

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Sandwich Core Materials made of End Grain Balsa Wood

with type designation(s)
BALSASUD Standard Grade (SG)

Issued to
CoreLite Inc.
Miami FL, United States

is found to comply with
DNV GL class programme DNVGL-CP-0084 – Type approval – Sandwich core materials

Application :

Manufacturing of sandwich-structured composite.

This Certificate is valid until **2021-12-05**.

Issued at **Hamburg** on **2016-12-06**

DNV GL local station: **Hamburg Materials & Welding**

Approval Engineer: **Guido Michalek**

for **DNV GL**

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Thorsten Lohmann
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

Product description

End Grain Balsa Wood

Approved variants

BALSASUD Core Standard Grade (SG) with a nominal density of 152 kg/m³.

Approved range: 132.15 – 168.20 kg/m³

Material Properties

Variant	Nominal Density (1)	Compr. Strength (2)	Compr. Modulus (2)	Compr. Strength (3)	Compr. Modulus (3)	Shear Strength (4)	Shear Modulus (4)
BALSASUD SG	152	10.67 (6.5)	2349 (675)	1.31 (0.43)	125.3 (10.1)	2.65 (1.95)	190.6 (81,6)

(1) Nominal Density according to ISO 845 in kg/m³

(2) Compressive behavior parallel to the grain in accordance with ISO 844:2014, procedure B in MPa.

(3) Compressive behavior perpendicular to the grain in accordance with ISO 844:2014, procedure B in MPa.

(4) Shear behavior in accordance with ISO 1922 in MPa.

All values are average values based on nominal density $\pm 5\%$ and verified by testing. The values within brackets are minimum values on the basis of average – 2 stdv.

Limitation

The balsa wood complies with the applicable requirements of DNV GL and is compatible to the laminating resin and/or adhesive. Any significant changes in design and / or quality of the material will render the approval invalid.

Type Approval documentation

- Technical Data Sheet
- Test Report No. 527511 issued by DNV GL approved testing laboratory of TPI, dated October 2016.
- Test Report No. COLE041816-49 issued by NTA Nappanee IN, dated on 2016-08-22.
- Test Report No. COLE041816-45 issued by NTA Nappanee IN, dated on 2016-08-22.
- Workshop Inspection Report, issued by DNV GL Lima, Peru.

Assessed production site

Km. 24 Via Daule
Guayaquil
Ecuador

Periodical assessment

A production site with a valid Approval of Manufacturer (AoM) certificate for material in question is exempted from the obligation concerning retention and renewal assessments.

For manufacturer without a valid AoM a periodical assessment after 2.5 years and at renewal after 5 years is required.

END OF CERTIFICATE