DrJ CERTIFICATION

Technical Evaluation Report™

A Duly Authenticated Report from an Approved Agency

Report Number 2405-112

Performance Characteristics of Owens Corning® (OC™) Lumber - Canada

Owens Corning®

Product:
Owens Corning Lumber

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Company Information:

Owens Corning
1 Owens Corning Pkwy Ste 2C
Toledo, OH 43659-1000
Phone: 419-248-7236 or 1-800-GET-PINK
Email: oclumber@owenscorning.com
Website: www.owenscorning.com

CSI Designations:

DIVISION: 06 00 00 - WOOD, PLASTICS AND COMPOSITES

Section: 06 05 23 - Wood, Plastic, and Composite Fastenings | Section: 06 73 00 - Composite Decking | Section: 06 73 13 - Composite Structural Decking

1 Innovative Product Evaluated[1]

1.1 Owens Corning Lumber

2 Applicable Codes and Standards[2]

2.1 *Codes*

2.1.1 *NBC—10, 15, 20: National Building Code of Canada*

2.1.2 *O Reg. 332/12: Ontario Building Code (OBC)*[3]

2.2 *Standards and Referenced Documents*

2.2.1 *ASTM D198: Standard Test Methods of Static Tests of Lumber in Structural Sizes*

2.2.2 *ASTM D1037: Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials*

2.2.3 *ASTM D6109: Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastic Lumber and Related Products*

2.2.4 *ASTM D7147: Standard Specification for Testing and Establishing Allowable Loads of Joist Hangers*

2.2.5 *ASTM E84: Standard Test Method for Surface Burning Characteristics of Building Materials*

3 Performance Evaluation

3.1 Testing and related engineering evaluations are defined as intellectual property and/or trade secrets.[4]

3.2 Engineering evaluations are conducted within DrJ's ANAB accredited ICS code scope, which are also its areas of professional engineering competence.[5]

3.3 Owens Corning Lumber (also known as OC Lumber) was tested and/or evaluated for:

3.3.1 Structural capacities for gravity loads when used as deck posts, joists, beams, and headers.

3.3.1.1 Edgewise flexural testing in accordance with ASTM D198 and ASTM D6109 where the use is for joists, beams, and headers.

3.3.1.2 Axial compression testing in accordance with ASTM D198 where the use is for posts.

3.3.1.3 Connection capacities of composite deck screws in accordance with ASTM D1037.

3.3.1.4 Vertical load-bearing capacities of hanger connections in accordance with ASTM D7147.

3.3.1.5 Surface burning characteristics in accordance with CAN/ULC-S102 equivalent.

3.4 Any regulation specific issues not addressed in this section are outside the scope of this report.

4 Product Description and Materials

4.1 The innovative product evaluated in this report is shown in **Figure 1** and is described in **Table 1**.

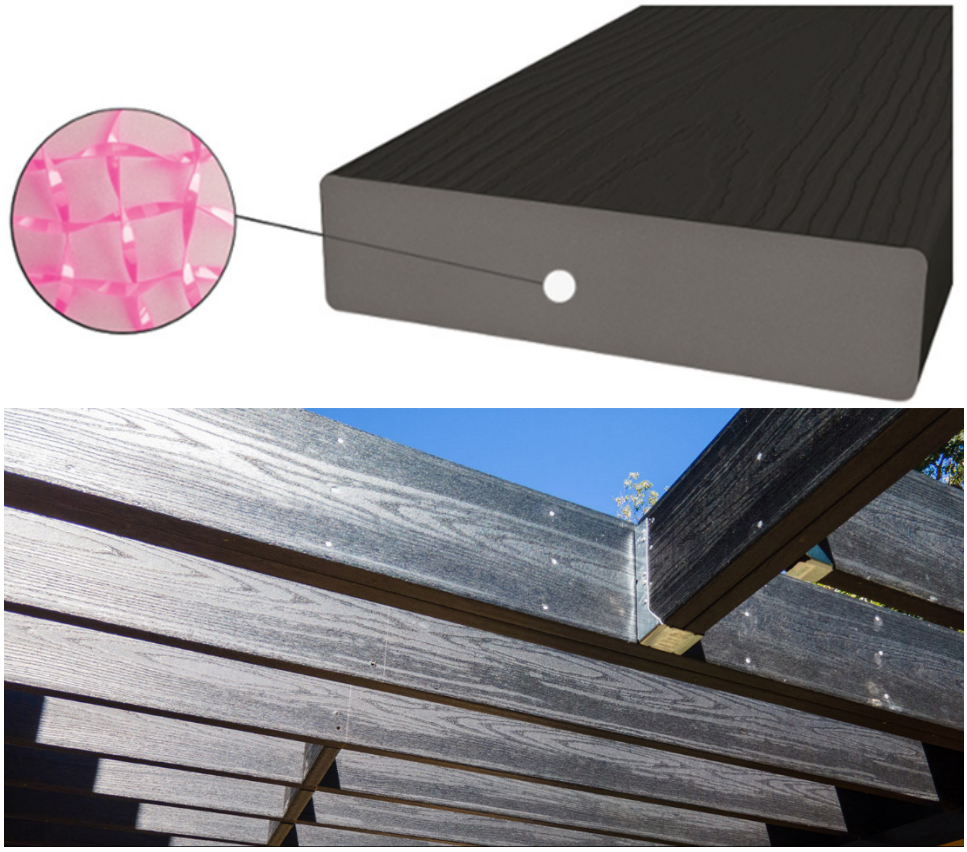


Figure 1. Owens Corning Lumber

Table 1. Description of Owens Corning Lumber Structural Composite Lumber

Owens Corning Lumber	Description
Product Type	Continuous Glass fiber, Advantex® Fiberglas™, reinforced High Density Polyethylene (HDPE) with less than twenty-five percent (25%) calcium carbonate in base HDPE resin. ≥ 5% of overall total weight is fibrous glass < 2.5% by weight of organic surface binder
Application	Reinforced and semi-reinforced extruded products for use in non-structural and structural applications.
Joists (Owens Corning Lumber Structural Framing)	Reinforced polymeric lumber for joist applications (edgewise orientation) available in the following sizes in [mm]: 38 x 140, 38 x 190, 38 x 235, and 38 x 285 Nominal sizes: 2 x 6, 2 x 8, 2 x 10, and 2 x 12
Decking (Owens Corning Lumber WEARDECK™ Decking)	Reinforced polymeric lumber for decking applications (flatwise orientation) available in the following sizes in [mm]: 26 x 140, 26 x 185, and 35 x 140
Imperial Units: 1 mm = 0.0394 in	

5 Applications

5.1 Owens Corning Lumber was tested and/or evaluated for:

5.1.1 Structural capacities for gravity loads of when used as deck posts, joists, beams, headers, and stair stringers

5.1.2 Fastener and hanger connection capacities

5.1.3 Flame spread

5.2 Decks shall be supported on footings designed in accordance with NBC Subsection 9.15.3 and Section 9.17.

5.2.1 Bottom of posts shall be restrained to prevent lateral displacement as specified in NBC Article 9.17.2.2.

5.2.1.1 In accordance with CSA O86 Section 6.5.3.2.3, the lateral-stability factor K_L may be taken as unity if the maximum depth-to-width ratio of the member does not exceed 6.5:1.

5.2.2 Maximum allowable joist spans are provided in **Table 2** through **Table 5**.

5.2.2.1 **Table 2** provides the maximum allowable joist span based on a live load (LL) of 1.92 kPa

5.2.2.2 **Table 3** provides the maximum allowable joist span based on a live load (LL) of 2.87 kPa

5.2.2.3 **Table 4** provides the maximum allowable joist span based on a live load (LL) of 3.83 kPa

5.2.2.4 **Table 5** provides the maximum allowable joist span based on a live load (LL) of 4.79 kPa

Table 2. Maximum Joist Spans (m) and Cantilever Lengths (cm) Using Owens Corning Lumber at Various Deflection Limits – 1.92 kPa LL[3,4]

Owens Corning Lumber Profile	Joist Spacing (mm o.c.)	Deflection Limits									
		L/360		L/240		L/180		L/150		L/120	
		Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever
2" x 6"	305	2.0	15.2	2.3	20.3	2.5	25.4	2.6	27.9	2.8	33.0
	405	1.8	17.8	2.1	22.9	2.3	27.9	2.4	30.5	2.6	35.6
	610	1.6	17.8	1.8	25.4	2.0	30.5	2.1	33.0	2.3	38.1
2" x 8"	305	2.7	27.9	3.1	38.1	3.4	45.7	3.6	50.8	3.9	58.4
	405	2.4	30.5	2.8	40.6	3.1	48.3	3.3	55.9	3.5	61.0
	610	2.1	35.6	2.4	45.7	2.7	53.3	2.9	61.0	3.1	61.0
2" x 10"	305	3.3	43.2	3.8	55.9	4.2	61.0	4.4	61.0	4.8	61.0
	405	3.0	48.3	3.4	61.0	3.8	61.0	4.0	61.0	4.3	61.0
	610	2.6	53.3	3.0	61.0	3.3	61.0	3.5	61.0	3.8	61.0
2" x 12"	305	3.9	61.0	4.5	61.0	5.0	61.0	5.3	61.0	5.7	61.0
	405	3.6	61.0	4.1	61.0	4.5	61.0	4.8	61.0	5.2	61.0
	610	3.1	61.0	3.6	61.0	3.9	61.0	4.2	61.0	4.5	61.0

Imperial Units: 1 m = 3.281 ft, 1 mm = 0.0398 in

1. Joist spacing is based on a design live load of 1.92 kPa (40 psf).
2. Maximum cantilever based on twice the joist span deflection limit and a 99.8 kg (220 lb) point load applied to the end. Joist cantilever shall be limited to 0.61 m (2' 0"), a cantilever length that results in twice the deflection limit for the main span, or twenty-five percent (25%) of the length of the joist span, whichever is less.
3. Owens Corning decks use proprietary materials and conditions not prescribed in CSA O86.
4. Joist spacing is based on a temperature factor of 1.0.

Table 3. Maximum Joist Spans (m) and Cantilever Lengths (cm) Using Owens Corning Lumber at Various Deflection Limits – 2.87 kPa LL[3,4]

Owens Corning Lumber Profile	Joist Spacing (mm o.c.)	Deflection Limits									
		L/360		L/240		L/180		L/150		L/120	
		Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever
2" x 6"	305	1.7	17.8	2.0	22.9	2.2	27.9	2.3	30.5	2.5	35.6
	405	1.6	17.8	1.8	25.4	2.0	30.5	2.1	33.0	2.3	38.1
	610	1.4	20.3	1.6	27.9	1.7	33.0	1.8	38.1	2.0	43.2
2" x 8"	305	2.4	33.0	2.7	43.2	3.0	50.8	3.1	55.9	3.4	61.0
	405	2.1	35.6	2.4	45.7	2.7	53.3	2.9	61.0	3.1	61.0
	610	1.9	38.1	2.1	50.8	2.4	58.4	2.5	61.0	2.7	61.0
2" x 10"	305	2.9	48.3	3.3	61.0	3.6	61.0	3.9	61.0	4.2	61.0
	405	2.6	53.3	3.0	61.0	3.3	61.0	3.5	61.0	3.8	61.0
	610	2.3	55.9	2.6	61.0	2.9	61.0	3.1	61.0	3.3	61.0
2" x 12"	305	3.4	61.0	3.9	61.0	4.3	61.0	4.6	61.0	5.0	61.0
	405	3.1	61.0	3.6	61.0	3.9	61.0	4.2	61.0	4.5	61.0
	610	2.7	61.0	3.1	61.0	3.4	61.0	3.7	61.0	3.9	61.0

Imperial Units: 1 m = 3.281 ft, 1 mm = 0.0398 in

1. Joist spacing is based on a design live load of 2.87 kPa (60 psf).
2. Maximum cantilever based on twice the joist span deflection limit and a 99.8 kg (220 lb) point load applied to the end. Joist cantilever shall be limited to 0.61 m (2' 0"), a cantilever length that results in twice the deflection limit for the main span, or twenty-five percent (25%) of the length of the joist span, whichever is less.
3. Owens Corning decks use proprietary materials and conditions not prescribed in CSA O86.
4. Joist spacing is based on a temperature factor of 1.0.

Table 4. Maximum Joist Spans (m) and Cantilever Lengths (cm) Using Owens Corning Lumber at Various Deflection Limits – 3.83 kPa LL[3,4]

Owens Corning Lumber Profile	Joist Spacing (mm o.c.)	Deflection Limits									
		L/360		L/240		L/180		L/150		L/120	
		Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever
2" x 6"	305	1.6	17.8	1.8	25.4	2.0	30.5	2.1	33.0	2.3	38.1
	405	1.4	20.3	1.6	27.9	1.8	33.0	1.9	35.6	2.1	40.6
	610	1.2	22.9	1.4	30.5	1.6	35.6	1.7	40.6	1.8	43.2
2" x 8"	305	2.1	35.6	2.4	45.7	2.7	53.3	2.9	61.0	3.1	61.0
	405	1.9	38.1	2.2	48.3	2.4	58.4	2.6	61.0	2.8	61.0
	610	1.7	40.6	1.9	48.3	2.1	50.8	2.3	55.9	2.4	61.0
2" x 10"	305	2.6	53.3	3.0	61.0	3.3	61.0	3.5	61.0	3.8	61.0
	405	2.4	55.9	2.7	61.0	3.0	61.0	3.2	61.0	3.4	61.0
	610	2.1	50.8	2.4	58.4	2.6	61.0	2.8	61.0	3.0	61.0
2" x 12"	305	3.1	61.0	3.6	61.0	3.9	61.0	4.2	61.0	4.5	61.0
	405	2.8	61.0	3.2	61.0	3.6	61.0	3.8	61.0	4.1	61.0
	610	2.5	61.0	2.8	61.0	3.1	61.0	3.3	61.0	3.6	61.0

Imperial Units: 1 m = 3.281 ft, 1 mm = 0.0398 in

1. Joist spacing is based on a design live load of 3.83 kPa (80 psf).
2. Maximum cantilever based on twice the joist span deflection limit and a 99.8 kg (220 lb) point load applied to the end. Joist cantilever shall be limited to 0.61 m (2' 0"), a cantilever length that results in twice the deflection limit for the main span, or twenty-five percent (25%) of the length of the joist span, whichever is less.
3. Owens Corning decks use proprietary materials and conditions not prescribed in CSA O86.
4. Joist spacing is based on a temperature factor of 1.0.

Table 5. Maximum Joist Spans (m) and Cantilever Lengths (cm) Using Owens Corning Lumber at Various Deflection Limits – 4.79 kPa LL[3,4]

Owens Corning Lumber Profile	Joist Spacing (mm o.c.)	Deflection Limits									
		L/360		L/240		L/180		L/150		L/120	
		Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever	Joist Span[1]	Max.[2] Cantilever
2" x 6"	305	1.5	20.3	1.7	25.4	1.8	33.0	1.9	35.6	2.1	40.6
	405	1.3	22.9	1.5	27.9	1.7	33.0	1.8	38.1	1.9	43.2
	610	1.2	22.9	1.3	30.5	1.5	35.6	1.5	38.1	1.7	40.6
2" x 8"	305	2.0	38.1	2.3	48.3	2.5	58.4	2.7	61.0	2.9	61.0
	405	1.8	40.6	2.1	50.8	2.3	55.9	2.4	58.4	2.6	61.0
	610	1.6	38.1	1.8	43.2	2.0	48.3	2.1	50.8	2.3	55.9
2" x 10"	305	2.4	55.9	2.8	61.0	3.1	61.0	3.3	61.0	3.5	61.0
	405	2.2	53.3	2.5	61.0	2.8	61.0	3.0	61.0	3.2	61.0
	610	1.9	48.3	2.2	53.3	2.4	61.0	2.6	61.0	2.8	61.0
2" x 12"	305	2.9	61.0	3.3	61.0	3.7	61.0	3.9	61.0	4.2	61.0
	405	2.6	61.0	3.0	61.0	3.3	61.0	3.5	61.0	3.8	61.0
	610	2.3	55.9	2.6	61.0	2.9	61.0	3.1	61.0	3.3	61.0

Imperial Units: 1 m = 3.281 ft, 1 mm = 0.0398 in

1. Joist spacing is based on a design live load of 4.79 kPa (100 psf).
2. Maximum cantilever based on twice the joist span deflection limit and a 99.8 kg (220 lb) point load applied to the end. Joist cantilever shall be limited to 0.61 m (2' 0"), a cantilever length that results in twice the deflection limit for the main span, or twenty-five percent (25%) of the length of the joist span, whichever is less.
3. Owens Corning decks use proprietary materials and conditions not prescribed in CSA O86.
4. Joist spacing is based on a temperature factor of 1.0.

5.2.3 In general, the maximum joist cantilever is 0.6 m (2' 0"), a cantilever length that results in twice the deflection limit for the main span, or twenty-five percent (25%) of the length of the joist span, whichever is less.

5.2.4 The length of the cantilever is measured from the exterior side of the post or beam to the end of the rim joist.

5.2.5 Owens Corning Lumber joist deflection limits are based upon empirical testing of Owens Corning Lumber decks. Identical deck configurations were constructed. Owens Corning Lumber deck performance was compared directly to decks constructed of competing materials. These deflection limits are considered proprietary intellectual property and trade secrets.

5.2.6 An example of Owens Corning Lumber joist installation is shown in **Figure 2**.

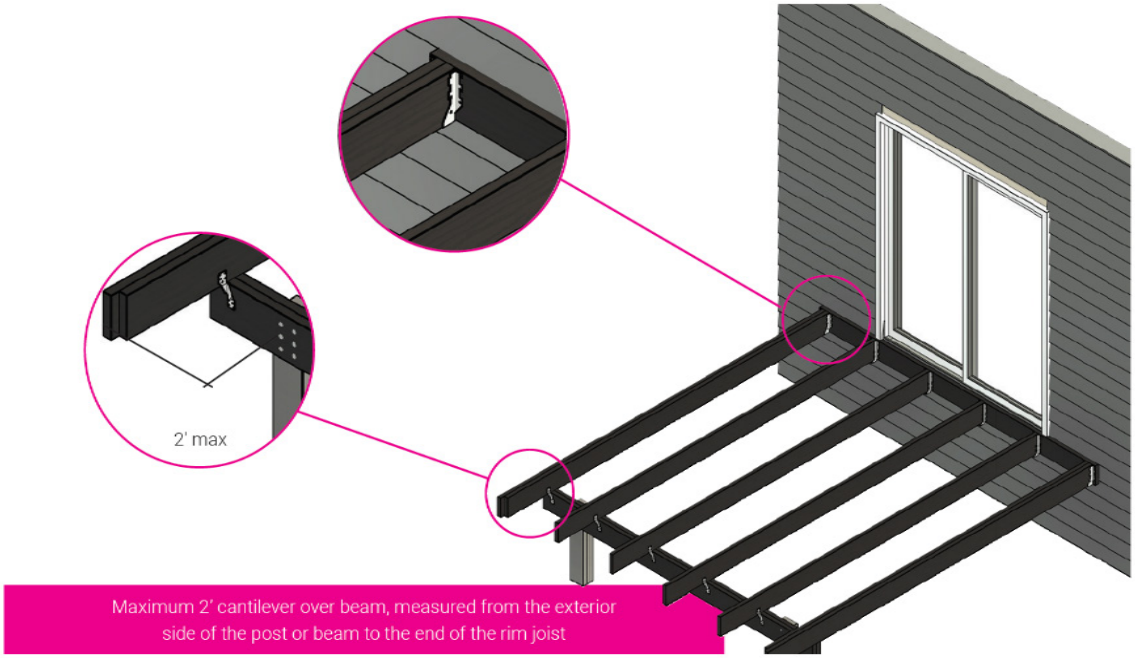


Figure 2. Owens Corning Lumber Joist Installation

5.3 Maximum post spacing recommended for support of deck beams with two supports are depicted in **Figure 3** and **Table 6**.

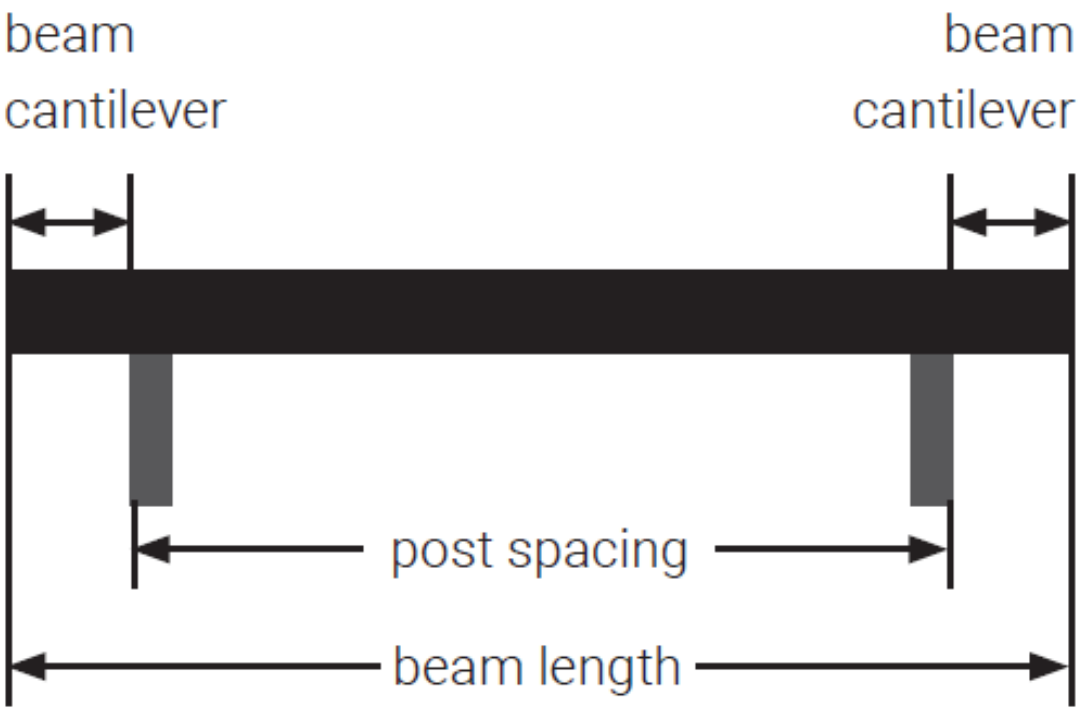


Figure 3. Post Spacing for Support of Beams at Two (2) Locations

Table 6. Maximum Post Spacing (Beam Span) (m) and Cantilever Lengths (cm) for Support of Beams at Two (2) Locations[1,2,3,4,5] – 1.92 kPa LL

Owens Corning Lumber Profile	Number of Plies	Length of OC Joist (m)									
		1.2		1.5		1.8		2.1		2.4	
		Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever
2" x 6"	2	1.8	43.2	1.7	40.6	1.7	40.6	1.6	38.1	1.6	38.1
	3	2.0	50.8	2.0	48.3	1.9	45.7	1.8	45.7	1.8	43.2
2" x 8"	2	2.4	61.0	2.3	58.4	2.3	55.9	2.2	53.3	2.1	50.8
	3	2.8	61.0	2.7	61.0	2.6	61.0	2.5	61.0	2.4	61.0
2" x 10"	2	3.0	61.0	2.9	61.0	2.8	61.0	2.7	61.0	2.6	61.0
	3	3.4	61.0	3.3	61.0	3.2	61.0	3.1	61.0	3.0	61.0
2" x 12"	2	3.6	61.0	3.4	61.0	3.3	61.0	3.2	61.0	3.1	61.0
	3	4.1	61.0	3.9	61.0	3.8	61.0	3.7	61.0	3.6	61.0

Owens Corning Lumber Profile	Number of Plies	Length of OC Joist (m)									
		2.7		3.0		3.4		3.7		4.0	
		Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever
2" x 6"	2	1.5	35.6	1.5	35.6	1.5	35.6	1.4	33.0	1.4	33.0
	3	1.7	43.2	1.7	40.6	1.7	40.6	1.6	40.6	1.6	38.1
2" x 8"	2	2.1	50.8	2.0	48.3	2.0	48.3	1.9	48.3	1.9	45.7
	3	2.4	58.4	2.3	55.9	2.3	55.9	2.2	53.3	2.2	53.3
2" x 10"	2	2.6	61.0	2.5	61.0	2.4	61.0	2.4	58.4	2.3	58.4
	3	2.9	61.0	2.9	61.0	2.8	61.0	2.7	61.0	2.7	61.0
2" x 12"	2	3.0	61.0	3.0	61.0	2.9	61.0	2.8	61.0	2.8	61.0
	3	3.5	61.0	3.4	61.0	3.3	61.0	3.2	61.0	3.2	61.0

Owens Corning Lumber Profile	Number of Plies	Length of OC Joist (m)					
		4.3		4.6		4.9	
		Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever
2" x 6"	2	1.4	33.0	1.3	33.0	1.3	30.5
	3	1.6	38.1	1.5	38.1	1.5	35.6
2" x 8"	2	1.9	45.7	1.8	45.7	1.8	43.2
	3	2.1	50.8	2.1	50.8	2.1	50.8
2" x 10"	2	2.3	55.9	2.3	55.9	2.2	53.3
	3	2.6	61.0	2.6	61.0	2.5	61.0
2" x 12"	2	2.7	61.0	2.7	61.0	2.6	61.0
	3	3.1	61.0	3.1	61.0	3.0	61.0

Table 6. Maximum Post Spacing (Beam Span) (m) and Cantilever Lengths (cm) for Support of Beams at Two (2) Locations[1,2,3,4,5] – 1.92 kPa LL

Imperial Units: 1 m = 3.281 ft, 1 mm = 0.0394 in

1. Post spacing is based on joists with a design live load of 1.92 kPa (40 psf) per NBC Table 4.1.5.3 for residential areas and a deflection limit of L/240 per NBC Table 9.4.3.1.
2. Maximum beam cantilever is based on twice the joist span deflection limit and a 1.92 kPa (40 psf) LL applied on the cantilever. Beam cantilever shall be limited to 0.61 m (2' 0"), a cantilever length that results in twice the deflection limit for the main span, or twenty-five percent (25%) of the length of the joist span, whichever is less.
3. Post spacing is based on a temperature factor of 1.0.
4. Table is applicable tor decks serving single dwelling units only.
5. Owens Corning decks use proprietary materials and conditions not prescribed in CSA O86.

5.3.1 In general, the maximum beam cantilever is 0.61 m (2' 0"), a cantilever length that results in twice the deflection limit for the main span, or twenty-five percent (25%) of the length of the joist span, whichever is less.

5.3.2 The length of the cantilever is measured from the exterior side of the post to the end of the beam length.

5.3.3 The procedure for using **Table 6** is as follows:

5.3.3.1 Determine the length of joist to be used for your deck (i.e., 3.0 m).

5.3.3.2 Find the *"Length of Joist"* column in **Table 6** (in this case, 3.0 m).

5.3.3.3 Using the beam size and number of plies (50mm x 203mm [2" x 8"] beam that is 3-ply), find the maximum Owens Corning post spacing that supports a 3.0 m joist (this is a 2.3 m post spacing – see **red bold** numbers in **Table 6**).

5.3.3.4 If applicable, add cantilever length(s) to determine final beam length (i.e., if the 2.3 m post spacing has a beam with 0.56 m cantilevers on each end [25% of post spacing] the maximum beam length is 3.42 m).

5.4 Maximum post spacing recommended for support of deck beams with three supports are depicted in **Figure 4** and **Table 7**.

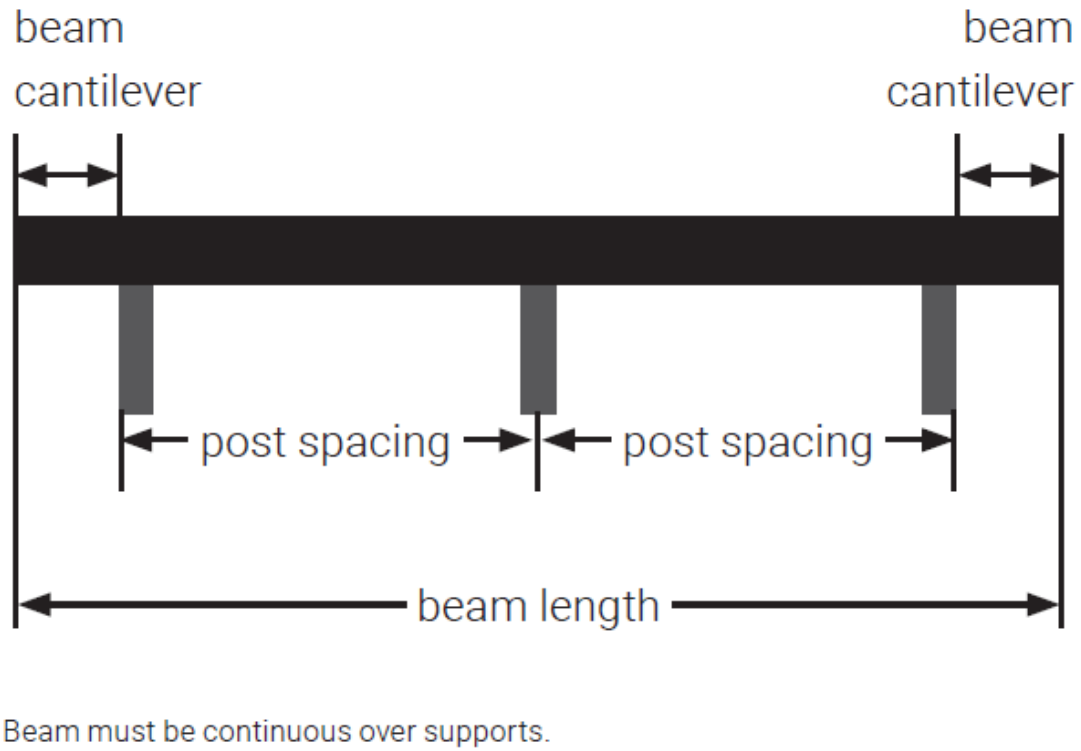


Figure 4. Post Spacing for Support of Beams at Three (3) or More Locations

Table 7. Maximum Post Spacing (Beam Span) (m) and Cantilever Lengths (cm) for Support of Beams at Three (3) Locations[1,2,3,4,5,6] – 1.92 kPa LL

Owens Corning Lumber Profile	Number of Plies	Length of OC Joist (m)									
		1.2		1.5		1.8		2.1		2.4	
		Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever
2" x 6"	2	1.9	43.2	1.8	40.6	1.7	40.6	1.7	38.1	1.6	38.1
	3	2.1	50.8	2.0	48.3	2.0	45.7	1.9	45.7	1.9	43.2
2" x 8"	2	2.5	61.0	2.4	58.4	2.4	55.9	2.3	53.3	2.2	50.8
	3	2.9	61.0	2.8	61.0	2.7	61.0	2.6	61.0	2.5	61.0
2" x 10"	2	3.1	61.0	3.0	61.0	2.9	61.0	2.8	61.0	2.7	61.0
	3	3.6	61.0	3.4	61.0	3.3	61.0	3.2	61.0	3.1	61.0
2" x 12"	2	3.7	61.0	3.6	61.0	3.4	61.0	3.3	61.0	3.2	61.0
	3	4.2	61.0	4.1	61.0	3.9	61.0	3.8	61.0	3.7	61.0

Owens Corning Lumber Profile	Number of Plies	Length of OC Joist (m)[4]									
		2.7		3.0		3.4		3.7		4.0	
		Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever
2" x 6"	2	1.6	35.6	1.5	35.6	1.5	35.6	1.5	33.0	1.4	33.0
	3	1.8	43.2	1.8	40.6	1.7	40.6	1.7	40.6	1.7	38.1
2" x 8"	2	2.2	50.8	2.1	48.3	2.1	48.3	2.0	48.3	2.0	45.7
	3	2.5	58.4	2.4	55.9	2.4	55.9	2.3	53.3	2.3	53.3
2" x 10"	2	2.7	61.0	2.6	61.0	2.5	61.0	2.5	58.4	2.4	58.4
	3	3.0	61.0	3.0	61.0	2.9	61.0	2.8	61.0	2.8	61.0
2" x 12"	2	3.2	61.0	3.1	61.0	3.0	61.0	2.9	61.0	2.9	61.0
	3	3.6	61.0	3.5	61.0	3.4	61.0	3.4	61.0	3.3	61.0

Owens Corning Lumber Profile	Number of Plies	Length of OC Joist (m)[4]					
		4.3		4.6		4.9	
		Beam Span	Max. Cantilever	Beam Span	Max. Cantilever	Beam Span	Max. Cantilever
2" x 6"	2	1.4	33.0	1.4	33.0	1.4	30.5
	3	1.6	38.1	1.6	38.1	1.6	35.6
2" x 8"	2	1.9	45.7	1.9	45.7	1.9	43.2
	3	2.2	50.8	2.2	50.8	2.1	50.8
2" x 10"	2	2.4	55.9	2.3	55.9	2.3	53.3
	3	2.7	61.0	2.7	61.0	2.6	61.0
2" x 12"	2	2.8	61.0	2.8	61.0	2.7	61.0
	3	3.2	61.0	3.2	61.0	3.1	61.0

Table 7. Maximum Post Spacing (Beam Span) (m) and Cantilever Lengths (cm) for Support of Beams at Three (3) Locations[1,2,3,4,5,6] – 1.92 kPa LL

Imperial Units: 1 m = 3.281 ft, 1 mm = 0.0394 in

1. Post spacing is based on joists with a design live load of 1.92 kPa (40 psf) per NBC Table 4.1.5.3 for residential areas and a deflection limit of L/240 per NBC Table 9.4.3.1.
2. The spans shown in this table assume the beams are continuous across all supports.
3. Maximum beam cantilever is based on twice the joist span deflection limit and a 1.92 kPa (40 psf) LL applied on the cantilever. Beam cantilever shall be limited to 0.61 m (2' 0"), a cantilever length that results in twice the deflection limit for the main span, or twenty-five percent (25%) of the length of the joist span, whichever is less.
4. Post spacing is based on a temperature factor of 1.0.
5. Table is applicable tor decks serving single dwelling units only.
6. Owens Corning decks use proprietary materials and conditions not prescribed in CSA O86.

5.4.1 In general, the maximum beam cantilever is 0.61 m (2' 0"), a cantilever length that results in twice the deflection limit for the main span, or twenty-five percent (25%) of the length of the joist span, whichever is less.

5.4.2 The length of the cantilever is measured from the exterior side of the exterior post to the end of the beam length.

5.4.3 Deflection limits used to create post spacing are based upon empirical testing of Owens Corning Lumber decks. Identical deck configurations were constructed. Owens Corning Lumber deck performance was compared directly to decks constructed of competing materials. These deflection limits are considered proprietary intellectual property and trade secrets.

5.4.4 The procedure for using **Table 7** is as follows:

5.4.4.1 Determine the length of joist to be used for your deck (i.e., 3.0 m).

5.4.4.2 Find the *"Length of Joist"* column in **Table 7** (in this case, 3.0 m).

5.4.4.3 Using the beam size and number of plies (50mm x 203mm [2" x 8"] beam that is 3-ply), find the maximum Owens Corning post spacing that supports a 3.0 m joist (this is a 2.4 m post spacing – see **red bold** numbers in previous table).

5.4.4.4 If applicable, add cantilever(s) to determine final beam length (i.e., if the 2.4 m post spacing has a beam with 0.56 m cantilevers on each end, the maximum beam length is 3.52 m).

5.5 The maximum bearing capacity of built-up Owens Corning Lumber posts that are used to support 2-ply and 3-ply Owens Corning Lumber beams are provided in **Figure 5**, **Figure 6**, and **Table 8**.

5.5.1 See **Section 6.3.2** for assembly details of built-up Owens Corning Lumber posts.

5.5.2 The maximum post height is 2.74 m (9' 0").

5.5.3 All posts shall be diagonally braced to prevent side-sway and/or buckling.

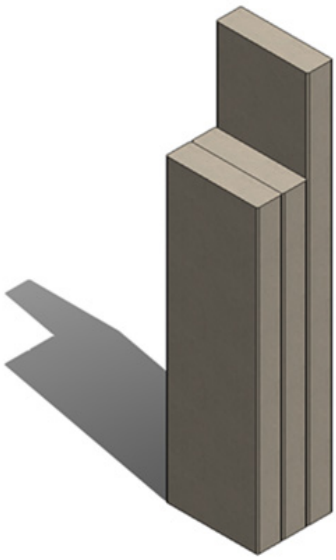


Figure 5. Owens Corning Lumber Post Supporting a 2-Ply Beam

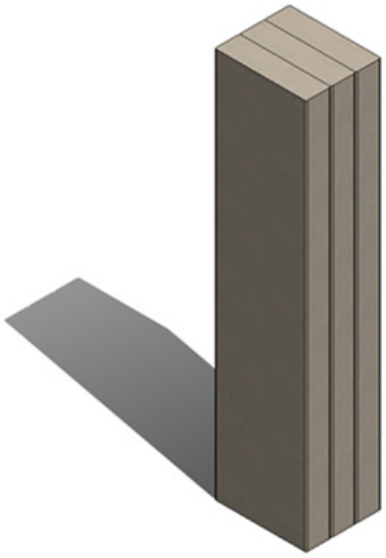


Figure 6. Owens Corning Lumber Post Supporting a 3-Ply Beam

Table 8. Maximum Bearing Capacity of Posts (kN) to Support 2-Ply and 3-Ply Beams[1]

Maximum Factored Bearing Capacity Support a 2-Ply Beam (See Figure 5)	Maximum Factored Bearing Capacity to Support a 3-Ply Beam (See Figure 6)
42.7	67.6

Imperial Units: 1 N = 0.225 lb

1. Maximum post height is 2.74 m (9 ft).
2. ***Important Note***: All posts shall be diagonally braced to prevent side-sway and buckling.

5.6 General application information regarding fasteners to be used with Owens Corning Lumber are as follows:

5.6.1 *Dowel-Type Fasteners:*

5.6.1.1 Starborn® CAP-TOR® XD 305 Stainless Steel Composite/PVC Screw, #10 x2 3/4"

5.6.1.2 CAMO® Premium 316 Stainless Steel Deck Screw, #10 x 2 1/2"

5.6.1.3 Simpson Strong-Drive® SD Connector SS Screw, #9 x 2 1/2"

5.6.1.4 Simpson Strong-Drive® SD Connector SS Screw, #9 x 1 1/2"

5.7 *Fastener Connection Performance*

5.7.1 Head-pull through and withdrawal resistance when installed in Owens Corning Lumber were evaluated, and the allowable connection design values for the specified fasteners are shown in **Table 9** and **Table 10**.

Table 9. Reference Factored Head-Pull-Through Design Values (N)

Owens Corning Lumber Profile	CAMO Premium 316 Stainless Steel Deck Screw, #10 x2 1/2"	Starborn CAP-TOR xd 305 Stainless Steel Composite/PVC Screw, #10 x2 3/4"
1/2" x 6" or 1/2" x 10"	1,115	535
5/4" x 6" or 5/4" x 8"	1,170	1,335
Scant 2" x 6"	1,645	1,645
Imperial Units: 1 N = 0.225 lb, 1 mm = 0.0394 in		

Table 10. Reference Factored Withdrawal Design Values (N)[1]

Fastener	End Grain Installation	Narrow Edge/Wide Face Installation
CAMO Premium 316 Stainless Steel Deck Screw, #10 x2 1/2"	2,000	2,070
Starborn CAP-TOR xd 305 Stainless Steel Composite/PVC Screw, #10 x2 3/4"	2,600	2,735
Imperial Units: 1 N = 0.225 lb, 1 mm = 0.0394 in 1. Minimum penetration into Owens Corning Lumber profiles shall be 38 mm (1 1/2".)		

5.7.2 *Metal Connectors:*

5.7.2.1 Beam-to-post connectors with a minimum uplift capacity of 8.90 kN (2,000 lbs).

5.7.2.2 Hurricane ties and angle brackets with minimum uplift capacity of 2.22 kN (500 lbs).

5.8 General application information regarding WEARDECK decking follows:

5.8.1 *Minimum Screw Lengths:*

5.8.1.1 63 mm (2 1/2") screws for 5/4" x 8" WEARDECK

5.8.1.2 38 mm (1 1/2") screws for 1/2" x 6" and 1/2" x 10" WEARDECK

5.8.2 Nails connecting WEARDECK to the supporting members must be at least 63 mm (2 1/2") long in accordance with CSA O86 Section 6.5.10.2.1.

5.8.3 *Minimum Spacing:*

5.8.3.1 End to end: 2 mm (1/16"); 5 mm (3/16" recommended)

5.8.3.2 Side to side: 2 mm (1/16"); 5 mm (3/16" recommended)

5.9 As an alternative to sawn lumber, flexural design properties of Owens Corning Lumber is determined in accordance with the provisions for proprietary structural products in CSA O86 Section 16.3.

5.9.1 Unless otherwise noted, adjustment of the design stresses for duration of load shall be in accordance with the applicable code.

5.9.2 The design provisions for wood construction in compliance with the NBC using LSD shall be in accordance with CSA O86.

5.9.3 LSD properties in dry and ambient conditions for various Owens Corning Lumber member sizes are provided in **Table 11**.

Table 11. Owens Corning Structural Lumber Edgewise Orientation Limit States Factored Design Values

Owens Corning Lumber Profile	F_b (MPa)	EI (kN·mm²)	MOE (MPa)	I_x (cm⁴)	S_x (cm³)
2 x 6	14	20,900,000	2,413	866	12.5
2 x 8	15	52,900,000	2,413	2,194	23.1
2 x 10	16	99,400,000	2,413	4,117	35.1
2 x 12	14	166,000,000	2,241	7,409	51.8
Imperial Units: 1 MPa = 145.038 psi, 1 kN-mm² = 0.348 lb-in², 1 cm⁴ = 0.24 in⁴, 1 cm³ = 0.061 in³					

5.9.4 The effects of temperature and freeze-thaw cycles on Owens Corning Lumber were evaluated.

5.9.4.1 For design considerations, reductions in bending strength and stiffness shall be considered when Owens Corning Lumber products will experience sustained exposure to elevated temperatures.

5.9.4.2 Temperature factors are presented in **Table 12**.

Table 12. Temperature Factors

Property	T ≤ 23° C	23° C ≤ T ≤ 30° C	30° C ≤ T ≤ 37° C	37° C ≤ T ≤ 45° C	45° C ≤ T ≤ 52° C
f_b	1.00	0.90	0.81	0.71	0.62
MOE	1.00	0.95	0.90	0.85	0.81

5.9.5 Applications of Owens Corning Lumber that require professional engineering are those conditions where the joist, beam, and column application is outside of the prescriptive design properties provided in **Table 2** through **Table 8**.

5.9.5.1 A deck design that requires higher applied loads, longer spans, multiple joist spans, a cantilever, a concentrated load, multiple applied loads, and so forth, will require an engineered design.

5.9.6 The engineered design drawing development process includes, but is not be limited to, the following guidelines:

5.9.6.1 To size Owens Corning Lumber structural members, use the allowable stress design values found in **Table 1**.

5.9.6.2 Analyze the resistance needed for the pertinent member size designated in **Table 11** using the allowable stress design properties and standard engineering equations.[6]

5.9.6.2.1 These design properties are based upon test data and use actual design dimensions, (i.e., 38 mm x 140mm [1 1/2" by 5 1/2"] for 2 x 6 section properties).

5.9.6.3 Create an engineered design drawing for the application which includes, but is not limited to, span, depth, applied loads, support conditions, anchorage, reaction limits, component connections, deflection limits, moisture conditions, serviceability conditions, durability conditions, end connection details, boundary condition application details, and so forth.

5.9.6.4 Each Owens Corning Lumber engineered design and associated engineered design drawing shall provide sufficient detailing for the specific floor, wall, or roof installation.

5.9.6.5 Each Owens Corning Lumber structural member design is defined as an engineered design pursuant to the building code and professional engineering law, which requires the design to be performed by an RDP, where all loading and boundary conditions are provided by the owner or the Registered Design Professional in Responsible Charge of the project.

5.9.6.5.1 Where assistance is needed regarding Owens Corning Lumber specialty engineered designs, please contact Owens Corning technical support.

5.9.7 To establish a complete load path, all connections shall be designed separately to transfer load from Owens Corning Lumber to other structural members and then onto the foundation.

5.10 *Owens Corning Standard Deck Tested and Analyzed – Load Resistance for a Specific OC Deck Design*

5.10.1 Owens Corning Lumber decks were constructed as detailed in **Figure 7**.

5.10.2 3.66 m x 3.05 m (12' x 10') decks were constructed with joists spaced at 610 mm (24") on center, 406 mm (16") on center, and at 305 mm (12") on center.

5.10.3 These decks were constructed with a 610 mm (24") cantilever on one side of the deck and the joists were installed using 2 x 8 Owens Corning Lumber.

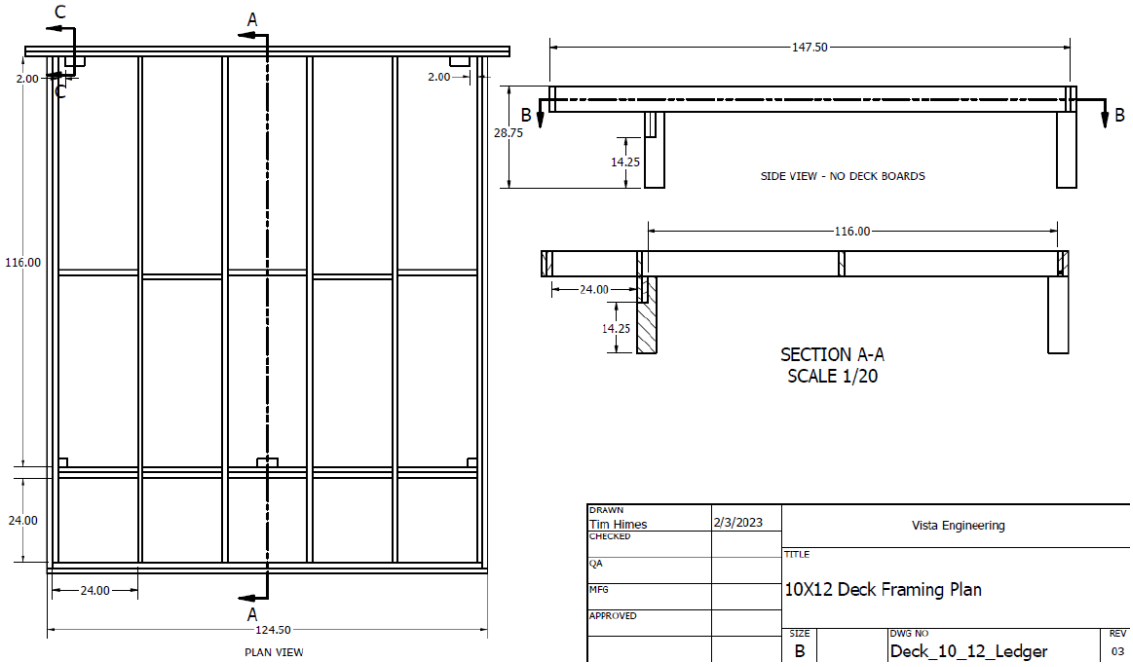


Figure 7. Tested Deck Framing Plan

5.10.4 Based upon this Owens Corning deck standard design for the specific **Figure 7** installation details, the allowable design values for Owens Corning Lumber Composite Assemblies are found in **Table 13**.

Table 13. Composite Floor Joist Assembly Applications[1]

Product	3.66 m (12ft) Long Owens Corning Lumber Joist with 0.61 m (2-foot) Cantilever Live Load, (kPa)		
	Joist Spaced 610 mm (24" o.c.)	Joist Spaced 406 mm (16" o.c.)	Joist Spaced 305 mm (12" o.c.)
Owens Corning Lumber 2 x 8 Joist Assemblies	1.8	2.4	3.0

SI: 1 in = 25.4 mm, 1 ft = 0.305 m, 1 psf = 0.0479 kPa

1. Factored loads applicable to decks serving a single dwelling unit only.

5.11 *Fire Performance*

5.11.1 Owens Corning Lumber was evaluated for surface burning characteristics (flame spread) in accordance with ASTM E84.

5.11.2 The flame spread index is presented in **Table 14**.

Table 14. Surface Burning Characteristics[1]

Product Description	Flame Spread Index (FSI)
Owens Corning Lumber Joists	≤75
Owens Corning Lumber Deck Boards	

1. Tested in accordance with ASTM E84 and meets Class B requirements for Flame Spread.

5.12 *Owens Corning Lumber Stair Tread Application*

5.12.1 Owens Corning Lumber was evaluated for its performance for use as stair treads in accordance with NBC Section 9.8.

5.12.1.1 Owens Corning Lumber may be used as stair treads for exterior decks serving single dwelling units.

5.12.2 Stair tread dimensions shall follow the requirements of NBC Subsection 9.8.4.

5.12.3 Minimum of a three span configuration shall be installed when Owens Corning Lumber is used for stair tread applications.

5.13 *Owens Corning Lumber Stair Stringer Application*

5.13.1 Owens Corning Lumber was evaluated for its performance as stair stringers.

5.13.1.1 Owens Corning Lumber may be used as stair stringers for exterior decks serving single dwelling units.

5.13.1.2 Minimum of a three span configuration shall be installed when Owens Corning Lumber is used for stair stringer applications.

5.13.1.3 Stringers shall be reinforced with blocking.

5.13.2 **Table 15** demonstrates maximum stair stringer spans per loading condition and stringer spacing.

Table 15. Maximum Allowable Stair Stringer Spans (m) Per Loading Criteria[2,3,4]

Live Load (kPa)	Stringer Spacing, mm (in) o.c.	Total Load[1] (Dead Load + Live Load)		Live Load Only	
		L/180	L/240	L/360	L/480
1.99	203 (8)	2.6	2.4	2.3	2.0
	254 (10)	2.4	2.2	2.1	1.9
	305 (12)	2.3	2.1	2.0	1.8
	356 (14)	2.2	2.0	1.9	1.7
2.49	203 (8)	2.5	2.2	2.1	1.9
	254 (10)	2.3	2.1	1.9	1.8
	305 (12)	2.1	1.9	1.8	1.7
	356 (14)	2.0	1.9	1.7	1.6
2.98	203 (8)	2.3	2.1	2.0	1.8
	254 (10)	2.2	2.0	1.8	1.7
	305 (12)	2.0	1.9	1.7	1.6
	356 (14)	1.9	1.8	1.6	1.5
3.48	203 (8)	2.2	2.0	1.9	1.7
	254 (10)	2.1	1.9	1.7	1.6
	305 (12)	2.0	1.8	1.6	1.5
	356 (14)	1.9	1.7	1.6	1.4
3.98	203 (8)	2.2	2.0	1.8	1.6
	254 (10)	2.0	1.8	1.7	1.5
	305 (12)	1.9	1.7	1.6	1.4
	356 (14)	1.8	1.6	1.5	1.4

Imperial Units: 1 m = 3.281 ft, 1 mm = 0.0394 in

1. Total load includes a 0.575 kPa (12 psf) dead load
2. Minimum throat depth of 127mm (5").
3. Minimum of three stringer stair assemblies tied together with stair treads.
4. These span calculations do not account for creep or external factors such as temperature, freeze-thaw cycles, UV exposure, etc.

5.14 Railings and rail posts are outside of the scope of this report. For more information, please contact Owens Corning technical support.

5.15 For more information, see the manufacturer installation guide or contact Owens Corning technical support.

5.16 Where the application falls outside of the performance evaluation, conditions of use and/or installation requirements set forth herein, alternative techniques shall be permitted in accordance with accepted engineering practice and experience. This includes but is not limited to the following areas of engineering: mechanics or materials, structural, building science and fire science.

6 Installation

6.1 Installation shall comply with the manufacturer installation instructions, this report, the approved construction documents, and the applicable building code.

6.2 In the event of a conflict between the manufacturer installation instructions this report and the applicable building code, the more restrictive shall govern.

6.3 *Exterior Deck Installation Procedure*

6.3.1 Install a ledger board to the desired structure in accordance with either NBC Article 9.23.9.2.

6.3.1.1 For fasteners not specified in building codes, fastener spacing provisions from other approved sources may be permitted for the installation of the ledger board.

6.3.1.2 Ledger board shall be greater than or equal to the joist size.

6.3.2 Assemble 3-ply posts using 2 x 6 Owens Corning Lumber and #10 x 4" screws as shown in **Figure 8** (notched post for a 2-ply beam) and **Figure 9** (for a 3-ply beam).

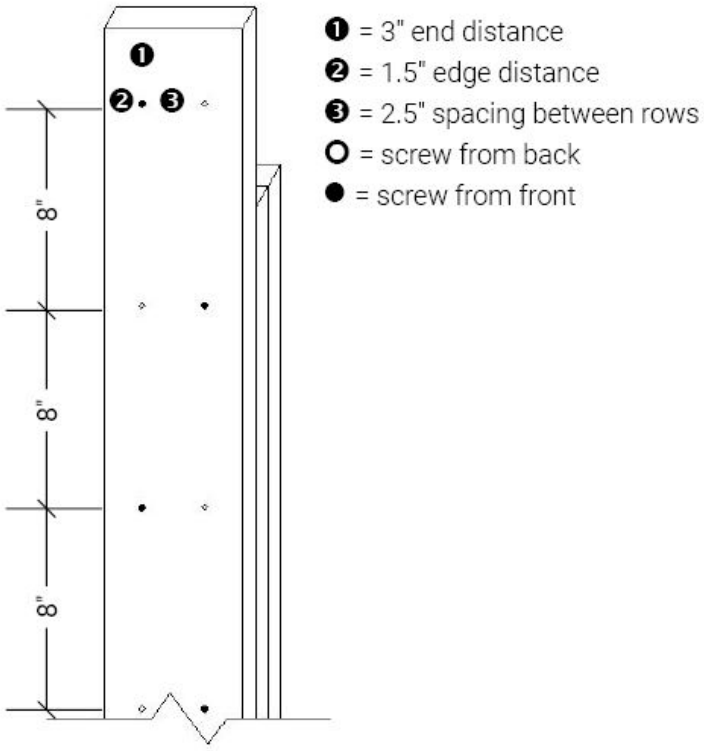


Figure 8. Post Supporting a 2-Ply Beam

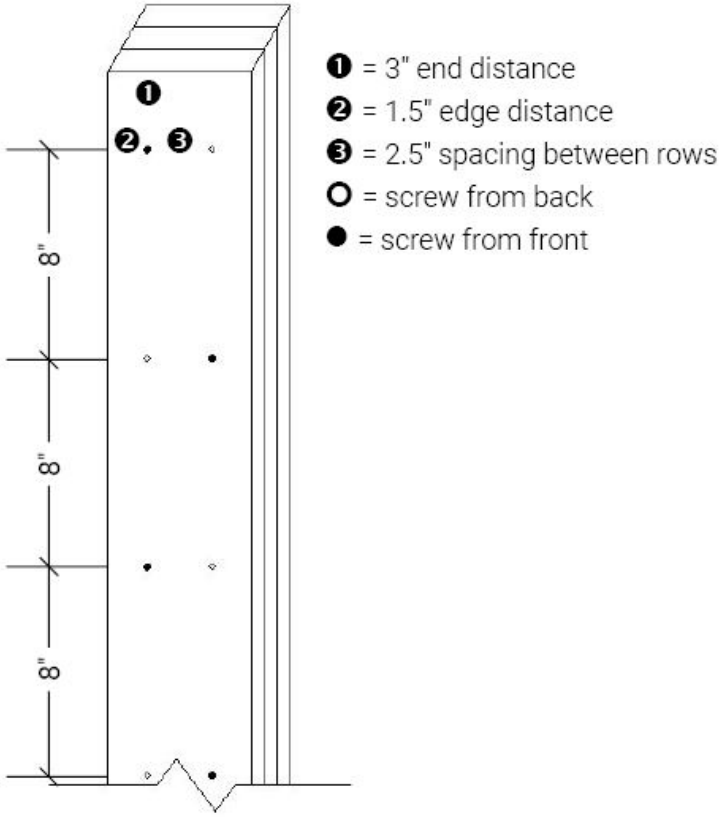


Figure 9. Post Supporting a 3-Ply Beam

6.3.2.1 Screws securing the Owens Corning Lumber plies for use as posts shall be staggered and placed 203 mm (8") o.c.

6.3.2.2 A 2-ply beam shall be fastened to each notched 3-ply Owens Corning Lumber post with two rows of #10 x 3" screws. Minimum edge distance shall be 38 mm ($1^1/_2$").

6.3.2.2.1 2 x 6 beams require two (2) screws per row at each notched post.

6.3.2.2.2 2 x 8 beams require three (3) screws per row at each notched post.

6.3.2.2.3 2 x 10 beams require four (4) screws per row at each notched post.

6.3.2.3 A 3-ply beam shall be secured to the 3-ply Owens Corning Lumber post with a code-compliant post cap connector with a minimum uplift capacity of 905 kg (2,000 lb).

6.3.2.4 Posts shall be anchored to footings in compliance with the applicable building codes.

6.4 Assemble 2-ply or 3-ply Beams 2x Owens Corning Lumber:

6.4.1 Beams shall be secured using #10 x 3" screws staggered in two rows as shown in **Figure 10**.

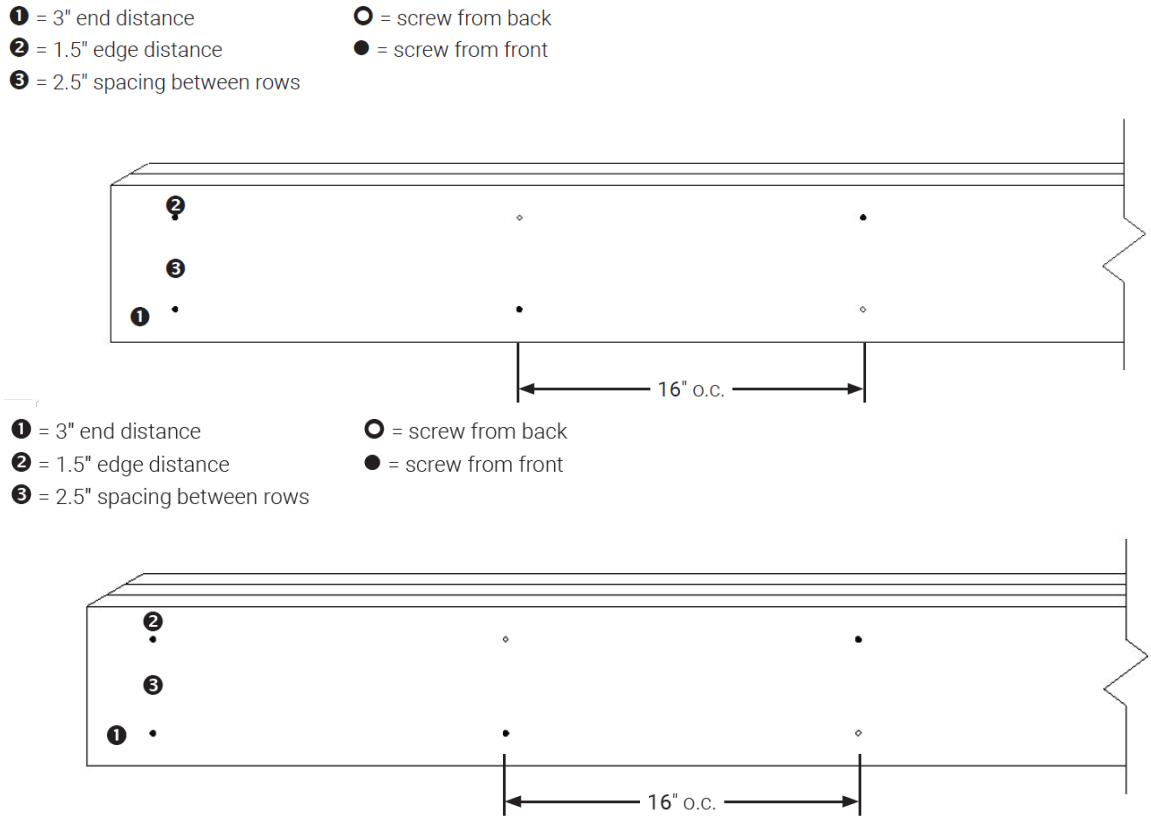


Figure 10. Owens Corning Lumber Beams – 2-Ply (Top) and 3-Ply (Bottom)

6.4.2 Owens Corning Lumber beams shall be installed onto Owens Corning Lumber posts in accordance with **Section 6.3.2**.

6.4.2.1 Overhangs up to 0.61 m (2') over the sides of the joists may be permitted.

6.4.2.2 Overhangs are limited to the lesser of 0.61 m (2') or twenty-five percent (25%) of the length of the beam span between posts.

6.4.3 A 2-ply Owens Corning Lumber beam shall be used as the band joist and assembled as shown in **Figure 10**. However, spacing of rows of fasteners shall be 305 mm (12") o.c. instead of 406 mm (16") o.c. as shown in **Figure 10**.

6.4.3.1 The outer ply shall overhang the inner ply by 38 mm (1 1/2") at the free end of the band joist.

6.4.3.1.1 For ease, length of inner ply of the band joist and deck joists are equivalent.

6.4.3.1.2 Joist hangers shall be sized appropriately and in accordance with **Table 16** of this report.

Table 16. Minimum Design Values for Hangers Attached to Owens Corning Lumber[1]

Hanger Type	Minimum Gravity Allowable Load (N)	Minimum Uplift Allowable Load (N)
Single 2 x 6 Joist Hanger	2,000	2,000
Single 2 x 8 Joist Hanger	2,000	2,000
Single 2 x 10 Joist Hanger	2,000	2,000
Double 2 x 6 Joist Hanger	3,000	2,000
Double 2 x 8 Joist Hanger	4,000	2,000
Double 2 x 10 Joist Hanger	5,000	2,000

Imperial Units: 1 N = 0.225 lb

1. Tested in accordance with ASTM D7147.

6.4.3.2 Hurricane ties shall be used to secure deck joists to deck beams for dropped beam installation.

6.4.4 Install blocking between each joist every 4' to 5' using #10 x 3" composite deck screws.

6.4.4.1 Blocking shall be staggered.

6.4.4.2 Installation of blocking over the drop beam is recommended.

6.4.4.3 Screws shall be installed along the centerline of each blocking with a minimum edge distance of 38 mm (1 1/2").

6.4.5 Install first rim joist, a single ply Owens Corning Lumber beam, using #10 x 3" composite deck screws through the side of the rim joist into each deck joist.

6.4.5.1 2 x 6 beams require two (2) screws along the centerline of each blocking with a minimum edge distance of 38 mm (1 1/2").

6.4.5.2 2 x 8 beams require three (3) screws along the centerline of each blocking with a minimum edge distance of 38 mm (1 1/2").

6.4.5.3 2 x 10 beams require four (4) screws along the centerline of each blocking with a minimum edge distance of 38 mm (1 1/2").

6.4.6 Install the second rim joist in front of the first rim joist using two rows of #10 x 3" screws staggered 12" o.c. with a minimum edge distance of 38 mm (1 1/2").

6.4.6.1 Secure the corners of the second rim joist to the outer ply of the band joist using the applicable provisions as in the subsections of **Section 6.4.5**.

6.5 *Stair Stringer Application*

6.5.1 When Owens Corning Lumber is used as stair stringers, fabrication of the stringers shall comply with NBC Article 9.8.9.4.

6.5.2 Choose an appropriate size Owens Corning Lumber that will satisfy a minimum throat depth of 127 mm (5") for project-specific stair riser and tread depth parameters.

7 Substantiating Data

7.1 Testing has been performed under the supervision of a professional engineer and/or under the requirements of ISO/IEC 17025 as follows:

7.1.1 Flexural testing in accordance with ASTM D198

7.1.2 Flexural test data in accordance with ASTM D6109 from approved sources

7.1.3 Vista Engineering Full Deck Assembly Report

7.1.4 Compression testing (short and long specimens) in accordance with ASTM D198

7.1.5 Fastener head-pull through and withdrawal data in accordance with ASTM D1037 from approved sources

7.1.6 Joist hanger assembly testing in accordance with ASTM D7147

7.1.7 Span and post spacing calculations from approved sources

7.1.8 Surface burning characteristics in accordance with ASTM E84

7.2 Information contained herein is the result of testing and/or data analysis by sources that conform to the evaluation requirements of NBC Volume 1 Relationship of the NBC to Standards Development and Conformity Assessment and/or professional engineering regulations. DrJ relies upon accurate data to perform its ISO/IEC 17065 evaluations.

7.3 Where appropriate, DrJ's analysis is based on provisions that have been codified into law through provincial, territorial, or local adoption of codes and standards. The developers of these codes and standards are responsible for the reliability of published content. DrJ analysis may use code-adopted provisions as a control sample. A control sample versus a test sample establishes a product as being equivalent to that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.

7.4 The accuracy of the provisions provided herein may be reliant upon the published properties of raw materials, which are defined by the grade mark, grade stamp, mill certificate, Listings, certified reports, duly authenticated reports from approved agencies, and research reports prepared by approved agencies and/or approved sources provided by the suppliers of products, materials, designs, assemblies and/or methods of construction. These are presumed to be minimum properties and relied upon to be accurate. The reliability of DrJ's engineering practice, as contained in this report, may be dependent upon published design properties by others.

7.5 Testing and engineering analysis: The strength, rigidity and/or general performance of component parts and/or the integrated structure are determined by suitable tests that simulate the actual conditions of application that occur and/or by accepted engineering practice and experience.

7.6 Where additional condition of use and/or code compliance information is required, please search for Owens Corning Lumber on the DrJ Certification website.

8 Findings

8.1 As delineated in **Section 3**, Owens Corning Lumber has performance characteristics that were tested and/or meet pertinent standards and is suitable for use pursuant to its specified purpose.

8.2 When used and installed in accordance with this report and the manufacturer installation instructions, Owens Corning Lumber shall be approved for the following applications:

8.2.1 Joists as permitted in **Table 2** through **Table 5**.

8.2.2 Posts as permitted in **Table 6** and **Table 7**.

8.2.3 Built-up Posts as permitted in **Table 8**.

8.2.4 Ledgers as permitted in **Table 11**.

8.2.5 Headers and beams as permitted in **Table 11**.

8.2.6 Temperature adjustment factors as provided in **Table 12**.

8.2.7 Surface Burning Characteristics per flame spread index shown in **Table 14**.

8.2.8 Stair stringers as permitted in **Table 15**.

8.2.9 Evaluated fastener properties used with Owens Corning Lumber are provided in **Table 9** and **Table 10**.

8.3 Any application specific issues not addressed herein can be engineered by an RDP. Assistance with engineering is available from Owens Corning.

8.4 This innovative product has been evaluated in the context of the codes listed in **Section 2** and is compliant with all known provincial, territorial, and local building codes. Where there are known variations in provincial, territorial, or local codes applicable to this report, they are listed here.

8.4.1 No known variations

8.5 NBC Volume 1 Relationship of the NBC to Standards Development and Conformity Assessment:

> **Certification**
> Certification is the confirmation by an independent organization that a product, service, or system meets a requirement…Certification bodies publish lists of certified products and companies…Several organizations, including the Canadian Construction Materials Centre (CCMC), offer such evaluation services.
>
> **Evaluation**
> An evaluation is a written opinion by an independent professional organization that a product will perform its intended function. An evaluation is very often done to determine the ability of an innovative product, for which no standards exist, to satisfy the intent of the Code requirement...

8.6 ISO/IEC 17065 accredited third-party certification bodies,[7] including but not limited to, Standards Council of Canada (SCC)[8] and ANSI National Accreditation Board (ANAB),[9] confirm that product certification bodies have the expertise to provide technical evaluation services within their scope of accreditation. All SCC and ANAB product certification bodies meet NBC requirements to offer evaluation services for alternative solutions.[10]

8.6.1 DrJ is an ISO/IEC 17065 ANAB-Accredited Product Certification Body – Accreditation #1131[11] and employs professional engineers.[12]

8.7 Through ANAB accreditation and the IAF Multilateral Agreements, this report can be used to obtain innovative product approval in any jurisdiction or country that has IAF MLA Members & Signatories to meet the Purpose of the MLA – "*certified once, accepted everywhere*." IAF specifically says, "*Once an accreditation body is a signatory of the IAF MLA, it is required to recognise certificates and validation and verification statements issued by conformity assessment bodies accredited by all other signatories of the IAF MLA, with the appropriate scope*."[13]

8.8 Product certification organizations, accredited by the SCC and ANAB, are defined as equivalent evaluation services:

8.8.1 Canada-United States-Mexico Agreement (CUSMA), Article 11.6 Conformity Assessment confirms mutual recognition by stating, "*...each Party shall accord to conformity assessment bodies located in the territory of another Party treatment no less favorable than that it accords to conformity assessment bodies located in its own territory or in the territory of the other Party*."

8.8.2 The SCC National Conformity Assessment Principles states, "*SCC is a member of a number of international organizations developing voluntary conformity assessment agreements that help ensure the international acceptance of Canadian conformity assessment results. Signatories to these agreements (like SCC) recognize each other's accreditations as being equivalent to their own*."[14]

8.9 Building official approval of a licensed professional engineer is performed by verifying the professional engineer and/or their business entity are listed by the engineering regulators of the relevant jurisdiction.

9 Conditions of Use

9.1 Material properties shall not fall outside the boundaries defined in **Section 3**.

9.2 As defined in **Section 3**, where material and/or engineering mechanics properties are created for load resisting design purposes, the resistance to the applied load shall not exceed the ability of the defined properties to resist those loads using the principles of accepted engineering practice.

9.3 As listed herein, Owens Corning Lumber shall be used:

9.3.1 As balconies, decks, and other accessible exterior platforms intended for Group C occupancy (residential).

9.3.2 For all other applications, assistance is available from Owens Corning technical support.

9.4 When used as stair stringers, Owens Corning Lumber shall only be used in buildings that serves a single dwelling unit in accordance with Article 9.8.9.1 of the NBC.

9.5 Where required by regulation and enforced by the building official, also known as the authority having jurisdiction (AHJ) in which the project is to be constructed:

9.5.1 Any calculations incorporated into the construction documents shall conform to accepted engineering practice, and, when prepared by an approved source, shall be approved when signed and sealed.

9.5.2 This report and the installation instructions shall be submitted at the time of permit application.

9.5.3 This innovative product has an internal quality control program and a third-party quality assurance program.

9.5.4 At a minimum, this innovative product shall be installed per **Section 6** of this report.

9.5.5 This report shall be reviewed for code compliance by the AHJ in concert with the duties and powers granted to the building official by the provincial regulations governing such duties and powers.

9.5.6 The application of this innovative product in the context of this report is dependent on the accuracy of the construction documents, implementation of installation instructions, inspections, and any other regulatory requirements that may apply.

9.6 Design loads shall be determined in accordance with the building code adopted by the jurisdiction in which the project is to be constructed and/or by the designer (i.e., owner).

9.7 The actual design, suitability, and use of this report, for any particular building, is the responsibility of the owner or the authorized agent of the owner.

10 Identification

10.1 The innovative product listed in **Section 1.1** is identified by a label on the board or packaging material bearing the manufacturer name, product name, report number, and other information to confirm code compliance.

10.2 Additional technical information can be found at www.owenscorning.com.

11 Review Schedule

11.1 This report is subject to periodic review and revision. For the most recent version, visit drjcertification.org.

11.2 For information on the status of this report, contact DrJ Certification.

12 Legislation that Authorizes New Product Approval in International Markets is Found in Appendix A

12.1 Owens Corning Lumber has been tested by an ISO/IEC 17025 accredited laboratory and/or evaluated to be in conformance with accepted engineering practice to ensure durable, livable and safe construction.

12.2 This report is published by an ISO/IEC 17065 accredited certification body with the expertise to evaluate products, materials, designs, services, assemblies and/or methods of construction.

12.3 This report meets the legislative intent and definition of a duly authenticated report, which shall be accepted by the AHJ, unless there are specific reasons why the alternative shall not be approved as provided for in writing.

Appendix A

1 Legislation that Authorizes New Product Approval in Canada

1.1 The Competition Act is a Canadian federal law governing competition law in Canada. The Act contains both criminal and civil provisions aimed at preventing anti-competitive practices in the marketplace. The Act is enforced and administered by the Competition Bureau, whose regulations encourage the approval of NBC referenced and alternative products, materials, designs, services, assemblies and/or methods of construction that:

1.1.1 Advance Innovation,

1.1.2 Promote competition so all businesses have the opportunity to compete on price and quality in an open market on a level playing field unhampered by anticompetitive constraints, and

1.1.3 Benefit consumers through lower prices, better quality, and greater choice.

1.2 **Approved by International Jurisdictions**: The USMCA and GATT agreements provide for approval of innovative materials, products, designs, services, assemblies and/or methods of construction through the Technical Barriers to Trade (TBT) agreements and the International Accreditation Forum (IAF) Multilateral Recognition Arrangement (MLA), where these agreements proclaim the desire of both countries to have their markets open to innovation.

1.3 These agreements:

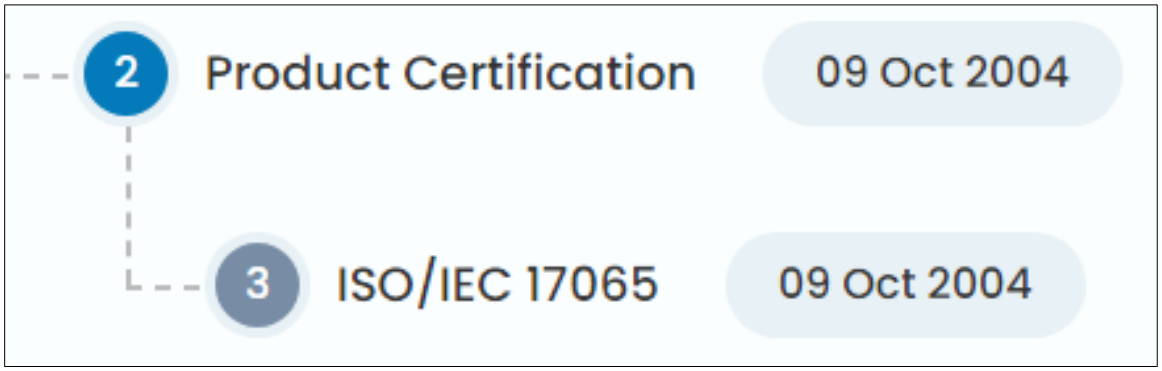
1.3.1 Permit participation of conformity assessment bodies located in the territories of other Members (defined as GATT Countries) under conditions no less favourable than those accorded to bodies located within their territory or the territory of any other country,

1.3.2 State that conformity assessment procedures (i.e., ISO/IEC 17020, 17025, 17065, etc.) are prepared, adopted, and applied so as to grant access for suppliers of like products originating in the territories of other Members under conditions no less favourable than those accorded to suppliers of like products of national origin or originating in any other country, in a comparable situation.

1.3.3 State that conformity assessment procedures are not prepared, adopted, or applied with a view to or with the effect of creating unnecessary obstacles to international trade. This means that conformity assessment procedures shall not be more strict or be applied more strictly than is necessary to give the importing Member adequate confidence that products conform to the applicable technical regulations or standards.

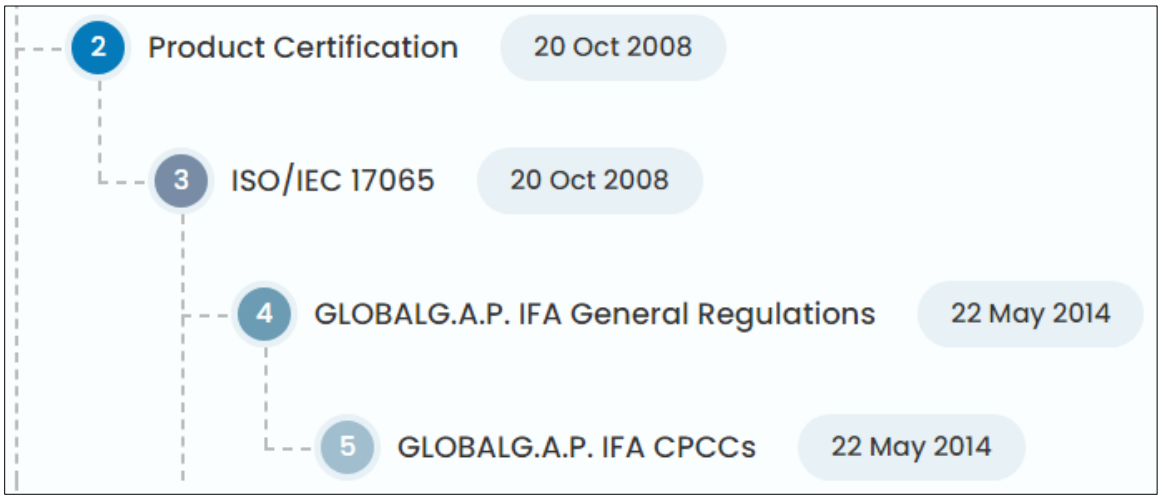
1.4 To this end, Canada operates an accreditation system as follows:

1.5 This includes ISO/IEC 17065 product certification as follows:

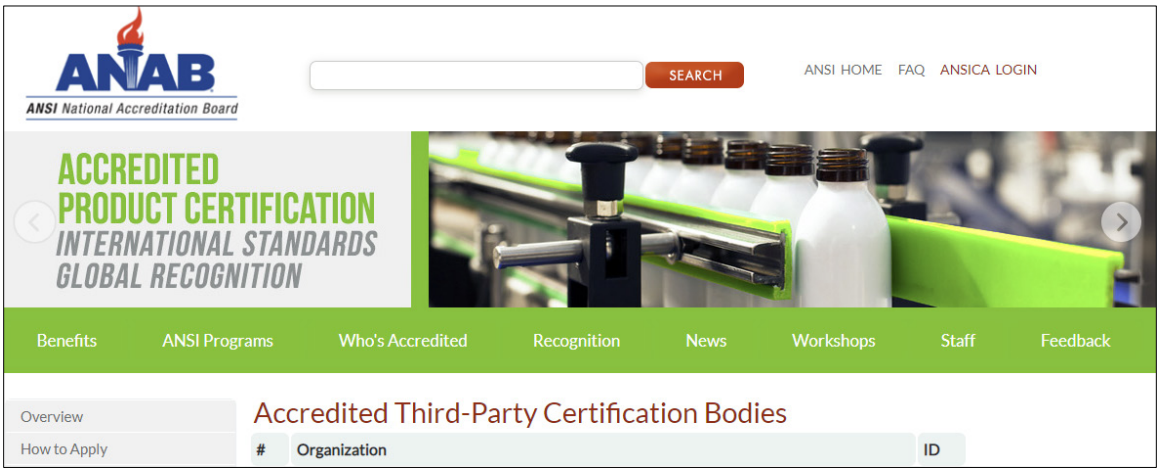


1.6 Similarly, the United States operates multiple accreditation processes with ANAB being the most prominent ISO/IEC 17065 product certification organization as follows:

1.7 This includes ISO/IEC 17065 product certification as follows:



1.8 The list of ANAB accredited ISO/IEC 17065 product certification organizations can be found at the following link: https://anabpd.ansi.org/Accreditation/product-certification/DirectoryListingAccredited?menuID=1&prgID=1



1.9 Approval is granted via International Agreement, where the purpose of the IAF MLA is to ensure mutual recognition of accredited certification and validation/verification statements between signatories. Subsequent acceptance of accredited certification and validation/verification statements is required so that one accreditation can be used for the timely approval of innovative materials, products, designs, services, assemblies and/or methods of construction. Accreditations granted by IAF MLA signatories are recognised worldwide based on their equivalent accreditation programs, therefore reducing costs and adding value to businesses and consumers.

1.10 Consequently, and as one example, these agreements permit product approval of innovative Australian and New Zealand products into US markets and vice-versa.

1.11 Finally, questions that often arises are, *"Why do these agreements exist?"* and *"Why is the ISO/IEC 17065 accredited third-party certification process so important?"*

1.11.1 The answer is that all countries desire to protect the intellectual property and trade secrets of their country's businesses.

1.11.2 In the US this protection is provided by 18 U.S. Code § 1831 Under Economic Espionage, where it states *"whoever, intending or knowing that the offense will benefit any foreign government, foreign instrumentality, or foreign agent, knowingly steals, or without authorization appropriates, takes, carries away, or conceals, or by fraud, artifice, or deception obtains a trade secret shall be fined not more than $5,000,000 or imprisoned not more than 15 years, or both."*

1.11.3 Any organization that commits any offense described shall be fined not more than the greater of $10,000,000 or three (3) times the value of the stolen trade secret to the organization, including expenses for research and design and other costs of reproducing the trade secret that the organization has thereby avoided.[15]

1.11.4 Protection of intellectual property and trade secrets reinforces the value of the IAF MLA, the GATT/TBT and the ISO/IEC 17065 product approval process.

1.11.5 The goal is to protect everyone's best interests while also facilitating economic freedom and opportunity by promoting free and fair competition in the marketplace.

Notes

[1] For more information, visit drjcertification.org or call us at 608-310-6748.

[2] Unless otherwise noted, all references in this report are from the 2020 version of the NBC. This alternative solution is also approved for use with the 2010 and 2015 NBC and the standards referenced therein.

[3] References in this report to the National Building Code of Canada (NBC) apply to the Ontario Building Code (OBC), unless noted otherwise.

[4] 18 U.S. Code § 1831 - Economic espionage - Whoever, intending or knowing that the offense will benefit any foreign government, foreign instrumentality, or foreign agent, knowingly steals, or without authorization appropriates, takes, carries away, or conceals, or by fraud, artifice, or deception obtains a trade secret shall be fined not more than $5,000,000 or imprisoned not more than 15 years, or both. Any organization that commits any offense described shall be fined not more than the greater of $10,000,000 or 3 times the value of the stolen trade secret to the organization, including expenses for research and design and other costs of reproducing the trade secret that the organization has thereby avoided. https://www.law.cornell.edu/uscode/text/18/part-I/chapter-90.

[5] ANAB is part of the USMCA and IAF MLA, where the purpose of these agreements are to ensure mutual recognition of accredited certification and validation/verification statements between agreement signatories, and subsequent acceptance of ANAB accredited certification and validation/verification statements by professional engineers based upon having one universal approval process for the timely approval of innovative materials, products, designs, services, assemblies and/or methods of construction.

[6] https://ctscivil.com/wp-content/uploads/2019/08/V-M-D-Diagrams.pdf; https://engineering.purdue.edu/~ce474/Docs/DA6-BeamFormulas.pdf. For assistance with beam or post specialty engineered design, please contact Owens Corning via email at oclumber@owenscorning.com.

[7] https://anabpd.ansi.org/Accreditation/product-certification/DirectoryListingAccredited?menuID=1&prgID=1

[8] https://iaf.nu/en/member-details/?member_id=91

[9] https://iaf.nu/en/member-details/?member_id=14

[10] NBC Division A Clause A-1.2.1.1.(1)(b) provides information on code compliance via alternative solutions and defines alternative solutions as "...achiev[ing] at least the minimum level of performance required by Division B." NBC Division C Section 2.3 includes additional guidance for documentation of alternative solutions.

[11] https://anabpd.ansi.org/Accreditation/product-certification/AllDirectoryDetails?&prgID=1&OrgId=2125&statusID=4

[12] Through ANAB accreditation and the IAF MLA, DrJ certification can be used to obtain material, product, design, or method of construction approval in any jurisdiction or country that has IAF MLA Members & Signatories to meet the Purpose of the MLA – "*certified once, accepted everywhere*".

[13] https://iaf.nu/en/about-iaf-mla/#:~:text=required%20to%20recognise

[14] The National Conformity Assessment Principles states, "*Product regulations and standards may vary from country to country. If these are set arbitrarily, they could be deemed as protectionist. The World Trade Organization (WTO) Agreement on Technical Barriers to Trade (TBT Agreement) is intended to ensure that technical regulations, standards and conformity assessment procedures of member countries do not create unnecessary obstacles to trade. Under the TBT Agreement, members of the WTO agree to use international standards, including conformity assessment standards and guides, as a basis for their technical requirements.*"

[15] https://www.law.cornell.edu/uscode/text/18/part-I/chapter-90