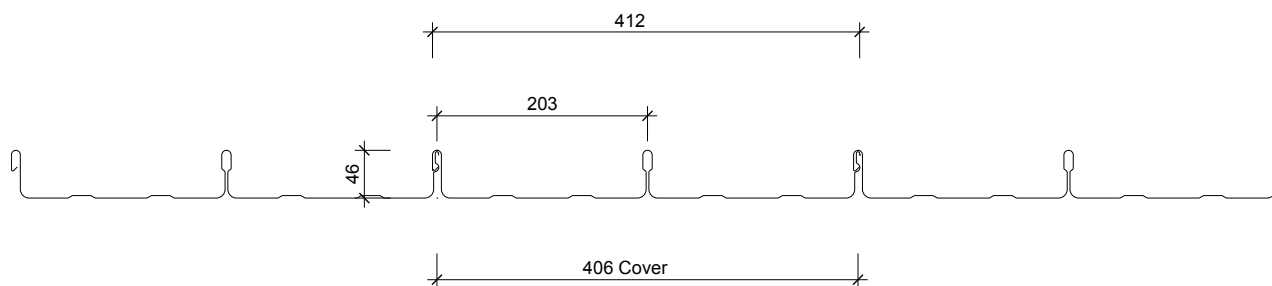


DIMONDEK® 400 PROFILE PERFORMANCE



Cover (mm)	406
Sheet width (mm)	412
Minimum Pitch	3° (approx. 1:20)

All dimensions given are nominal

Sheet Tolerances

Sheet width: ±5mm

Sheet length: +10mm, -0mm. For horizontal wall cladding where notified at time of order of intended use, tighter tolerances can be achieved +3mm, -0mm.

Material Options	Steel	Aluminium	Copper*
Thickness (BMT) mm	0.55	0.75	0.9
Nominal weight/lineal metre (kg/m)	2.77	3.73	1.48
Drape curved roof - min. radius (m)**	70	70	70
Purlin spacings for drape curved roof (m)(1)	1200	1500	900
Machine crimp curved - roof min. radius (mm)	n/a	n/a	n/a
Unsupported overhang (2)(mm)	250	300	200

*Dimondek® 400 is available in Copper ex Auckland only, subject to coil availability.

**To achieve a high level of appearance on the completed roof, it is important that the purlin layout alignment is laid within the tolerances as stated in Section 2.4.2.3.1.

(1) Recommended maximum purlin spacing at minimum radius

(2) Based on 1.1kN point load support, but not intended for roof access.

n/a – not available

Roll-forming facilities for Dimondek® 400 at: Auckland, Hamilton, Wellington, Christchurch, and a mobile machine based in Hamilton which can be moved to site as required.

Sheet lengths: Dimondek® 400 is custom run to order.

Where long sheets are used consideration must be given to:

- Special transportation licences for sheet lengths over 25m
- Site access for special lifting equipment
- Fixing techniques to accommodate thermal expansion. Refer Section 2.1.3.4.
- Possibility of manufacturing sheets on site – sheet lengths up to 100m long are possible when rolled on site.

Call 0800 400 222 to discuss.

DIMONDEK® 400 LIMIT STATE LOAD / SPAN CAPACITY CHART

(span in mm, distributed ultimate loads in kPa)

Serviceability Category

		Unrestricted-Access Roof		Restricted-Access Roof			Non-Access Roof or Wall	
G300 Steel 0.55mm	End Span	600	800		900	1100	1100	1400
	Internal Span	900	1200		1300	1600	1700	2100
	Ultimate ⁵	2.0	1.7		1.6	1.4	1.3	1.0
G300 Steel 0.75mm	End Span	800	1000	1100	1300	1500	1500	
	Internal Span	1200	1500	1600	1900	2200	2300	
	Ultimate ⁵	2.0	1.8	1.7	1.5	1.3	1.2	
5052 H36 Aluminium 0.90mm	End Span	400	600		700	900	900	1100
	Internal Span	600	900		1000	1300	1400	1700
	Ultimate ⁵	2.7	2.1		1.9	1.6	1.5	1.0
½ hard Copper 0.55mm	End Span		700		700	900	1000	
	Internal Span		1000		1100	1400	1500	
	Ultimate ⁵		1.9		1.8	1.5	1.4	

*Subject to availability

Notes

- In any category, spans above the maximum shown should not be used. Category 1 and 2 maximum spans are based on static point load testing as a guide, and further limited by practical experience of roof performance under dynamic foot traffic loads. Category 3 maximum spans are limited as a guide to achieving satisfactory appearance for wall cladding.
- Loads given are based on clip fastening every rib at every purlin.
- If design requirements exceed the loads given above, the push on Dimond wind clamps can be installed to double the wind uplift load.
- N/R = not recommended.
- For the purposes of serviceability design, the serviceability limit, limited by permanent rib deformation, occurs essentially at the same load as ultimate failure which is the point of disengagement of the roof with the clip.
- End span capacities given in this table are based on the end span being $\frac{2}{3}$ of the internal span.
- Design Criteria for Limit State Capacities**
 - Serviceability Limit State**
No deflection or permanent distortion that would cause unacceptable appearance, side lap leakage or water ponding, due to foot traffic point loads, inward or outward wind loads or snow loads.
 - Ultimate Limit State**
No pull through of fixings or fastener withdrawal resulting in sheet detachment due to wind up-lift (outward) loads.
- System Design**
The span capacity of Dimondek® 400 is determined from the Dimondek® 400 Limit State Load/Span Capacity Chart using the section of the chart appropriate to the grade and type of material, and to the category of serviceability selected from the three categories below. It is recommended that to obtain a dependable design strength capacity for the ultimate limit state, a reduction factor of $\phi = 0.8$ is applied.
The capacities given do not apply for cyclonic wind conditions.

Serviceability Requirements
While these categories are given for design guidance to meet the serviceability limit state criteria, foot traffic point load damage may still occur if there is careless placement of these point loads.

Service Category	Description
1. Unrestricted-access roof	Expect regular foot traffic to access the roof for maintenance work and able to walk anywhere on the roof. No congregation of foot traffic expected.
2. Restricted-access roof	Expect occasional foot traffic educated to walk only on the purlin lines, in the profile pans, or carefully across two profile ribs. Walkways installed where regular traffic is expected, and "Restricted Access" signs placed at access points.
3. Non-access roof or wall	Walls or roofs where no foot traffic access is possible or permitted. If necessary, "No Roof Access" signs used.
- Wind Pressure Guide**
As a guide for non-specific design the following S.L.S. design loads in accordance with the MRM Roofing Code of Practice can be used for buildings less than 10m high, otherwise AS/NZS 1170.2 should be used
Low wind zone = 0.68kPa, Medium wind zone = 0.93kPa, High wind zone = 1.32kPa, Very high wind zone = 1.72kPa and Extra high wind zone = 2.09kPa.

Fastener Design

Dimondek® 400 is clip-fastened to either timber or steel purlins. The use of the appropriate type and length of fastener for clip fixing will ensure failure by fastener pull out will not occur under loads within the scope of the Limit State Load / Span Capacity Chart.

Purlin Type	Clip Fastener
Timber	10g x 45mm timbertite wafer head screw or T17 M4x75mm pan head for fixing through Cavibats and 17.5mm thick ply
Steel	10g x 16mm wafer head screw

*If sarking or insulation is used over the purlins or for wall cladding fixing onto a cavity batten, into the stud, the screw length will need to be increased.

For screw size range refer Section 2.2.3.1.

Underslung Fixing

- When using Dimondek® 400 as an underslung roof, the ribs are required to be fixed under the steel structure, using a Dimond stainless steel tee bolt and stainless steel clip with neo's on every rib.
- There should be 1 row of clips on each structural member, each alternating side of the flange to avoid the Dimondek® 400 falling off the structural steel.
- It is important to pre drill a 5mm diameter hole, through the centre of each rib of Dimondek® 400, within 10mm of the edge of the structural steel member.
- For roofing lengths over 18m, an allowance for thermal expansion must be made.
- From the underside the tee bolt is then passed through the hole in the Dimondek® 400, a neo seal fitted, then the clip is secured against and on top of the flange of the structural steel, before a neo seal washer and lock nut are tightened down, to compress the seals and hold the clip in place.

The Limit State Load / Span Capacity Chart is based on every rib being clip fastened to every purlin.

Design Example

Restricted access roof, 0.55mm G300 steel Dimondek® 400 has a maximum end span of 1100mm and a maximum internal span of 1600mm. The following distributed load capacities apply.

End Span	1100mm
Internal Span	1600mm
Ultimate	1.4 kPa