Commercial in Confidence

Design (safe) vertical loads for 26mm thick LunaComp (hollow) and LunaWood (Thermowood) spanning longitudinally

A report prepared on behalf of Consolidated Timber Holdings Ltd.

by

Professor Abdy Kermani BSc MSc PhD CEng FIStructE FIWSc

Revised
August 2012

Version 1.b

Design (safe) vertical loads for 26mm thick LunaComp (hollow) and LunaWood (Thermowood) - spanning longitudinally

Based on:

1. *Product information as supplied by the Client.*
2. *Test reports by Savonia University of Technology*
3. *Structural design to Eurocode 5 (BS EN 1995-1-1: 2004 +A1:2008) together with the requirements of EC0 and EC1.*

1. Service Classes

Three service classes are defined in Eurocode 5 BS EN 1995-1-1. These are:

Service Class 1 (SC1): characterised by a moisture content in the materials corresponding to a temperature of 20 °C and the relative humidity of the surrounding air only exceeding 65% for a few weeks per year.

Service Class 2 (SC2): characterised by a moisture content in the materials corresponding to a temperature of 20 °C and the relative humidity of the surrounding air only exceeding 85% for a few weeks per year.

Service Class 3 (SC3): climatic conditions leading to higher moisture content than in Service Class 2.

For the purpose of this report, Service Class 3 (SC3) conditions (which apply to external use) were considered.

2. Load Duration Classes

Load-duration class	Order of accumulated duration of characteristic load	Examples of loading
Permanent	more than 10 years	self weight
Long-term	6 months to 10 years	storage
Medium-term	1 week to 6 months	imposed load
Short-term	less than one week	Snow* and wind
Instantaneous		accidental load
*In areas which have a heavy snow load for a prolonged period of time, part of the load should be regarded as medium-term		

3. Client's requirements

Determination of design (safe) uniformly distributed load (UDL) values based on test results and reports by Savonia (Finland) on bending strength, stiffness and material properties of LunaComp. The analysis will be in accordance with the requirements of Eurocodes 0, 1 and 5 for boards spanning at 300mm, 400mm and 600mm centres supported on structural joists/battens.

4. Design (safe) load values for LunaComp (hollow) and LunaWood (Thermowood) panels

Notes:

1. The design loads per span values given in the following tables are based on design requirements to Eurocode 5, BS EN 1995-1-1: 2004 + A1:2008 and with a load factor for variable actions of $\gamma_Q = 1.5$.

2. Permissible deflection is considered to be $1/300^{th}$ of span.

3. Uniformly distributed loads are in kN/m^2.

4. Line loads are in kN/m run.

5. Load values are given for both single span (2 supports only – where boards are not continuous) and double spans (where boards span over 3 or more supports). Boards are assumed to be fixed to the supporting joists as recommended by the manufacturer.

6. The products detailed in this report are suitable for use for external decking and balconies provided that the manufacturer's insulation, care of use and maintenance instructions are adhered to.

7. The information and design load values are for guidance only and the liability is excluded.

Table 1: Design (Safe) Loads: Uniformly Distributed Load (UDL)

(a): Short-term design (safe) load, kN/m^2

Type	Span, 300mm		Span, 400mm		Span, 600mm	
	Single Span (2 supports)	Double Span (3 supports)	Single Span (2 supports)	Double Span (3 supports)	Single Span (2 supports)	Double Span (3 supports)
LunaComp (hollow)	31.6	51.0	16.6	26.5	4.9	7.9
LunaWood (Thermowood)	54.3	87.6	27.2	43.6	8.1	12.9

(b): Medium-term design (safe) load, kN/m^2

Type	Span, 300mm		Span, 400mm		Span, 600mm	
	Single Span (2 supports)	Double Span (3 supports)	Single Span (2 supports)	Double Span (3 supports)	Single Span (2 supports)	Double Span (3 supports)
LunaComp (hollow)	24.6	39.7	12.9	20.7	3.8	6.1
LunaWood (Thermowood)	50.4	81.4	25.2	40.5	7.4	12.0

(c): Long-term design (safe) load, kN/m^2

Type	Span, 300mm		Span, 400mm		Span, 600mm	
	Single Span (2 supports)	Double Span (3 supports)	Single Span (2 supports)	Double Span (3 supports)	Single Span (2 supports)	Double Span (3 supports)
LunaComp (hollow)	17.6	28.3	9.2	14.7	2.7	4.4
LunaWood (Thermowood)	42.7	68.8	21.4	34.3	6.4	10.1

Table 2: Design (Safe) Loads: Concentrated Line Load

(a): Short-term design (safe) load, kN/m

Type	Span, 300mm		Span, 400mm		Span, 600mm	
	Single Span (2 supports)	Double Span (3 supports)	Single Span (2 supports)	Double Span (3 supports)	Single Span (2 supports)	Double Span (3 supports)
LunaComp (hollow)	5.9	8.8	4.1	6.2	1.8	2.7
LunaWood (Thermowood)	10.2	15.5	6.8	10.1	3.0	4.5

(b): Medium-term design (safe) load, kN/m

Type	Span, 300mm		Span, 400mm		Span, 600mm	
	Single Span (2 supports)	Double Span (3 supports)	Single Span (2 supports)	Double Span (3 supports)	Single Span (2 supports)	Double Span (3 supports)
LunaComp (hollow)	4.6	6.9	3.2	4.8	1.4	2.1
LunaWood (Thermowood)	9.5	14.2	6.3	9.4	2.8	4.2

(c): Long-term design (safe) load, kN/m

Type	Span, 300mm		Span, 400mm		Span, 600mm	
	Single Span (2 supports)	Double Span (3 supports)	Single Span (2 supports)	Double Span (3 supports)	Single Span (2 supports)	Double Span (3 supports)
LunaComp (hollow)	3.3	4.9	2.3	3.4	1.0	1.5
LunaWood (Thermowood)	8.0	12.2	5.3	7.9	2.4	3.5