



TYPE APPROVAL CERTIFICATE

Certificate No:
TAK00000M3
Revision No:
1

This is to certify:

That the Sandwich Core Materials

with type designation(s)
Divinycell® HM; HM80, HM100, HM130

Issued to
DIAB International AB
Laholm, Sweden

is found to comply with
DNV rules for classification – Ships
DNV rules for classification – High speed and light craft
DNV class programme DNV-CP-0084 – Type approval – Sandwich core materials

Application :

For use in marine vessels according to stated Rules/Standard. The core material is approved for use in areas exposed to slamming and slamming fatigue.

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

Issued at **Hamburg** on **2021-11-08**

This Certificate is valid until **2026-11-03**.

DNV local station: **Gothenburg FIS**

Approval Engineer: **Gabi Dau**

for **DNV**

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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.

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® HM: HM80, HM100 and HM130.

Core material for sandwich construction. A resilient, closed cell, foam sheet consisting of a polymeric alloy of a cross-linked aromatic polyurea and a linear vinyl polymer with dimensional stability at temperatures up to 100°C.

The manufacturer has given the following values:

Properties	Test Method	HM80	HM100	HM130		
Tensile strength	ASTM D1623	2,2	2,5	3,5	min.	MPa
Tensile modulus	ASTM D1623	80	105	135	min.	MPa
Compressive strength, 23°C	ASTM D1621	1,4	2,0	3,0	nom.	MPa
Compressive strength, 23°C	ASTM D1621	1,15	1,65	2,4	min.	MPa
Compressive modulus, 23°C	ASTM D1621-B-73	100	135	170	nom.	MPa
Compressive modulus, 23°C	ASTM D1621-B-73	80	115	145	min.	MPa
Shear strength	ASTM C273	1,15	1,6	2,2	nom.	MPa
Shear strength	ASTM C273	0,96	1,4	1,9	min.	MPa
Shear modulus	ASTM C273	27	35	50	nom.	MPa
Shear modulus	ASTM C273	22	28	40	min.	MPa
Shear elongation	ASTM C273	41	41	41	nom.	%
Density	ISO 845	80	100	130	nom.	kg/m ³
Density	ISO 845	92	115	149	max.	kg/m ³
Density	ISO 845	70	90	117	min.	kg/m ³
Slamming grade testing, shear strength	ASTM C393	1)	>1,4 (min) >1,6 (nom)	2)		

1) Not approved for use in areas exposed to slamming and slamming fatigue.

2) Not tested to slamming and slamming fatigue requirements, however, please refer to DNV's Rules for Classification of High Speed, Light Craft and Naval Surface Craft (2013), Pt.3 Ch.4, Sec.5, A105.

Remarks:

The adhesive system used in the slamming tests is POLYLITE® 506-647 (a polyester resin) Standards used for Type Testing are others than required in the Standards/Rules.

Application/Limitation

The core materials are approved for use in areas exposed to slamming and slamming fatigue.

Type Approval documentation

Tests carried out

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

Assessed production site

Diab AB
 Norra Sofieroledden 8
 SE-312 32 Laholm
 Sweden

Marking of product

Product shall be marked with *manufacturer's name*: **Diab AB, Laholm, Sweden** 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 for type approvals with a validity period of five years will be required after 2 years and after 3.5 years.

If an approval of manufacturer certificate which is still valid for at least one year is available, an exemption from the obligation concerning retention and renewal surveys listed in the class programme will apply.

END OF CERTIFICATE