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# CUSTOM ORB<sup>®</sup> 990

Design and Installation Guide

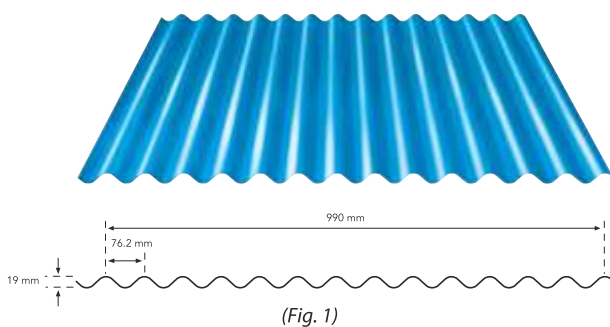


LYSAGHT CUSTOM ORB® 990 is a corrugated profile, with traditional and contemporary designs. It is a long, wide, strong, lightweight and economical profile that can be aligned quickly and easily. With all these features CUSTOM ORB® 990 simply offers outstanding value for money.

CUSTOM ORB® 990 is made of high strength steel and despite its lightness it provides excellent spanning capacity and remarkable recovery after deformation.

## Profile

CUSTOM ORB® is a 990 mm wide coverage profile with nominal 19 mm deep ribs and a pitch of nominal 76.2 mm centre to centre distance. (Refer Fig. 1)



## COLORBOND® steel with THERMATECH™ Technology

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 15%\*and also reduces peak roof temperature by up to 6°C\*\*.

## Material Specifications:

ZINCALUME® steel resin coated, minimum metallic coating mass is AZ150 (150g/m<sup>2</sup>), minimum yield strengths of G550 (550MPa) complies with AS1397 or IS15961.

COLORBOND® XRW is pre-painted steel for exterior roofing and walling. Its minimum metallic coating mass is AZ150 (150g/m<sup>2</sup>), minimum yield strength is G550 (550 MPa) with Super Durable Polyester exterior paint system and total 25um DFT on topside and 10um DFT on reverse side complying with AS/NZS 2728- type 4 or IS15965- class 3.

COLORBOND® Ultra is pre-painted steel for severe coastal or industrial environments (closer to source), minimum metallic coating mass is AZ200 (200g/m<sup>2</sup>), minimum yield strength is G550 (550MPa), Super

Durable Polyester exterior paint system, total 25um DFT on topside and 15um DFT on reverse side complying with AS/NZS 2728- type 4 or IS15965- class 3.

(Please contact Tata BlueScope Steel office for COLORBOND® spectrum series (metallic finish) and COLORBOND® XPD (PVDF) specification)

## Lengths

Sheets are supplied custom cut

## Tolerances

Length: + 10 mm, - 10 mm

Width: + 4 mm, - 4 mm

## Masses

CUSTOM ORB® 990				
BMT*	TCT*	Product	kg/m	kg/m <sup>2</sup>
0.42	0.47	ZINCALUME® steel	4.21	4.26
0.42	0.47	COLORBOND® XRW steel	4.29	4.33
0.45	0.50	ZINCALUME® steel	4.50	4.55
0.45	0.50	COLORBOND® XRW steel	4.57	4.62

\* Dimensions are in mm

## 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 consider resistance to wind pressure only.

The pressure considered (in accordance with IS 875.3) is based on buildings up to 10 m high, Zone 3 (Basic wind

Maximum Support Spacings (mm)		
	Total Coated Thickness (mm)	
	0.47	0.50
<b>Roofs</b>		
Single Span	690	750
End Span	950	1100
Internal Span	1200	1400
Unstiffened eaves overhang	150	200
Stiffened eaves overhang	250	300
<b>Walls</b>		
Single Span	1000	1100
End Span	1000	1250
Internal Span	1300	1500
Overhang	200	250

• For roofs, the data are based on foot-traffic loading  
 • For walls, the data are based on pressures (see pressure table)  
 • Tables are based on supports of 1 mm BMT  
 • Please contact Tata BlueScope Steel office before adopting for design

speed  $V_b = 47\text{m/s}$ ), Class A, Terrain category 3,  $K_1 = 1.0$ ,  $K_2 = 0.91$ ,  $K_3 = 1.0$ , with the following assumptions made;

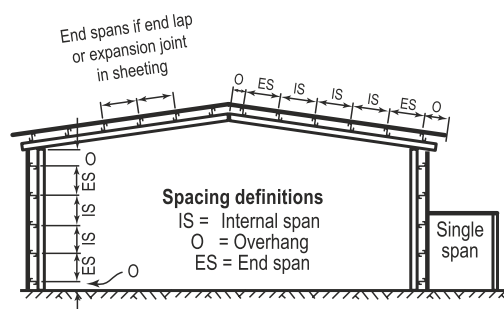
### Roofs:

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

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

$C_{pi} = +0.2$

### Span Types:



### 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 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 Steel office.

Maximum Roof Run (m) as based on CSIRO* Formula							
	Rainfall Intensity mm/hr	Roof Slope					
		1°	2°	3°	5°	7.5°	10°
LYSAGHT	100	-	-	-	28	32	36
CUSTOM ORB® 990	150	-	-	-	18	21	24
Flow Area = 178 m <sup>2</sup>	200	-	-	-	14	16	18
	250	-	-	-	11	13	14
	300	-	-	-	9	11	12
	400	-	-	-	7	8	9
	500	-	-	-	6	6	7

\*Commonwealth Scientific & Industrial Research Organisation

### Limit state wind pressure

CUSTOM ORB® 990 offers the full benefits of the latest methods for modeling wind pressures. The wind pressure capacity table is determined by full-scale tests 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 Pressure for Noncyclonic Regions.

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

### Storage and handling

Keep the product dry and clear of the ground. If stacked or bundled product becomes wet, separate and 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.

### Sealed joints

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

### 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 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 Steel office for designs used in cyclonic areas.



CUSTOM ORB® 990: Limit state wind pressure capacities (kPa)										
Span Type	Fasteners per sheet per support		Span (mm)							
			600	900	1200	1500	1800	2100	2400	2700
CUSTOM ORB® 990 - 0.40 mm Base Metal Thickness (0.45 mm Total Coated Thickness)										
SINGLE	4	Serviceability	1.33	1.16	0.91	0.62	0.29	-	-	-
		Strength*	9.60	5.76	3.94	3.11	3.04	-	-	-
	6	Serviceability	2.36	2.06	0.95	0.45	0.25	-	-	-
		Strength*	9.60	9.60	7.56	5.97	5.27	-	-	-
END	4	Serviceability	1.09	0.88	0.66	0.47	0.33	0.22	0.15	0.10
		Strength*	4.94	4.64	3.88	3.18	2.07	1.46	1.19	0.99
	6	Serviceability	3.07	2.97	2.17	0.92	0.47	0.22	0.11	0.11
		Strength*	9.60	9.60	5.96	3.19	2.50	2.01	1.57	1.32
INTERNAL	4	Serviceability	1.46	1.07	0.80	0.62	0.52	0.47	0.43	0.39
		Strength*	8.47	6.56	4.98	3.77	3.09	2.51	2.19	1.97
	6	Serviceability	3.73	3.47	2.55	1.45	1.01	0.55	0.47	0.32
		Strength*	9.60	9.60	9.60	7.52	5.07	4.23	3.49	2.90
CUSTOM ORB® 990 - 0.45 mm Base Metal Thickness (0.50 mm Total Coated Thickness)										
SINGLE	4	Serviceability	1.81	1.37	1.04	0.73	0.49	-	-	-
		Strength*	10.80	8.28	5.56	4.48	4.32	-	-	-
	6	Serviceability	5.79	3.12	1.79	0.99	0.46	-	-	-
		Strength*	10.80	10.80	9.41	7.54	6.98	-	-	-
END	4	Serviceability	1.61	1.38	1.20	1.06	0.91	0.76	0.60	0.44
		Strength*	9.38	7.47	5.72	4.25	3.38	2.77	2.39	2.09
	6	Serviceability	6.34	4.06	2.54	1.60	1.08	0.73	0.49	0.33
		Strength*	10.80	10.80	9.86	8.17	6.19	4.82	3.87	3.29
INTERNAL	4	Serviceability	1.75	1.63	1.48	1.28	1.08	0.86	0.68	0.53
		Strength*	10.51	8.73	7.18	5.90	4.75	3.80	3.06	2.52
	6	Serviceability	7.20	4.65	3.45	2.48	1.74	1.18	0.78	0.51
		Strength*	10.80	10.80	10.80	10.26	8.93	7.09	5.58	4.39

**Strength:** \*A capacity reduction factor of  $\phi=0.9$  has been applied to strength capacities. Supports must not be less than 1 mm BMT  
 Non standard colours and sizes are also available on special request.  
 The above data has been derived from tests conducted at our research centre and reproduction of the same in any form is strictly prohibited.  
 Please contact Tata BlueScope Steel office before adopting for design.

# Installation

## Fastening sheets to supports

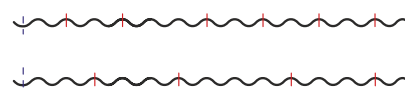
CUSTOM ORB® 990 is pierce-fixed to steel or timber supports. This means that fastener screws pass through the sheeting. To maximize water tightness, always place roof screws through the crests. For walling, you may use either crest- or valley fixing. (Please refer fig. 2)

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

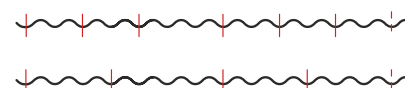
## Side-laps

CUSTOM ORB® 990 standard lap is 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.

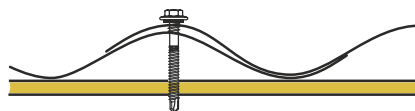
**Roof** - Screw fix through pan



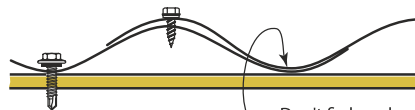
**Wall** - Screw fix through pan



Crest fixing for roof or walls



Valley fixing for walls only



(Fig. 2)



## End lapping

End-laps are not usually necessary because CUSTOM ORB® 990 is available in long lengths. If endlaps are used, complete each run of sheets from gutter to ridge.

Seal end lap at both ends with a 3 mm bead of neutral cure silicone sealant.

For roofs, allow a minimum end-lap of 200 mm for pitches of 5 to 15 degrees, and 150 mm for pitches above 15 degrees. For walls, allow minimum endlaps of 100 mm.

Where you intend to end-lap CUSTOM ORB® 990 sheeting with curved sections of CUSTOM ORB® 990, order them at the same time to ensure a good fit.

## 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. Use five fastenings at the ends of sheets.

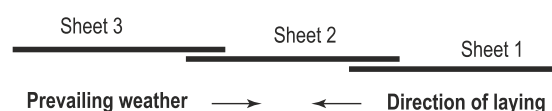
## Laying procedure

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. 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.



Fasteners without insulation				
Support Details	Number of Fasteners		Crest Fixing Roof & Wall Application	Valley Fixing Wall Application only
	Per Sheet/support	Per sq. mt.		
Steel up to 0.75 mm BMT	5	5	13 - 13 x 55, Batten Tekes HG, Hex Head 12 - 14 x 45, Metal Tekes HG, Hex Head 12 - 11 x 65, Type 17 HG, Hex Head 12 - 11 x 50, Type 17 HG, Hex Head	10-16 x 16 Metal Tekes, Hex Head 10-16 x 16 Metal Tekes, Hex Head 10-12 x 30, Type 17 HG, Hex Head 10-12 x 20, Type 17 HG, Hex Head
Steel > 0.75 mm BMT up to 3 mm BMT				
Timber - Softwood				
Timber - Hardwood				

**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 sq.m and are only for guidance, based on support spaced at 1 m and wall 0.6 m
3. HG refers to Hi-Grips
4. Please refer to the above data for guidance purpose only. You may contact Tata BlueScope Steel office for further information





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## Benefits

- Product especially suited for contemporary buildings
- Smooth sinusoidal shape preferred for superior aesthetics
- Short roof run, steep roof slopes (7 degree and above)
- CUSTOM ORB® can be curved smoothly for modern & stylish architectural designs. It can be pre-curved in the factory by a machine with a minimum radius of 500 mm
- Can be used for wall cladding applications in horizontal direction
- G300 has a gentle curve in it's shape. The extra ductility of LYSAGHT CUSTOM ORB® 990 allows easy curving without distortion of the profile, and without damage to the finish

## 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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- This publication is intended to be an aid for all trades and professionals involved with specifying and installing LYSAGHT® products and not to be a substitute for professional judgement
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## Standard Colour Range

Explore More



The above colours are only for illustrative purpose and actual colours may vary.

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