

**TYPE APPROVAL CERTIFICATE****This is to certify:****That the Sandwich Core Materials**with type designation(s)  
**AIRCELL HTR-Series**

Issued to

**Materiales Estructurales Ligeros S.L.**  
**Vilassar de Mar, Spain**

is found to comply with

**DNV GL class programme DNVGL-CP-0084 – Type approval – Sandwich core materials****Application :****Manufacturing of sandwich-structured composites**Issued at **Hamburg** on **2021-04-29**This Certificate is valid until **2026-04-28**.DNV GL local station: **Barcelona FIS**Approval Engineer: **Joachim Rehbein**for **DNV GL**

Digitally Signed By: Roehr, Stefan

Location: DNV GL Hamburg, Germany

Signing Date: 29.04.2021 , on behalf of

**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.



Job Id: **262.1-031130-3**  
Certificate No: **TAK00001JT**  
Revision No: **1**

## Product description

A cross-linked, closed-cell PVC (Polyvinyl Chloride)-foam core material for sandwich construction.

## Approved variants

- AIRCELL HTR60
- AIRCELL HTR80
- AIRCELL HTR100
- AIRCELL HTR130

## Material Properties

Variant	Nominal Density (1)	Density Range (1)	Compr. Strength (2)	Compr. Modulus (2)	Shear Strength (3)	Shear Modulus (3)	Shear Elongation (4)	Tensile Strength (5)	Tensile Modulus (5)	HRT (6)
HTR60	60	54 - 69	1.01 (0.84)	65 (50)	0.86 (0.73)	21 (17)	29	1.98 (1.15)	97 (22)	--
HTR80	80	72 - 92	1.63 (1.44)	96 (74)	1.26 (1.09)	29 (24)	32	2.84 (1.91)	138 (58)	47
HTR100	100	90 - 115	2.40 (1.70)	160 (100)	1.73 (1.30)	46 (30)	29	3.23 (2.30)	133 (86)	-
HTR130	130	120 - 150	2.94 (2.50)	207 (150)	2.32 (2.00)	59 (45)	24	3.85 (3.20)	166 (130)	47

(1) Density according to ISO 845 in kg/m<sup>3</sup>

(2) Compressive properties according to ISO 844:2014, procedure B in MPa.

(3) Shear properties according to ISO 1922 in MPa.

(4) Shear elongation at break according to ISO 1922 in %.

(5) Tensile properties according to ASTM D 1623 in MPa.

(6) Heat Resistance temperature (HRT) in °C where the shear strength is > 80% of the shear at RT.

All values are average values and verified by testing. The values within brackets are minimum values.

## Limitation


The foam complies with the applicable requirements of DNV 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.11226, issued by DNV GL accepted testing laboratory (Approval No. GL-LZ 2312 HH), dated 2017-11-24.
- Workshop Inspection Report issued by DNV GL Venice, dated 2017-10-24.
- Quality documentation

### Renewal 2021:

- Renewal of TAK000012X, issued 2020-12-22;
- Statement of compliance, dated 2021-04-01;
- Type approval assessment report TA 401, issued 2021-03-25.




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### **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.

This certificate is only valid if required periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in <https://approvalfinder.dnvgl.com>.



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### **Remarks**

ASTM D 1621-73 procedure B and ISO 844:2014 procedure B work on the same technical principle and provide comparable test results.

ASTM C 273 and ISO 1922 work on the same technical principle and provide comparable test results.

END OF CERTIFICATE