



TYPE APPROVAL CERTIFICATE

Certificate No:
TAK000013N
Revision No:
3

This is to certify:

That the Sandwich Core Materials

with type designation(s)
Divinycell PY

Issued to

DIAB International AB
Laholm, Sweden

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

Application :

Manufacturing of sandwich-structured composite.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Hamburg** on **2022-11-23**

for **DNV**

This Certificate is valid until **2027-06-12**.

DNV local unit: **Venice**

Approval Engineer: **Gabi Dau**

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Divinycell® PY105, PY200 and PY250

A closed-cell, thermoplastic Polyethylene terephthalate (PET)-foam, with a sealed or unsealed surface, for sandwich constructions.

The following manufacturer's specified values are confirmed by type testing:

Variant	Nominal Density (1)	Density Range (1)	Compr. Strength (2)	Compr. Modulus (2)	Shear Strength (3)	Shear Modulus (3)	Shear Strength (4)	Shear Modulus (4)
Divinycell PY 105	105	100 - 115	1.50 (1.40)	112 (85)	0.95 (0.80)	25 (23)	0.85 (0.75)	23 (19)
Divinycell PY 200	200	190 - 210	3.4 (3.2)	185 (150)	1.95 (1.65)	57 (50)	1.75 (1.50)	50 (45)
Divinycell PY 250	250	240 - 255	4.4 (4.0)	210 (200)	2.5 (2.0)	70 (68)	2.2 (1.8)	60 (56)

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

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

(3) Shear properties according to ISO 1922 in MPa, parallel to welding lines.

(4) Shear properties according to ISO 1922 in MPa, perpendicular to welding lines.

All values are average values. The values within brackets are minimum values.

Responsibility

The Company (stated on the front page of this Certificate) takes the responsibility that both design and production are in compliance with Rules, Standards and/or Regulations listed on page 1 of this certificate.

Application/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.

DIAB AB, Laholm, Sweden – Manufacturer of **Divinycell® PY105**

DIAB S.p.A., Longarone, Italy – Manufacturer of **Divinycell® PY105, PY200 and PY250**

Assessed production site

Diab AB
 Norra Sofieroleden 8
 312 32 Laholm
 Sweden

DIAB S.p.A.
 Via Alemagna, 29
 32013 Faè di Longarone BL
 Italy

Type Approval documentation

1. Technical Data Sheet
2. Test Report No. issued by DIAB S.P.A. and based on test results witnessed by our surveyor, dated 2017-11-16.
3. Workshop Inspection Report issued by DNV GL Venice, dated 2017-10-24.
4. Quality documentation
5. Technical report TR21-105, dated 2021-09-28
6. Assessment report TA401 of Laholm, dated 2021-09-09
7. TDS rev. 12, dated 2022-04 and SDS rev. 3.0, dated 2021-10-08
8. Assessment report TA401 of Longarone, dated 2022-03-07
9. Test report: DNV witness testing of Divinycell PY 105-200-250, dated 2022-03-07 and 2022-03-08
10. TDS rev. 4.0 dated 12/1/2021 and SDS rev. 5.0 dated 2022-04-01
11. Rev.3: Test report to compare sealed and non-sealed surface: flexural test ASTM C393, dated 2022-07-14

Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**.

Marking of product



Job Id: **262.1-036253-2**
Certificate No: **TAK000013N**
Revision No: **3**

Product shall be marked with *manufacturer's name, place of production and type designation*. The marking is to be carried out in such a way that it is visible, legible and indelible. The marking of product is to enable traceability to the DNV Type Approval Certificate.

Periodical assessment

Periodical assessments will be required after 2 years and after 3.5 years (retention surveys) and for renewal after 5 years (renewal survey).

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.

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>

END OF CERTIFICATE