LYSAGHT™

# SPANDEK® 935

## Trapezoidal Steel Cladding

TATA BLUESCOPE
BUILDING PRODUCTS

(A Division of Tata BlueScope Steel Limited)

# SPANDEK® 935

LYSAGHT SPANDEK® 935 is a contemporary looking, trapezoidal profile which is ideal where a stronger, bolder, more modern appearance is required.

SPANDEK® 935 was originally designed as a strong attractive roofing material for industrial and commercial construction, however SPANDEK® 935 has proved equally popular for homes and public buildings, underlining its versatility and pleasing appearance.

SPANDEK® 935 combines strength with lightness, rigidity and economy.

### Simple, low-cost fixing

Long, straight lengths of SPANDEK® 935 can be lowered into place and aligned easily. Fixing with hexagon headed screws is simple and fast.

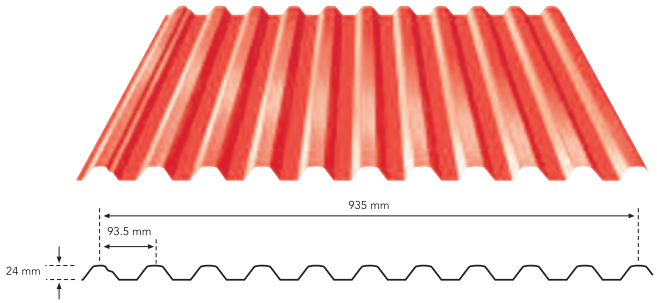



Fig. 1

### Profie

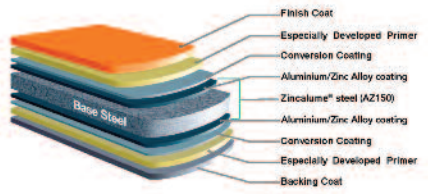
LYSAGHT SPANDEK® 935 is 935 mm wide coverage profile with 24 mm deep ribs. The end ribs are designed with anti-capillary actions to avoid any seepage of water through the lateral overlap. *(Please refer fig. 1)*

## Material Specifications

### High Strength Steel base

LYSAGHT SPANDEK® 935 is manufactured out of high strength steel with minimum yield strength of 550 MPa. The coated steel is ZINCALUME® aluminium/zinc alloy-coated steel complying with AS 1397, G550, AZ150 (550 MPa minimum yield stress, 150 g/m$^2$ minimum coating mass); or COLORBOND® steel conforming to AS/NZS 2728 Type 3-4.

*(Please refer ZINCALUME® steel & COLORBOND® steel brochure for details)*




Cross Sectional View of COLORBOND® steel

### Lengths

Sheets are supplied custom cut.

### Tolerances

Length: + 0 mm, - 15 mm

Width: + 4 mm, - 4 mm

**Masses**

| BMT* | TCT* | Product | kg/m | kg/m$^2$ |
|---|---|---|---|---|
| 0.35 | 0.40 | ZINCALUME® steel | 3.56 | 3.81 |
| 0.35 | 0.40 | COLORBOND® steel | 3.63 | 3.89 |
| 0.40 | 0.45 | ZINCALUME® steel | 4.04 | 4.32 |
| 0.40 | 0.45 | COLORBOND® steel | 4.11 | 4.40 |
| 0.45 | 0.50 | ZINCALUME® steel | 4.52 | 4.83 |
| 0.45 | 0.50 | COLORBOND® steel | 4.59 | 4.91 |

*All dimensions are in mm.

### Walking on roofs

Generally, 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.

### Maximum support spacings

The maximum recommended support spacings are based on testing in accordance with AS1562.1-1992, AS4040.1-1992 and AS4040.2-1992.

Roof spans consider both resistance to wind pressure and light roof traffic (traffic arising from incidental maintenance).

Wall Spans considers resistance to wind pressure only.

The pressure considered (in accordance with IS 875.3) is based on buildings up to 10m high, Zone 3 (Basic wind speed $V_b$ = 47m/s), Class A, Terrain category 3, $K_1$ = 1.0, $K_2$ = 0.91, $K_3$ = 1.0, with the following assumptions made;

### Roofs:

$C_{pe}$ = - 1.20 (internal cladding spans)

$C_{pe}$ = - 2.0 (single and end cladding spans)

$C_{pi}$ = + 0.2

### Walls:

$C_{pe}$ = - 0.80 (internal cladding spans)

$C_{pe}$ = - 1.20 (single and end cladding spans)

$C_{pi}$ = + 0.2

These spacings may vary for particular projects, depending on specific structure characteristics.

**Maximum Support Spacings (mm)**

| | Total Coated Thickness (mm) | | |
|---|---|---|---|
| Type of span | 0.40 | 0.45 | 0.50 |
| **Roofs** | | | |
| Single Span | 700 | 900 | 1250 |
| End Span | - | 1100 | 1300 |
| Internal Span | 1700 | 1950 | 2250 |
| Unstiffened eaves overhang | 200 | 250 | 300 |
| Stiffened eaves overhang | 450 | 500 | 600 |
| **Walls** | | | |
| Single Span | 1400 | 1700 | 2050 |
| End Span | 900 | 1500 | 1800 |
| Internal Span | 1500 | 2400 | 2700 |
| Overhang | | | |

* For roofs, the data are based on foot-trafic loading.
* For walls, the data are based on pressure (see pressure table)
* Tables are based on supports on 1 mm BMT.
* Please contact Tata BlueScope Building Products Office before adopting for design.

### Maximum roof lengths for drainage measured from ridge to gutter (m)

Penetrations will alter the flow of water on a roof. For assistance in design of roofs with penetrations, please seek advice from your nearest Tata BlueScope Building Products office.

**Maximum Roof Run (m) as based on CSIRO Formula**

| Profile | Rainfall intensity mm/hr | Roof Slope | | | | | |
|---|---|---|---|---|---|---|---|
| | | 1° | 2° | 3° | 5° | 7.5° | 10° |
| SPANDEK® 935 Flow Area =178 $m^2$ | 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 |

### Limit states wind pressures

SPANDEK® 935 offers the full benefits of the latest methods for modeling wind pressures. The Wind pressure capacity table is determined by full-scale test's conducted at BlueScope Steel's NATA-registered testing laboratory, using the direct pressure-testing rig.

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 Pressures 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 1.0 mm, G550 steel.

For material less than 1.0 mm thick, seek advice from your nearest Tata BlueScope Building Products office.

### Metal & timber compatibility

Lead, copper, bare steel and green or some chemically treated timbers are not compatible with this product; thus don't allow any contact of the product with those materials, nor discharge of rainwater from them onto the product.

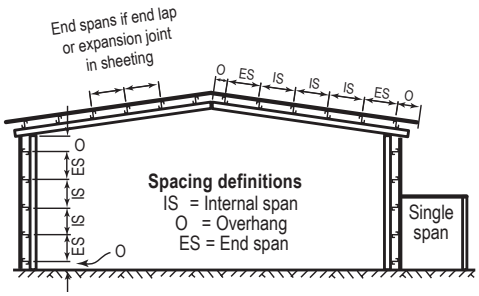
If there are doubts about the compatibility of products being used, ask for advice from your nearest Tata BlueScope Building Products office.

| SPANDEK® 935: Limit state wind pressure capacities (kPa) | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Span Type | Fasteners per sheet per support | | Span (mm) | | | | | | | |
| | | | 900 | 1200 | 1500 | 1800 | 2100 | 2400 | 2700 | 3000 | 3300 |
| SPANDEK® 935 - 0.40 mm Base Metal Thickness (0.45 mm Total Coated Thickness) | | | | | | | | | | |
| SINGLE | 4 | Serviceability | 2.20 | 1.75 | 1.35 | 1.01 | 0.76 | 0.59 | 0.47 | 0.38 | - |
| | | Strength* | 10.20 | 7.90 | 5.85 | 4.20 | 3.10 | 2.55 | 2.30 | 2.20 | - |
| | 5 | Serviceability | 3.99 | 2.98 | 2.07 | 1.34 | 0.86 | 0.59 | 0.47 | 0.41 | - |
| | | Strength* | 11.00 | 8.80 | 6.80 | 5.15 | 4.05 | 3.35 | 2.95 | 2.65 | - |
| DOUBLE | 4 | Serviceability | 1.89 | 1.60 | 1.33 | 1.10 | 0.92 | 0.79 | 0.69 | 0.61 | - |
| | | Strength* | 5.95 | 4.60 | 3.35 | 2.40 | 1.75 | 1.45 | 1.25 | 1.25 | - |
| | 5 | Serviceability | 4.04 | 3.17 | 2.38 | 1.74 | 1.29 | 1.03 | 0.88 | 0.78 | - |
| | | Strength* | 7.35 | 5.70 | 4.25 | 3.05 | 2.30 | 1.95 | 1.75 | 1.75 | - |
| INTERNAL | 4 | Serviceability | 1.84 | 1.55 | 1.29 | 1.05 | 0.87 | 0.74 | 0.66 | 0.62 | 0.59 |
| | | Strength* | 7.65 | 6.30 | 5.10 | 4.00 | 3.10 | 2.50 | 2.10 | 1.90 | 1.70 |
| | 5 | Serviceability | 3.70 | 3.08 | 2.50 | 1.98 | 1.56 | 1.24 | 1.03 | 0.88 | 0.77 |
| | | Strength* | 7.95 | 6.55 | 5.30 | 4.15 | 3.25 | 2.65 | 2.30 | 2.15 | 2.00 |
| SPANDEK® 935 - 0.45 mm Base Metal Thickness (0.50 mm Total Coated Thickness) | | | | | | | | | | |
| SINGLE | 4 | Serviceability | 2.93 | 2.28 | 1.70 | 1.22 | 0.88 | 0.66 | 0.53 | 0.44 | - |
| | | Strength* | 11.15 | 8.65 | 6.40 | 4.65 | 3.50 | 2.95 | 2.70 | 2.70 | - |
| | 5 | Serviceability | 4.41 | 3.34 | 2.38 | 1.60 | 1.07 | 0.75 | 0.58 | 0.48 | - |
| | | Strength* | 11.80 | 9.85 | 8.00 | 6.45 | 5.30 | 4.40 | 3.75 | 3.20 | - |
| DOUBLE | 4 | Serviceability | 2.40 | 2.00 | 1.64 | 1.34 | 1.12 | 0.97 | 0.87 | 0.79 | - |
| | | Strength* | 7.25 | 5.55 | 4.00 | 2.80 | 2.00 | 1.65 | 1.50 | 1.50 | - |
| | 5 | Serviceability | 5.10 | 3.94 | 2.89 | 2.05 | 1.48 | 1.16 | 0.99 | 0.90 | - |
| | | Strength* | 8.75 | 6.80 | 5.10 | 3.70 | 2.85 | 2.40 | 2.20 | 2.20 | - |
| INTERNAL | 4 | Serviceability | 2.27 | 1.93 | 1.61 | 1.32 | 1.10 | 0.93 | 0.82 | 0.75 | 0.70 |
| | | Strength* | 7.65 | 6.15 | 4.75 | 3.55 | 2.65 | 2.05 | 1.75 | 1.65 | 1.65 |
| | 5 | Serviceability | 4.33 | 3.64 | 2.98 | 2.39 | 1.91 | 1.54 | 1.27 | 1.07 | 0.91 |
| | | Strength* | 9.85 | 8.15 | 6.60 | 5.20 | 4.10 | 3.35 | 2.85 | 2.60 | 2.40 |

*A capacity reduction factor of Ø= 0.9 has been applied to strength capacities. Supports must be not less than 1 mm BMT.
*Please contact Tata BlueScope Building Products office before adopting for design.

## Maintenance

Optimum product life will be achieved if all external surfaces 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.




## Storage and handling

Keep the product dry and clear of the ground. If stacked or bundled product becomes wet, separate it, wipe it with a clean cloth and stack it to dry thoroughly. Handle materials carefully to avoid damage: don't drag materials over rough surfaces or each other; carry tools, don't drag them; 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.

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.

## Non-cyclonic areas

The information in this brochure is suitable for use only in areas where a tropical cyclone is unlikely to occur.

Ask for advice from your nearest Tata BlueScope Building Products office on designs to be used in cyclonic areas.

## Installation

### Fastening sheets to supports

SPANDEK® 935 is pierce-fixed to steel or timber supports. This means that fastener screws pass through the sheeting.

You can place screws for SPANDEK® 935 through the crests or in the valleys. To maximize water tightness, always place roof screws through the crests. For walling, you may use either crest- or valley fixing.

Always drive the screws perpendicular to the sheeting, and in the centre of the corrugation or rib.

Don't place fasteners less than 25 mm from the ends of sheets.

All the fasteners shall confirm to Australian Standard AS 3566 Class 3-4 (min) for external application.

### Side-laps

The edge of SPANDEK® 935 with the anti-capillary groove is always the underlap. 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.

### End lapping

End-laps are not usually necessary because SPANDEK® 935 is available in long lengths.

If you want end-laps, seek advice from your nearest Tata BlueScope Building Products office on the sequence of laying and the amount of overlap.

### Ends of sheets

It is usual to allow roof sheets to overlap into gutters by about 50 mm.

If the roof pitch is less than $25^0$ or extreme weather is expected, the valleys of sheets should be turned down at lower ends, and turned-up at upper ends by about $80^0$.

### Laying procedure

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

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

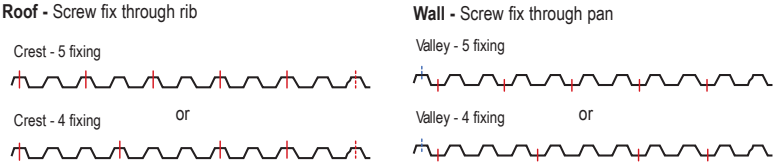
Before lifting sheets on to the roof, check that they are the correct way up and the overlapping side is towards the edge of the roof from which installation will start.

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

### Sheet-ends on low slopes

When SPANDEK® 935 is laid on slopes of 5 degrees or less, cut back the corner of the under-sheet, at the down-hill end of the sheet, to block capillary action. *(Please refer fig. 2)*

**SPANDEK® 935: Fastening sheet to support**



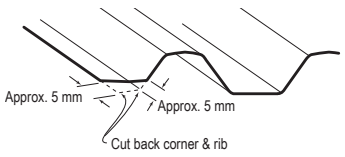




Fig. 2

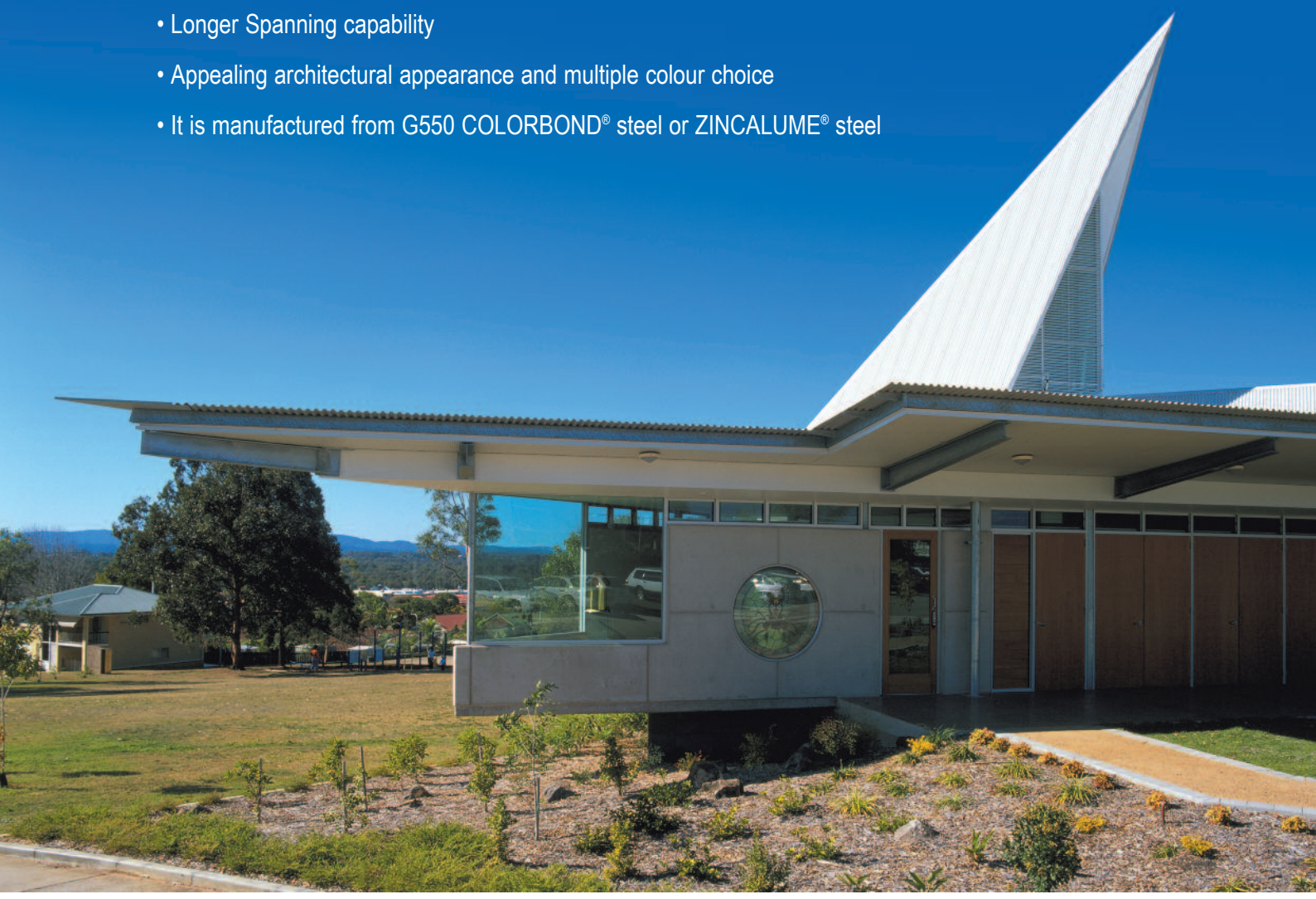
**Fasteners without insulation**

| Support Details | Numbers of Fasteners Requirements Screws | | Crest Fixing Roof & Wall Application | Valley Fixing Wall Application only |
|---|---|---|---|---|
| | Per Sheet/support | Per $m^2$ | | |
| Steel up to 0.75 mm BMT | 4 or 5 | 5* | 13 -13 x 55, Batten Teks HG, Hex Head | 10-16 x16 Metal Teks, Hex Head |
| Steel > 0.75 mm BMT up to 3 mm BMT | | | 12 -14 x 45, Metal Teks HG, Hex Head | 10-16 x16 Metal Teks, Hex Head |
| Timber - Softwood | | | 12 -11 x 65, Type 17 HG, Hex Head | 10-12 x 30, Type 17 HG, Hex Head |
| Timber - Hardwood | | | 12 -11 x 50, Type 17 HG, Hex Head | 10-12 x 20, Type 17 HG, Hex Head |

Note:
1. All screws are self drilling self tapping with EPDM sealing washer unless otherwise noted.
2. The number of screws per support are per $m^2$ are only for guidance, based on support spaced at 1 m and wall 0.6m.
3. HG refers to Hi-Grips.
4. * - the screw quantity is based on an average number of screws.
5. Please refer the above data for guidance purpose only, and may contact Tata BlueScope Building Products office for further information.

## LYSAGHT SPANDEK® 935 - Design Advantages

- Bold and strong appearance
- Strongest cladding can withstand high wind load, snow load or impact load
- Unique anti-capillary side-lap which makes it leak proof
- Longer Spanning capability
- Appealing architectural appearance and multiple colour choice
- It is manufactured from G550 COLORBOND® steel or ZINCALUME® steel



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