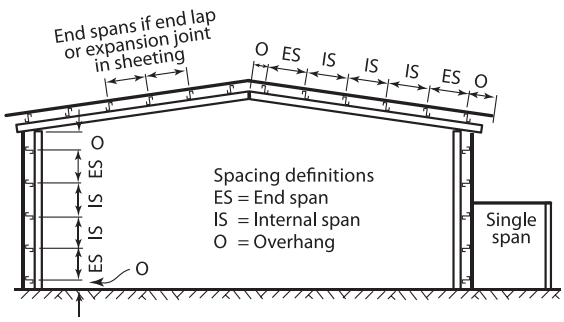
* A capacity reduction factor of 0.9 is applied to strength capacities. These capacities are based on tests conducted at BlueScope Steel's NATA registered testing laboratory using a direct pressure testing rig. Supports must not be less than 1mm BMT.

## LIMIT STATES WIND PRESSURES

The wind pressure capacities are based on tests conducted at BlueScope Lysaght's NATA-registered testing laboratory. Testing was conducted in accordance with AS 1562.1 - 1992 Design and Installation of Sheet Roof and Wall Cladding - Metal, and AS 4040.2 – 1992 Resistance to Wind Pressure for Non-cyclonic Regions.

The pressure capacities for serviceability are based on a deflection limit of (span/120) + (maximum fastener pitch/30).

The pressure capacities for strength have been determined by testing the cladding to failure (ultimate capacity). These pressures are applicable when the cladding is fixed to a minimum of 1.0mm, G550 steel.




# METHOD STATEMENT AND GENERAL NOTES

## WALKING ON ROOFS

Keep your weight evenly distributed over the soles of both feet to avoid concentrating your weight on either heels or toes. Always wear smooth soft-soled shoes; avoid ribbed soles that pick up and hold small stones, swarf, and other objects.

When waling across the width of the roof, walk over, or close to, the roof supports.

## ADVERSE CONDITIONS

If this product is to be used in marine, severe industrial, or unusually corrosive environments, ask for advice from our Lysaght representative.

## METAL & TIMBER COMPATIBILITY

Lead, copper, free carbon, bare steel and green or some other chemically treated timbers are not compatible with this product. Don't allow any contact of the product with those materials, nor discharge of rainwater from them onto the product. Supporting members should be coated to avoid problems with underside condensation. If there are doubts about the compatibility of other products being used, ask for advice from our Lysaght representative.

## MAINTENANCE

Optimum product life will be achieved if all external walls are washed regularly. Areas not cleaned by natural rainfall (such as the tops of walls sheltered by eaves) should be washed down every six months.

## SAFETY, STORAGE AND HANDLING

LSYAGHT's product may be sharp and heavy. It is recommended that heavy-duty cut resistant gloves and appropriate manual handling techniques or a lifting plan be used when handling material.

Keep the product dry and clear off the ground. If stacked or bundled product becomes wet, separate it, wipe it with a clean cloth to dry thoroughly.

Handle materials carefully to avoid damage: don't drag materials over rough surfaces or each other; don't drag tools over material; protect from swarf.

## CUTTING

For cutting thin metal on site, we recommend a circular saw with a metal cutting blade because it produces fewer damaging hot metal particles and leaves less resultant burr than a carborundum disc does.

Cut materials over the ground and not over other materials. Sweep all metallic swarf and other debris from roof areas and gutters at the end of each day and at the completion of the installation. Failure to do so can lead to surface staining when the metal particles rust.

## FASTENERS

| Fasteners without insulation | | | |
|---|---|---|---|
| | Fixing to steel<br>up to 0.75mm BMT | Fixing to steel<br>>0.75mm to 3mm BMT | Fixing to timber |
| Crest fixed | Self-drilling screws with hex. washer-head & EPDM seal,<br>12 - 11 x 50<br>(M5.5 – 11 x 50) | Self-drilling screws with hex. washer-head & EPDM seal,<br>12 - 14 x 50<br>(M5.5 – 14 x 50)<br>or<br>12 - 14 x 55<br>(M5.5 – 14 x 55) | Type 17 Self drilling screws with hex. washer-head & EPDM seal,<br>Softwood:<br>12 – 11 x 65 (M5.5 – 11 x 65)<br>Hardwood:<br>12 – 11 x 50 (M5.5 – 11 x 50) |
| Valley fixed | Self-drilling screws with hex. washer-head & EPDM seal,<br>10 - 12 x 20<br>(M4.8 – 12 x 20)<br>or<br>Self-drilling screws with hex. washer-head & EPDM seal,<br>10 - 16 x 16<br>(M4.8 – 16 x 16) | Self-drilling screws with hex. washer-head & EPDM seal,<br>12 - 14 x 20<br>(M5.5 – 14 x 20)<br>or<br>12 - 14 x 30<br>(M5.5 – 14 x 30) | Type 17 Self drilling screws with hex. washer-head & EPDM seal<br>Softwood:<br>10 – 12 x 30 (M4.8 – 12 x 30)<br>Hardwood:<br>10 – 12 x 20 (M4.8 – 12 x 20) |
| Side lap & accessories | Self-drilling screws with hex. washer-head & EPDM seal | 10 – 16 x 16<br>or<br>EPDM seal: 8 – 15 x 15 | |

| Fasteners with insulation | | | |
|---|---|---|---|
| | Fixing to steel<br>up to 0.75mm BMT | Fixing to steel<br>>0.75mm to 3mm BMT | Fixing to timber |
| Crest fixed | Self-drilling screws with hex. washer-head & EPDM seal,<br>12 - 11 x 50<br>(M5.5 – 11 x 50) | Self-drilling screws with hex. washer-head & EPDM seal,<br>12 - 14 x 65<br>(M5.5 – 14 x 65)<br>or<br>12 - 14 x 68<br>(M5.5 – 14 x 68) | Type 17 Self drilling screws with hex. washer-head<br>Softwood: 12 – 11 x 65 (M5.5 – 11 x 65)<br>Hardwood: 12 – 11 x 50 (M5.5 – 11 x 50) |
| Valley fixed | Self-drilling screws with hex. washer-head & EPDM seal,<br>10 - 12 x 20<br>(M4.8 – 12 x 20)<br>or<br>Self-drilling screws with hex. washer-head & EPDM seal,<br>10 - 16 x 16<br>(M4.8 – 16 x 16) | Self-drilling screws with hex. washer-head & EPDM seal,<br>12 - 14 x 30<br>(M5.5 – 14 x 30) | Type 17 Self drilling screws with hex. washer-head & EPDM seal<br>Softwood: 10 – 12 x 30 (M4.8 – 12 x 30)<br>Hardwood: 10 – 12 x 20 (M4.8 – 12 x 20)<br>Softwood: 12 – 14 x 30 (M5.5 – 14 x 30)<br>Hardwood: 12 – 14 x 20 (M5.5 – 14 x 20) |
| Side lap & accessories | Self-drilling screws with hex. washer-head & EPDM seal | 10 – 16 x 16<br>or<br>EPDM seal: 8 – 15 x 15 | |

LYSAGHT® SPANDEK OPTIMA™ requires 5 fasteners per sheet per support as shown below. Fastener should comply to AS3566, Class 3 or Class 4.

**Roof -** Screw fix though rib

Crest - 5 fixing

**Wall -** Screw fix though pan

Valley - 5 fixing

## FASTENING SHEETS TO SUPPORTS

LYSAGHT® SPANDEK OPTIMA™ profile is pierced-fixed to timber or steel supports. This means that fastener screws pass through the sheeting.

You can place fasteners for LYSAGHT® SPANDEK OPTIMA™ through the crests or in the pans. To maximize watertightness, always place roof fasteners through the crests.

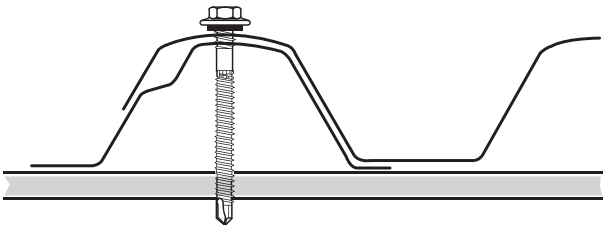
Always drive the fasteners perpendicular to the sheeting, and in the center of the corrugation or rib. Don't place fasteners less than 25mm from the ends of sheets.

## SEALED JOINTS

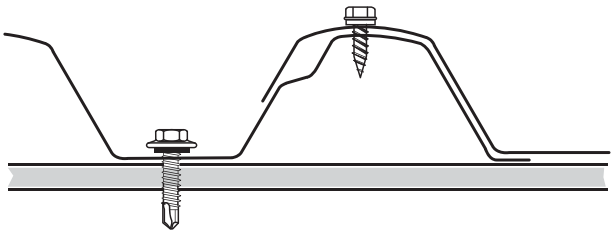
For sealed joints use screws or rivets and neutral-cure silicone sealant branded as suitable for use with galvanized or ZINCALUME® steel.

## SIDE-LAPS

The side of LYSAGHT® SPANDEK OPTIMA™ with the anti-capillary groove is always the underlap (see figures below). It is generally considered good practice to use fasteners along side-laps. However, when cladding is supported as indicated in Maximum Support Spacings, side-lap fasteners are not usually needed for strength.



Crest fixing for roof or walls



Valley fixing for walls only

## END LAPS
End-laps are not usually necessary because LYSAGHT® SPANDEK OPTIMA™ is available in long lengths. If you want end-laps, seek advice from our Lysaght representative on the sequence of laying and the amount of overlap.

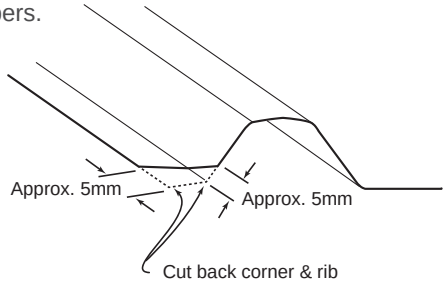
## END OF SHEETS
It is usual to allow roof sheets to overlap into gutters by about 50mm. If the roof pitch is less than 25° or extreme weather is expected, the pans of sheets should be turned-down at lower ends and turned-up at upper ends by about 80°.

## LAYING PROCEDURE
For maximum weather-tightness start laying sheets from the end of the building that will be in the lee of worst-anticipated or prevailing weather.

It is much easier and safer to turn sheets on the ground than up on the roof.

Before lifting sheets on to the roof, check that they are the correct way up and the overlapping side is towards the edge of the roof from which installation will start.

Place bundles of sheets over or near firm supports, not at mid span of roof members.




## SHEET-ENDS ON LOW SLOPES
When LYSAGHT® SPANDEK OPTIMA™ is laid on slopes of 5 degrees or less, cut back the corner of the under-sheet, at the downhill end of the sheet, to block capillary action.

# NON-CYCLONIC AREAS

The information in this brochure is suitable for use only in areas where a tropical cyclone is unlikely to occur as defined in AS 1170.2-2002. Map and table (below) taken from HB212-2002.


**Wind speeds versus return period**
(3 s guts, 10 m height, open country terrain)

| Handbook Level | Description | Equation for $V_R$ | $V_{50}$ | $V_{500}$ |
|---|---|---|---|---|
| I | Strong thunderstorms and monsoon winds | $70 - 56R^{-0.1}$ | 32 | 40 |
| II | Moderately severe thunderstorms and extra-tropical gales | $67 - 41R^{-0.1}$ | 39 | 45 |
| III | Severe thunderstorms and moderate or weakening typhoons/tropical cyclones | $106 - 92R^{-0.1}$ | 44 | 57 |
| IV | Strong typhoons/ tropical cyclones | $122 - 104R^{-0.1}$ | 52 | 66 |
| V | Very strong typhoons/ tropical cyclones | $156 - 142R^{-0.1}$ | 60 | 80 |

Table summarises the proposed relationships between 3 s gust wind speed and return period for the five levels in the handbook (see map). The values are for 50 years and 500 years return periods.

Note: All the product images used in this brochure are for reference purposes only and does not reflect the actual configuration of the product. Kindly note that the product images are indicative and for illustration purposes only. Lysaght reserves the right to make any change to product images without prior notice. For accurate and up-to-date information, seek advice from Lysaght representative.

# COLORBOND® STEEL AND ZINCALUME® STEEL

## STRONG BRANDS, QUALITY MATERIALS

LYSAGHT® products are made of highest quality material, namely COLORBOND® steel and ZINCALUME® steel which are the leading materials for external cladding application. COLORBOND® steel and ZINCALUME® steel have been used on countless buildings to portray modern architecture works of art, ranges from the classic roofing to advance façade for industrial, commercial and residential buildings.

Colorbond®

COLORBOND® steel is a pre-painted finished product with ZINCALUME® steel substrate to deliver both superior corrosion resistance and excellent colour performance.

It comes with the THERMATECH® solar reflectance technology and Clean technology to minimize tropical dirt staining while lowering urban heat island effect, delivering longevity and minimal maintenance to your external cladding.

COLORBOND® steel is backed by a material warranty of up to 25 years*

**Product Attributes**

- Pre-painted finish on top of ZINCALUME® steel substrate to deliver superior corrosion resistance.
- Superior primer technology which prevents paint delamination.
- Proprietary super polyester paint system proven to provide excellent colour performance.
- Clean technology incorporated to resist against tropical dirt staining.
- THERMATECH® solar reflectance technology to allow for lower temperature cladding.
- Wide varieties of colours and finishes to cater for your building design needs.

Zincalume®

ZINCALUME® steel is a metallic coated steel product composed of 55% aluminium, 43.5% zinc and 1.5% silicon (aluminium-zinc alloy coating) that can provide superior corrosion resistance for your external cladding, with expected lifespan that's four times the life of generic alternatives (GI).

ZINCALUME® steel is backed by a material warranty of up to 25 years*

**Product Attributes**

- Superior corrosion resistance due to the minimum coating class of AZ150.
- Initial resistance to surface marking and wet storage corrosion due to the proprietary clear resin coating.
- Better aesthetics compared to generic alternatives (Al-Zn) due to less surface darkening, afforded by the proprietary clear resin coating.
- Lightweight and thermally efficient compared to conventional roofing materials (e.g. concrete and clay tiles)
- Excellent flexibility in design as steel can be bent and curved to form truly unique designs.

**Warranty terms and conditions apply*

This material warranty may vary to buildings nearer to marine or industrial environment and is subjected to prior agreement by BlueScope. For full terms and conditions and to determine the eligibility of your project for the warranty, please contact your Key Account Manager.

There are different internal and external environments affecting the longevity of COLORBOND® steel and ZINCALUME® steel, hence feel free to consult our material experts for more specialized recommendations.

**Examples of recommendations:**

- Direct contact between COLORBOND® steel or ZINCALUME® steel with copper, lead and stainless steel should be avoided.

If condensation on the reverse side of roofing sheet is likely, vapour barrier should be installed to shield COLORBOND® steel or ZINCALUME® steel from prolonged exposure to the condensation (moisture).

# REFERENCES

Hap Seng Business Park, Shah Alam

Stinis Factory @ Nusajaya, Johor

ONE°15 Estuari Sports Centre, Johor

# REFERENCES

A&A at Ngee Ann Polytechnic, Singapore

The Seed Residential @ Sutera, Skudai, Johor

The Seed Residential @ Sutera, Skudai, Johor

COATING


COLOUR CHOICES


DESIGN FLEXIBILITY


DURABILITY / SECURITY


HI-TECH PRODUCTION


RECYCLING


TERMITE PROOF


THERMAL EFFICIENCY

WARRANTY

BLUESCOPE LYSAGHT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ECO-LABEL
*'Recyclable Steel'*
Certified to : SIRIM ECO 032: 2020
Certification No. : EL000377

Find us on Lysaght Malaysia

STEEL SUPPLIED BY BlueScope

Colorbond® Zincalume®


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