



TYPE APPROVAL CERTIFICATE

Certificate no.:
TAK000028W
Revision No:
1

This is to certify:

that the **Sandwich Core Materials**

with type designation(s)
Divinycell® PL - series

issued to

DIAB International AB
Laholm, Sweden

is found to comply with

DNV rules for classification – Ships
DNV class programme DNV-CP-0084 – Type approval – Sandwich core materials

Application:

Core material for sandwich construction.

Issued at **Hamburg** on **2025-02-24**

This Certificate is valid until **2028-06-27**.

DNV local unit: **Denmark CMC**

Approval Engineer: **Joachim Rehbein**

for **DNV**



Digitally Signed By:
Stefan Röhr
Location: **DNV Hamburg,**
Germany

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 USD 300 000.

Product description

Divinycell® PL – series: A thermoplastic polyethylene terephthalate (PET)-foam, with a sealed or unsealed surface, for sandwich constructions.

Approved variants:

Divinycell® PL100, Divinycell® PL105, Divinycell® PL150, Divinycell® PL200, Divinycell® PL230

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

Variant	Nominal Density	Heat resistance temperature	Compr. Strength ¹	Compr. Modulus ¹	Shear Strength ²	Shear Modulus ²	Shear Strength ³	Shear Modulus ³
	ISO 845 [kg/m ³]	ASTM C393 [°C]	ASTM D1621 [MPa]	ASTM D1621 [MPa]	ISO 1922 parallel to welding lines [MPa]	ISO 1922 parallel to welding lines [MPa]	ISO 1922 perpendicular to welding lines [MPa]	ISO 1922 perpendicular to welding lines [MPa]
PL100	100 (95)	≤ 50	1.3 (1.0)	100 (75)	0.85 (0.70)	23 (20)	0.80 (0.65)	21 (17)
PL105	105 (100)	≤ 50	1.5 (1.3)	112 (85)	0.95 (0.80)	25 (23)	0.85 (0.75)	23 (19)
PL150	150 (145)	≤ 50	2.5 (2.2)	165 (130)	1.45 (1.25)	42 (37)	1.35 (1.25)	36 (32)
PL200	210 (195)	≤ 50	3.8 (3.2)	230 (190)	2.1 (1.8)	65 (50)	2.0 (1.7)	55 (47)
PL230	230 (220)	≤ 50	4.5 (3.7)	245 (210)	2.6 (2.3)	76 (67)	2.5 (2.2)	66 (58)

Notes:

The values within brackets are minimum values.

All values measured at +23°C. Testing is done on foam with welding lines.

1) Properties measured perpendicular to the plane.

2) Properties measured parallel to the welding lines.

3) Properties measured perpendicular to welding lines.

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.

Assessed production sites:

Diab AB

Norra Sofieroledden 8

312 32 Laholm

Sweden

(Production of Divinycell® PL105)

Skaps Advanced Composites Pvt.Ltd

Anajani Udyog PVT. Ltd., 141 (P) Mitap, Sector 12/S, Shantipath-4

Mundra-370421, Gujarat

India

Diab Technology (Changshu) Co.ltd

No 1150 Southeast Avenue, Southeast Street, Changshu City

Jiangsu 215500

China

Type Approval documentation

Modification 2025: new variants and additional production site

Application TAA 901 of 2024-03-27;

Type approval assessment report TA 401 (SKAPS, Mundra, India) of 2024-07-16;

Type approval assessment report TA 401 (Diab Technology (Changshu) Jiangsu, China) of 2024-10-12;

Diab Technical Specification Divinycell PL CD-1765 ver. 5.0 of 2024-09-30;

Technical data sheet Divinycell PL of November 2024;

Test reports issued by Diab SpA laboratory, Longarone, Italy witnessed by DNV:

- TR24-64A of Divinycell® PL100 produced at Skaps, Mundra, India of 2024-10-14
- TR24-64B of Divinycell® PL150 produced at Skaps, Mundra, India of 2024-10-14
- TR24-64C of Divinycell® PL200 produced at Skaps, Mundra, India of 2024-10-18
- TR24-64D of Divinycell® PL230 produced at Skaps, Mundra, India of 2024-10-14

Test report issued by DIAB New Materials (Zhanjiagang) laboratory, China of 2024-10-08;

Certificate of conformance from Diab Technology (Changshu) Co. Ltd of 2024-10-08;

Test reports for China production site: witnessed reports to be submitted within the validity time of this certificate.

Initial:

TA401: Laholm, dated 2022-12-12 and Mundra, dated 2022-11-30

TDS: PL105 rev2 01-2023

SDS: Diab Group MSDS - Divinycell PN, PNX, PY, PYX, PL version 5.0 dated 2022-04-01

Test reports: TR23-13 Laholm, dated 2023-02-15 TR23-14 Mundra, dated 2023-02-15

TR23-42 Laholm, dated 2023-06-14

TR23-43 Mundra, dated 2023-06-14

Tests carried out

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

Marking of product

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.dnv.com>

END OF CERTIFICATE