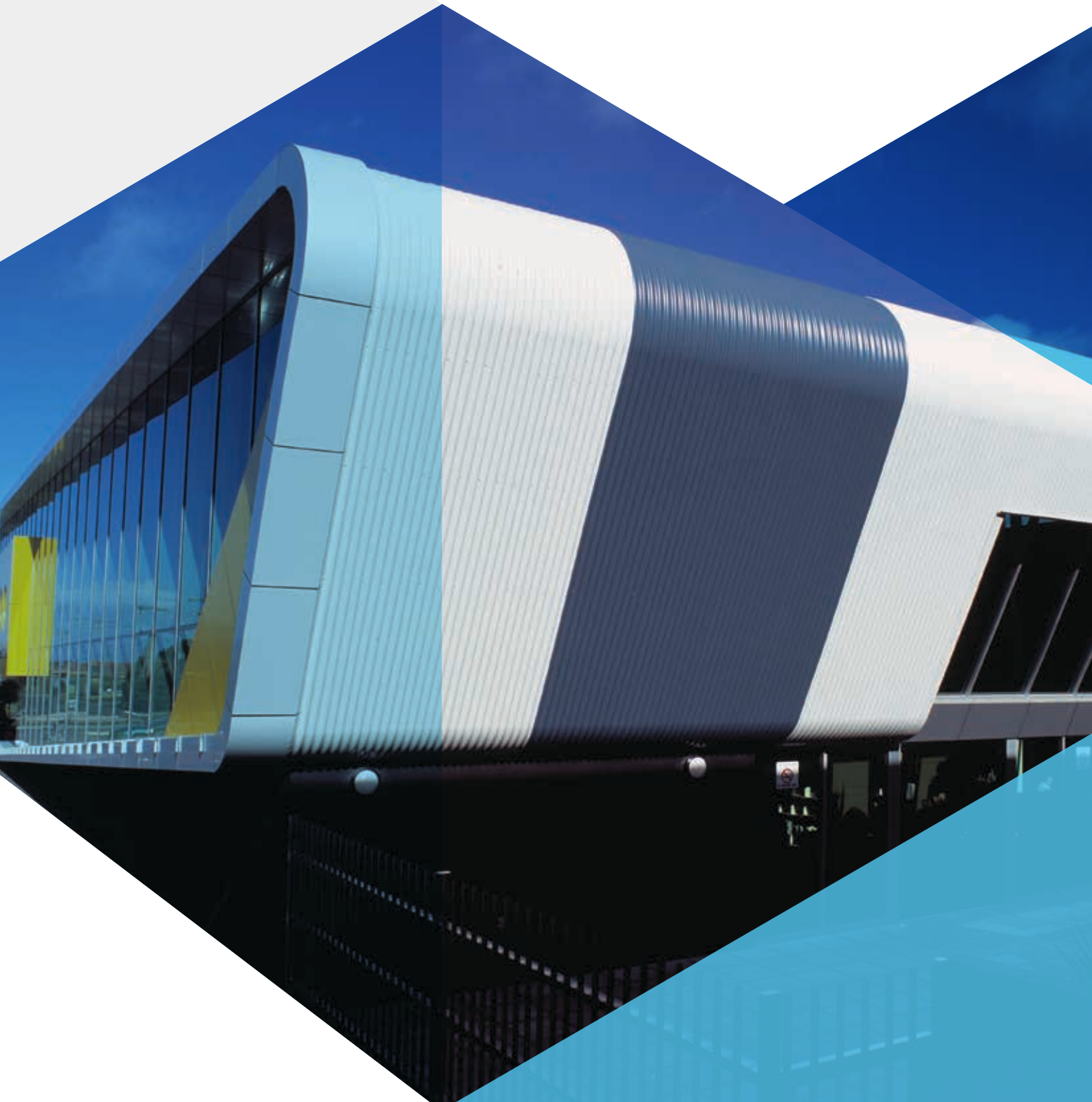
CUSTOM ORB®
CUSTOM BLUE ORB®

DESIGN AND INSTALLATION GUIDE



LYSAGHT CUSTOM ORB® & CUSTOM BLUE ORB®

TRADITIONAL CORRUGATED STEEL CLADDING

CUSTOM ORB® is the famous corrugated profile, equally at home with traditional and contemporary design. It is a wide, strong and lightweight profile that can be quickly and easily installed. Add up these features and you have a steel roof or wall cladding that simply offers outstanding value.

The gently curving shape of the classic Australian roof is reflected in some of today's most adventurous and dramatic designs. CUSTOM BLUE ORB® is the corrugated profile for curving, allowing the expression of this quintessential Australian style. It is the perfect match to harmonise with our well-known, traditional CUSTOM ORB®.

MATERIAL SPECIFICATIONS

Next generation ZINCALUME® aluminium/zinc/magnesium alloy coated steel complies with AS 1397:2011 G550, AM125 (550 MPa minimum yield stress, 125g/m^2 minimum coating mass). CUSTOM BLUE ORB® is G300 (300 MPa). Minimum coating mass is AM125 (125g/m^2).

COLORBOND® is pre-painted steel for exterior roofing and walling. It is the most widely used. The painting complies with AS/NZS 2728:2013 and the steel base is an aluminium/zinc alloy-coated steel complying with AS 1397:2011. Minimum yield strength for CUSTOM ORB® is G550 (550 MPa) or for CUSTOM BLUE ORB® is G300 (300 MPa). Minimum coating mass is AM100 (100g/m^2).

COLORBOND® Metallic is pre-painted steel for superior aesthetic qualities displaying a metallic sheen.

COLORBOND® Ultra is pre-painted steel for severe coastal or industrial environments (generally within about 100-200 metres of the source). The painting complies with AS/NZS 2728:2013 and the steel base is an aluminium/zinc alloy-coated steel complying with AS 1397:2011. Minimum coating mass is AM150 (150g/m^2). Minimum yield strength for CUSTOM ORB® is G550 (550 MPa) or for CUSTOM BLUE ORB® is G300 (300 MPa). Minimum coating mass is AM150 (150g/m^2).

COLORBOND® Stainless is a pre-painted steel and is used for severe and coastal environments. The painting complies with AS/NZS 2728:2013 and the steel base is a stainless steel complying with AISI/ASTM Type 430; UNS No. S43000.

CUSTOM BLUE ORB® MATERIAL SPECIFICATION FOR TANK MAKING

ZINCFORM® zinc coated (galvanised) steel complying with AS 1397:2011 G300, Z600 (300 MPa minimum yield stress, 600g/m^2 minimum coating mass);

COLORBOND® steel base metal thickness is 0.60 or 0.80mm. The COLORBOND® pre-painted steel complies with AS/NZS 2728:2013.

COLOURS

CUSTOM ORB® and CUSTOM BLUE ORB® are available in an attractive range of colours in COLORBOND® factory pre-painted steel and in unpainted ZINCALUME® aluminium/zinc/magnesium alloy coated steel.

Standard COLORBOND® steel is available in a select range of contemporary colours suitable for all building projects.

COLORBOND® STEEL WITH THERMATECH® TECHNOLOGY

THERMATECH® solar reflectance technology is now included in the standard COLORBOND® steel palette. COLORBOND® steel with THERMATECH® technology reflects more of the sun's heat, allowing both roofs and buildings stay cooler in summer. In moderate to hot climates, compared to roofing materials of similar colour with low solar reflectance, COLORBOND® steel with THERMATECH® can reduce annual cooling and energy consumption by up to 20%.

LENGTHS

Sheets are supplied custom cut.

CUSTOM ORB® MASSES

	BMT (mm)	kg/m	kg/m^2	m^2/t
ZINCALUME® steel	0.42	3.26	4.28	234
COLORBOND® steel	0.42	3.32	4.35	230
ZINCALUME® steel	0.48	3.70	4.86	206
COLORBOND® steel	0.48	3.76	4.93	203

CUSTOM BLUE ORB® MASSES

	BMT (mm)	kg/m	kg/m^2	m^2/t
ZINCALUME® steel	0.60	4.59	6.02	166
COLORBOND® steel	0.60	4.64	6.09	164
ZINCALUME® steel	0.80*	6.06	7.96	126
COLORBOND® steel	0.80*	6.12	8.03	125

*0.80 BMT CUSTOM BLUE ORB® available in South Australia only.

TOLERANCES (CUSTOM ORB® & CUSTOM BLUE ORB®)

Length: + 10mm, – 10mm, Width: + 4mm, – 4mm

SHEET LENGTHS

Sheet lengths of up to 24m can be used before an expansion joint is required for roof applications.

MAXIMUM SUPPORT SPACINGS

The maximum recommended support spacings are based on testing in accordance with AS 1562.1:1992, AS 4040.1:1992 and AS 4040.2:1992.

Roof spans consider both resistance to wind pressure and light roof traffic (traffic arising from incidental maintenance). Wall spans consider resistance to wind pressure only. The pressure considered is based on buildings up to 10m high in Region B, Terrain Category 3, M_s=0.85, M_l=1.0, M_t=1.0 with the following assumptions made:

ROOFS:

C_{pi}=+0.20, C_{pe}=-0.90, K_l=2.0 for single and end spans, K_l=1.5 for internal spans.

WALLS:

C_{pi}=+0.20, C_{pe}=-0.65, K_l=2.0 for single spans and end spans, K_l=1.5 for internal spans.

These spacings may vary by serviceability and strength limit states for particular projects.

CUSTOM ORB® MAXIMUM SUPPORT SPACING (MM)

	BMT	
Type of Span	**0.42mm**	**0.48mm**
Roofs		
Single span	700	800
End span	900	1300
Internal span	1200	1700
Unstiffened eaves overhang	200	250
Stiffened eaves overhang	300	350
Walls		
Single span	1800	1800
End span	2500	2700
Internal span	2700	2700
Overhang	200	250

For roofs: the data are based on foot-traffic loading.
For walls: the data are based on pressures (see wind pressure table).
Table data are based on supports of minimum 1mm BMT. Refer to the TOPSPAN® Quick Selection Guide for support thickness less than 1.0 mm BMT, or seek advice from our information line.

CUSTOM BLUE ORB® MAXIMUM SUPPORT SPACING (MM)

	BMT	
Type of Span	**0.60mm**	**0.80mm**
Roofs including bullnosed roofs		
Single span	1600	1800
End span	1600	1800
Internal span	1800	2600
Unstiffened eaves overhang	200	400
Stiffened eaves overhang	300	600
Walls		
Single span	2400	2400
End span	3000	3200
Internal span	3300	3600
Overhang	200	400

For roofs: the data are based on foot-traffic loading.
For walls: the data are based on pressures (see wind pressure table).
Table data are based on supports of minimum 1mm BMT. Refer to the TOPSPAN® Quick Selection Guide for support thickness less than 1.0 mm BMT, or seek advice from our information line.

CURVING

CUSTOM ORB® is not intended for machine curving. For bullnosing use CUSTOM BLUE ORB®. Long, curved lengths of CUSTOM BLUE ORB® can be easily placed and aligned. From the traditional bullnosed verandah, to the double curves and complex shapes of modern homes and offices, we offer a full range of curving styles to suit almost any building.

The extra ductility of CUSTOM BLUE ORB® allows easy curving without distortion of its profile, and without damage to the finish. Ensure you order the appropriate profile for the job.

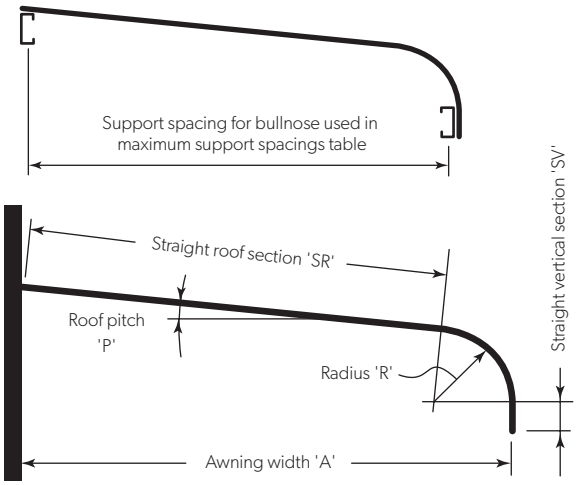
USE CUSTOM BLUE ORB® FOR CURVES

CURVING RADII

The minimum curving radius is 300mm (400mm in Victoria). At the end of a curve, there must be a straight vertical section of at least 100mm (80mm in Victoria).

CURVING TOLERANCES CUSTOM BLUE ORB®

Straight vertical min. (SV) = 100 mm (80mm in Victoria)
Radius min. (R) = 300 mm (See page 7 for definitions of SV & R).



Span to be used in determining wind pressure capacities of bullnoses $= SR + (\text{arc of radius } R)$

$$= \frac{A - R(1 - \sin P)}{\cos P} + \frac{R\pi(90 - P)}{180}$$

USE CUSTOM ORB® FOR LONG STRAIGHT STRETCHES

On most jobs one sheet will cover from ridge to gutter without end-laps. Where there are long straight lengths, you may like to use CUSTOM ORB® for the straight sections.

If you have a design where CUSTOM BLUE ORB® laps with CUSTOM ORB®, it is recommended both should be ordered together to ensure perfect lapping.

CURVED FLASHINGS

Curved flashings and cappings are made in fibreglass, plastic and steel in standard COLORBOND® steel colours.

Straight flashings and cappings are also made to match. Different states stock different materials and different lengths—ask your local supplier.

CUSTOM ORB® LIMIT STATE WIND PRESSURE CAPACITIES (KPA) 0.42 BMT

Span Type	Fasteners per sheet per support	Limit State	Span (mm)							
			600	900	1200	1500	1800	2100	2400	2700
Single	3	Serviceability	1.91	1.46	1.08	0.77	0.49	-	-	-
		Strength	12.00	8.60	5.80	4.65	4.50	-	-	-
	5	Serviceability	5.39	3.20	1.75	0.94	0.45	-	-	-
		Strength	12.00	12.00	10.15	8.10	7.40	-	-	-
End	3	Serviceability	1.66	1.40	1.18	1.00	0.83	0.67	0.52	0.38
		Strength	9.15	7.55	5.90	4.50	3.40	2.70	2.30	2.00
	5	Serviceability	6.08	4.27	2.79	1.59	1.02	0.65	0.42	0.30
		Strength	12.00	12.00	9.90	7.55	5.75	4.50	3.60	3.05
Internal	3	Serviceability	1.91	1.67	1.45	1.23	1.03	0.85	0.69	0.56
		Strength	11.35	9.25	7.45	6.00	4.85	3.90	3.20	2.70
	5	Serviceability	7.00	4.92	3.32	2.21	1.49	1.05	0.78	0.59
		Strength	12.00	12.00	12.00	10.80	8.85	7.10	5.65	4.50

CUSTOM ORB® LIMIT STATE WIND PRESSURE CAPACITIES (KPA) 0.48 BMT

Span Type	Fasteners per sheet per support	Limit State	Span (mm)							
			600	900	1200	1500	1800	2100	2400	2700
Single	3	Serviceability	2.12	1.47	1.03	0.77	0.60	-	-	-
		Strength	12.00	9.80	6.55	5.30	5.10	-	-	-
	5	Serviceability	7.48	3.74	2.23	1.26	0.57	-	-	-
		Strength	12.00	12.00	10.75	8.65	8.10	-	-	-
End	3	Serviceability	1.92	1.66	1.48	1.35	1.19	1.01	0.81	0.60
		Strength	11.70	9.05	6.80	4.95	4.10	3.45	3.00	2.65
	5	Serviceability	8.00	4.75	2.86	1.97	1.39	0.97	0.66	0.44
		Strength	12.00	12.00	12.00	10.60	8.00	6.20	5.00	4.25
Internal	3	Serviceability	1.98	1.96	1.84	1.62	1.36	1.07	0.82	0.62
		Strength	12.00	10.15	8.50	7.10	5.70	4.55	3.60	2.90
	5	Serviceability	9.00	5.42	4.34	3.31	2.37	1.57	0.95	0.54
		Strength	12.00	12.00	12.00	12.00	11.00	8.65	6.75	5.25

Support must not be less than 1mm BMT.

CUSTOM BLUE ORB® LIMIT STATE WIND PRESSURE CAPACITIES (KPA) 0.60 BMT

Span Type	Fasteners per sheet per support	Limit State	Span (mm)										
			600	900	1200	1500	1800	2100	2400	2700	3000	3300	3600
Single	3	Serviceability	3.32	2.58	1.94	1.48	1.08	0.73	0.39	-	-	-	-
		Strength	12.00	10.55	7.25	5.85	5.05	4.55	4.30	-	-	-	-
	5	Serviceability	10.50	6.03	2.62	1.30	0.62	0.36	0.32	-	-	-	-
		Strength	12.00	12.00	12.00	10.00	8.35	7.25	6.35	-	-	-	-
End	3	Serviceability	2.85	2.41	1.99	1.62	1.29	1.01	0.78	0.58	0.41	0.26	-
		Strength	12.00	12.00	9.10	6.75	5.25	3.60	4.05	3.60	3.15	2.70	-
	5	Serviceability	11.00	7.72	4.80	2.62	1.40	0.89	0.73	0.58	0.41	0.23	-
		Strength	12.00	12.00	12.00	9.05	7.35	6.55	6.20	5.70	5.05	4.30	-
Internal	3	Serviceability	3.5	2.55	2.11	1.75	1.48	1.25	1.05	0.84	0.63	0.42	0.21
		Strength	12.00	12.00	9.15	6.80	5.65	5.15	4.95	4.55	4.00	3.30	2.60
	5	Serviceability	10.94	7.43	4.51	2.59	1.55	1.07	0.88	0.72	0.54	0.37	0.19
		Strength	12.00	12.00	12.00	9.95	8.30	7.70	7.45	7.00	6.25	5.35	4.40

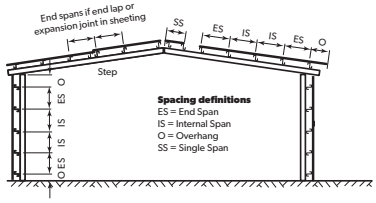
CUSTOM BLUE ORB® LIMIT STATE WIND PRESSURE CAPACITIES (KPA) 0.80 BMT

Span Type	Fasteners per sheet per support	Limit State	Span (mm)										
			600	900	1200	1500	1800	2100	2400	2700	3000	3300	3600
Single	3	Serviceability	5.26	3.92	2.80	2.08	1.49	0.99	0.53	-	-	-	-
		Strength	12.00	12.00	9.15	7.45	6.30	5.50	4.95	-	-	-	-
	5	Serviceability	12.00	8.63	3.44	1.54	0.64	0.40	0.50	-	-	-	-
		Strength	12.00	12.00	12.00	11.50	9.70	8.55	7.70	-	-	-	-
End	3	Serviceability	5.91	4.61	3.43	2.46	1.77	1.31	1.00	0.75	0.54	0.36	-
		Strength	12.00	12.00	11.50	8.55	6.80	6.00	5.45	4.80	4.00	3.15	-
	5	Serviceability	12.00	9.67	5.86	3.06	1.60	1.10	1.01	0.86	0.62	0.33	-
		Strength	12.00	12.00	12.00	12.00	9.85	8.80	8.25	7.00	6.20	4.85	-
Internal	3	Serviceability	5.49	4.53	3.66	2.94	2.38	1.93	1.56	1.24	0.96	0.70	0.46
		Strength	12.00	12.00	12.00	9.00	7.25	6.35	5.85	5.25	4.65	3.95	3.20
	5	Serviceability	12.00	12.00	6.86	3.23	1.61	1.45	1.37	1.36	1.15	0.80	0.40
		Strength	12.00	12.00	12.00	12.00	12.00	10.45	9.05	7.40	6.30	5.65	5.20

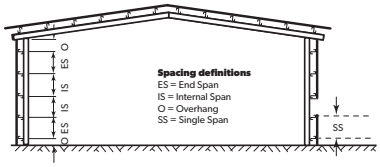
Support must not be less than 1mm BMT.

SPAN TYPES

Roofing & Walling Profiles



Walling Profiles Only



LIMIT STATES WIND PRESSURES

CUSTOM ORB® offers the full benefits of the latest methods for modelling wind pressures. The wind pressure capacity table is determined by full scale tests conducted at Lysaght'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 1.0mm, G550 steel.

For material less than 1.0mm thick, refer to the TOPSPAN® Quick Selection Guide, or seek advice from our information line.

ADVERSE CONDITIONS

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

MINIMUM ROOF PITCH

A special anti-capillary forming in the side-lap allow you to use CUSTOM ORB® (or CUSTOM BLUE ORB® used on curved surfaces) for roof pitches as low as 5° (1 in 12).

MAXIMUM ROOF LENGTHS FOR DRAINAGE MEASURED FROM RIDGE TO GUTTER

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

RAINFALL CAPACITIES (M)

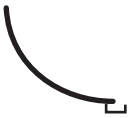
Peak Rainfall Intensity (mm/hr)	Roof Slopes (degrees)		
	5	7.5	10
100	29	34	38
150	20	23	25
200	15	17	19
250	12	14	15
300	10	11	13
400	7	8	10
500	6	7	8

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 1170.2:2011.

For information on the use of LYSAGHT® products in cyclonic conditions, refer to the Cyclonic Area Design Manual, which is available on our website: www.lysaght.com

THE CLASSIC CURVES OF CONTEMPORARY STYLE

Curving Styles	Description
	180° Barrel Vault
	Cranked Ridge
	Cranked Double Curve
	Bullnose
	Concave
	Convex
	Ogee
	Cyma Recta

INSTALLATION

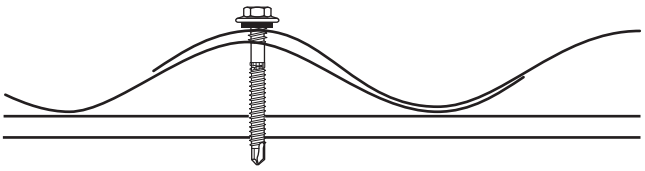
FASTENING SHEETS TO SUPPORTS

CUSTOM ORB® (and CUSTOM BLUE ORB®) are pierce-fixed to timber or steel supports. This means that fastener screws pass through the sheeting.

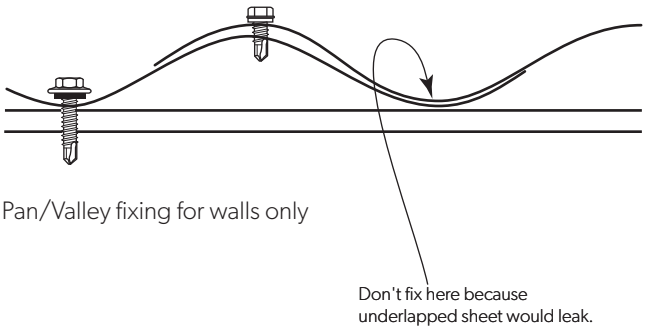
You can place screws through the crests or in the valleys. To maximise watertightness, always place roof screws through the crests. For walling, you may use either crest or valley-fixing.

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

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



Crest fixing for roof or walls



Pan/Valley fixing for walls only

SIDE-LAPS

CUSTOM ORB® (and CUSTOM BLUE ORB®) is overlapped at the sides not less than 1.5 corrugations. 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

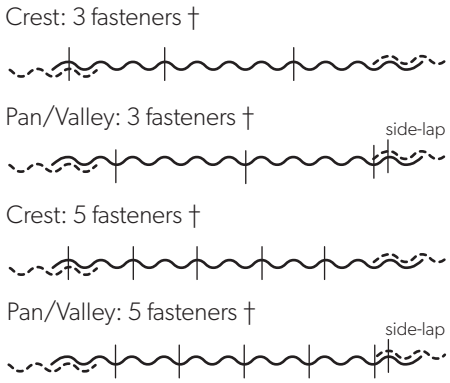
End-laps are not usually necessary because CUSTOM ORB® and CUSTOM BLUE ORB® are available in long lengths.

If you want end-laps, seek advice from our information line on the sequence of laying and the amount of overlap.

If you intend to end-lap CUSTOM ORB® (and CUSTOM BLUE ORB®), order the sheets at the same time and tell us you intend to lap them, to ensure a good fit of the profiles.

ENDS OF SHEETS

It is usual to allow roof sheets to overlap into gutters by about 50 mm. The valleys of sheets should be turned-down at lower ends, and turned-up at upper ends.



† Fasteners per sheet per support. Most common practice is:
3 fasteners for internal spans and 5 fasteners for single and end spans.

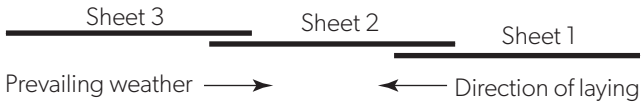
LAYING PROCEDURE

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.

Lay sheets toward prevailing weather. Also, 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 COVERAGE

Width of Roof (m)	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	30	40	50
Number of Sheets	4	6	7	8	10	11	12	14	15	16	18	19	20	21	23	24	25	27	40	53	66

FASTENERS WITHOUT INSULATION

	Fix to Steel Single & lapped steel thickness ≥0.55 up to 1.0mm BMT	Fix to Steel Single steel thickness ≥1.0mm BMT up to 3.0mm BMT	Fix to Steel Total lapped thickness ≥1.00 BMT up to 3.8mm BMT	Fix to Timber Hardwood J1-J3	Fix to Timber Softwood J4
Crest Fixed	Roof Zips M6-11x50	12-14x35, Metal Teks HG, HH or AutoTeks M5.5-14x39	12-14x35, Metal Teks HG, HH or AutoTeks M5.5-14x39	12-11x50, Type 17 HG, HH	12-11x50, Type 17 HG, HH or Roof Zips M6-11x50 HG, HH
Pan Fixed	10-16x16, Metal Teks, HH or M5-16x25 Designer Head or Roof Zips M6-11x25	10-16x16, Metal Teks, HH or M5-16x25 Designer Head	10-16x16, Metal Teks, HH	10-12x25, Type 17, HH M5-16x25 Designer Head or 12-11x25, Type 17, HH	10-12x30, Type 17, HH M5-16x25 Designer Head 12-11x25, Type 17, HH or Roof Zips M6-11x25
Side-laps	(If required) 10-16x16, Metal Teks, HH or Roof Zips M6-11x25 or M5-16x25 Designer Head or Sealed blind rivet ø4.8mm aluminium				

Notes:
1. For other steel thicknesses not specified please seek advice from screw manufacturer.
2. Values given are: gauge/threads per inch/ lengths (mm). HH = Hex. Head, WH = Wafer Head, HG = Hi-Grip
3. Care is required during installation to prevent stripping of thin material. (Single ply.)
4. Screw specification as above or equivalent fastener.
5. All screws with EPDM sealing washer.

WALKING ON ROOFS

When walking along the length of CUSTOM ORB®, walk only in the pans. When walking across the width of the sheeting, walk over or close to the roofing supports.

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.

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.

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 our information line.

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.

TURNING-UP CUSTOM ORB® OR CUSTOM BLUE ORB®

With pliers, multi-grips or a shifting spanner closed down to approximately 2mm, grip the valley corrugations 20mm in from the end of the sheet and turn up as far as possible. Be careful not to tear the sheet.

SEALED JOINTS

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

SIMPLE, LOW-COST FIXING

CUSTOM ORB® and CUSTOM BLUE ORB® can be fixed with hex head screws ensuring fast and simple installation with the recommended side-lap (one and a half corrugations).

SWARF

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.

PRODUCT DESCRIPTIONS

- All descriptions, specifications, illustrations, drawings, data, dimensions and weights contained in this catalogue, all technical literature and websites containing information from Lysaght are approximations only. They are intended by Lysaght to be a general description for information and identification purposes and do not create a sale by description. Lysaght reserves the right at any time to:

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