2.4.1.1.5 LOAD SPAN DESIGN

Table 2.4K provides the maximum spans for each product type Glasslite, Maxilite, Durolite, in all the grades such as clear, HG and FG for each profile and sheet thickness limited by the ultimate limit state capacities given. The load span data is based on the number of fasteners/sheet/purlin given. The load capacities apply to both inward and outward uniformly distributed loads. Table 2.4K does not cover Natural Lighting Systems intended to support concentrated loads (e.g. foot traffic). Consult Dimond for alternative systems if design consideration is to be given to concentrated load support.

Fastener Design

Dimond Natural Lighting sheets must be fixed with screw fasteners of the same type and length for the matching metal sheeting. The fastener frequency should be specified according to Table 2.4K.

Weatherlok roofing washers may be used to achieve a seal and to spread wind uplift reaction loads. For roofs with design wind loads close to the maximum values below or above 2.0 kPa, use the matching metal profiled washer and 36Ø EPDM seal. Side lap stitching and pre-drilled oversize holes may be required (refer Section 2.4.1.3.2).

Table 2.4K Natural Lighting Systems – Load / Span / Fastener Design

			Maximum Internal Span (mm) End Span = 0.7 x Internal Span			Fasteners per sheet per perlin	
Profile	Gauge (mm)	Nominal Sheet Weight/m² Kg/m²	U.L.S[5] 1.0 kPa	U.L.S[5] 1.5 kPa	U.L.S[5] 2.0 kPa	End Span	Internal Span
Corrugate Min pitch 8°	1.1	1.8	1200	1000	900	5	3
	1.4	2.4	1400	1200	1000	5	3
	1.7	3.0	1500	1300	1200	5	3
Veedek/Styleline Min pitch 3°	1.1.	1.8	1400	1200	1000	4	4
	1.4	2.4	1700	1500	1200	4	4
	1.7	3.0	1900	1700	1400	4	4
V-Rib Min pitch 4°	1.1.	1.8	1400	1200	1000	5	3
	1.4	2.4	1700	1500	1200	5	3
	1.7	3.0	1900	1700	1400	5	3
LT7 Min pitch 3°	1.1.	1.8	1600	1400	1300	7	4
	1.4	2.4	1900	1700	1500	7	4
	1.7	3.0	2100	1800	1700	7	4
BB900 Min pitch 3°	1.1.	1.8	1700	1400	1300	6	3
	1.4	2.4	2000	1700	1500	6	3
	1.7	3.0	2300	1900	1700	6	3
DP955 Min pitch 3°	1.1.	1.8	1400	1000	750	3	3
	1.4	2.4	1900	1300	900	3	3
	1.7	3.0	2500	1600	1200	3	3
SS900/Topspan Min pitch 3°	1.1.	1.8	1800	1600	1400	4	4
	1.4	2.4	2000	1800	1400	4	4
	1.7	3.0	2300	2000	1700	4	4
Super Six Min pitch 3°	1.1.	1.8	1800	1400	1200	4	4
	1.4	2.4	2000	1600	1400	4	4
	1.7	3.0	2300	1800	1600	4	4
Dimondek 400 Min pitch 3°	0.75	1.9	1400	1200	1000	1 Clip	1 Clip
	0.9	2.3	1600	1400	1200	1 Clip	1 Clip
Dimondek 630 Min pitch 3°, see note 6.	1.4	2.4	900	900	900	3	3
	1.7	3.0	900	900	900	3	3

Note:

1. The spans given are for internal purlin spacings.
2. The tabulated data does not apply to single spans. Single spans must be reduced to 0.5 x internal span.
3. These spans apply where the Natural Lighting sheets are installed with both side edges supported by an adjacent metal roof.
4. For continuous coverage of two or more Natural Lighting sheets we recommend reducing the spans 0.9 x Internal spans.
5. U.L.S. = Ultimate Limit State Capacity.
6. Span for Dimondek 630 is limited by the side lap fastener to either mid span support or purlin, at centres shown above up to a maximum number of 2 mid span supports.

2.4.1.1.5 Continued

Mid Span Support
Whenever the span capability of the Dimond Natural Lighting product does not match the purlin spacing used for the adjoining metal sheets, a mid span support must be used. The sheets must be fastened to the mid span support in the same manner as they are fastened to the purlins. Mid span supports are required to reduce sheet flutter due to wind loads and are not intended to support concentrated loads.

½ Sheet Widths Spans
The use of profiled 1/2 sheet widths, lapping over the side of the steel sheets, allow the spans of the selected profile Natural Lighting sheet to be increased by up to 40%, while still achieving the same ultimate limit state capacity, before needing mid supports. Half width sheets must have side lap stitching as shown in Table 2.4M, Section 2.4.1.3.2.

2.4.1.1.6 CONDENSATION CONTROL & INSULATION

Condensation can occur on the underside of Natural Lighting sheet when the building is not sufficiently ventilated or moisture is generated within the building space.
The following three methods are recommended options to help reduce the effect of condensation that may form on Natural Lighting.

1. Install a system that incorporates Dimond Skylight film as a translucent underlay. Refer 2.4.1.1.10 Detailed Drawings Fig. 1. This is a low performance system which in the extreme cases of low exterior temperatures, condensation may still form on the underside of the skylight film. Otherwise the skylight film is intended to carry condensation moisture dripping from the underside of the Natural Lighting sheet to the outside of the building, similar to building paper.
2. Install a system that incorporates a double skin of Natural Lighting sheeting with an air gap between. In colder climates the air gap provides additional insulation and reduces the likelihood of condensation forming on the underside of the inner surface.

For additional design considerations relating to condensation control by ventilation, refer to Section 2.4.4.

2.4.1.1.7 FIRE RESISTANCE

The fire resistance properties of the Natural Lighting products have been evaluated by recognised Fire Safety Consultants, resulting in the opinion that Durolite can be used within the New Zealand Building Code requirements for fire safety given the following guidelines.

Durolite FireGuard 2 (FG2) and Durolite FireGuard 3 (FG3) are manufactured with fire retardant polyester resin and have been tested by BRANZ. Durolite FG3 uses a bromine free formulation.

Durolite FG2 achieves a Group 2 Number classification to the NZBC verification method C/VM2 appendix A.

Durolite FG3 achieves a Group 3 Number classification to the NZBC verification method C/VM2 appendix A.

BRANZ Test Report FH 5552-TT for FG2 and BRANZ Test Report FH 5553-TT for FG3 are available upon request. Contact Dimond on 0800 ROOFSPEC (0800 766 377).

Durolite FG2 and FG3 are available in all profiles and standard colour tint options, e.g. HG4.