



TYPE APPROVAL CERTIFICATE

Certificate No:
TAS0000JR
Revision No:
1

This is to certify:

That the Seats

with type designation(s)

Senja High, Senja Medium, Senja Low

Bahama Turn Up, Bahama Cinema

Bahama 2000, Bahama 2000 HS, Bahama 2000 Diplomat, Bahama 2000 MOLS

Senja HS recline

Issued to

Modell-Møbler AS

KRISTIANSAND S, Norway

is found to comply with

International Code of Safety for High-Speed Craft, 2000 - Annex 10

Application :

Passenger seat for Design level 1 and 2: gcoll up to 12g

Products approved by this certificate are accepted for installation on all vessels classed by DNV.

Issued at **Høvik** on **2021-07-01**

for **DNV**

This Certificate is valid until **2026-06-30**.

DNV local station: **Kristiansand S**

Approval Engineer: **Per Annar Sandaune**

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Thomas Revheim
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.



Product description

Passenger seats of 3 different designs mounted on legs/rails fixed to the deck of the craft.
Number of legs depends on number of seats and actual level of collision design acceleration.

Type/model designations:

- 'Fixed' design
 - o "Senja High"
 - o "Senja Medium"
 - o "Senja Low"
- 'Tip-Up' design
 - o "Bahama Turn Up"
 - o "Bahama Cinema"
- 'Adjustable' design
 - o "Bahama 2000"
 - o "Bahama 2000 HS"
 - o "Bahama 2000 Diplomat"
 - o "Bahama 2000 MOLS"
 - o "Senja HS recline"

The basic construction consists of bottom and back with upholstery, beam, legs and floor rails. Basic materials are aluminium profiles/plates and steel bolts/details. Upholstery consists of foams and fabrics composed of different types and quality.

Application/Limitation

The approval covers strength and mounting of seats according to the 2000 HSC Code:

- Design level 1 as specified for collision acceleration (g_{coll}) up to 3g.
- Design level 2 as specified for collision acceleration (g_{coll}) from 3g to 12g.

Seats are approved for the following conditions relative to the craft:

- Forward facing and g_{coll} up to 12g:
 - o maximum 3 seats in a row when placed on 2 legs.
 - o maximum 4 seats in a row when placed on 3 legs.
- Forward facing and g_{coll} up to 7g:
 - o maximum 4 seats in a row when placed on 2 legs, and bolts of quality 10.9 are fitted.
- Forward facing and g_{coll} up to 9g:
 - o maximum 3 seats in row when placed on 2 legs according to drawing no. MM-2011-1017 rev. 2, and lap belts are fitted.
- Rearwards facing and g_{coll} up to 9g:
 - o maximum 3 seats in row when placed on 2 legs according to drawing no. 42873.
- Forward/aft/sideways facing and g_{coll} up to 3g:
 - o "Senja HS recline", maximum 3 seats in a row when placed on 2 legs.

The seats are to be mounted to deck as tested (see documentation overleaf):

- Fixation by 4.8 mm stainless steel/monel rivets with 80 mm spacing, with an additional 6 rivets with 27 mm spacing at aft end of legs, reference made to drawings (Type 1).

The deck structure of craft is not part of this approval but is assumed approved separately.

Other mounting and g_{coll} may be accepted based on case by case approval.

Approval conditions

The Type Approval is issued based on Class Programme DNVGL-CP-0140 "Passenger and crew seats". The approval covers requirements to seats in Ch. 4.4, Ch. 4.5 and Appendix 10 of the "International Code of Safety for High-Speed Craft, 2000", as referred to in Sec. 9 of DNVGL-SI-0364 - "Statutory Interpretations – SOLAS interpretations" at date of issue.

The approval covers the strength of seat and mounting with respect to collision only.

Note: Restricted use of combustible materials according to the 2000 HSC Code Ch. 7.4.3 is not part of this approval.

Any seat/lap belts are assumed separately approved according to relevant standard.

Any changes which may influence the strength or safety of the seats shall be reported for evaluation of the possible need for revision of the approval.

Any additional equipment may be accepted based on documentation and/or survey prior to installation, showing that strength and/or safety will not be influenced.

Type Approval documentation

Seats and mounting are covered by the following main drawings/documents, references:

	Title	Drawing
Assembly	"Senja High/Medium/Low" (Type1)	NO-03-1012/1027/1052 Rev 3, dated 2011-06-05
	"Bahama TipUp/Cinema" (Type1)	NO-03-1011/1026/1051 Rev 3, dated 2011-06-05
	"Bahama 2000/HS/Diplomat" (Type1)	NO-03-1010/1025/1050 Rev 4, dated 2011-05-30
	"Bahama 2000 MOLS"	Same as "Bahama Diplomat", with different upholstery
	"Senja HS recline"	Art 2020
Bottom/back	See assembly drawings	
Beam	MOD 0101	Hydro Aluminium Profiler, dated 1988-11-28
Leg		42873, Profilgruppen AB, dated 1989-06-26 MM-2011-1017 Rev 2, dated 2012-06-05
Rail	(Type 1)	MOM 5105 A, Hydro Alu. Profiler, dated 1999-08-27
Rail Fixation	(Type 1)	MM-0008 Rev 2, dated 2011-06-05 MM-0009 Rev 1, dated 2002-10-16 NO-06-1012/1027/1052 Rev 6, Rearward, dated 2011-06-05

Materials used are specified/referred to in the drawings/documentation listed above.

<TA documentation list removed from published version>

Tests carried out

Dynamic tests according to the 2000 HSC Code Annex 10 section 3 was undertaken by Autoliv Sverige AB, reference:

- Report 02-c234, project 56299, test 1A2286, dated 2002-10-08.
 - o Covering forward test on typical aluminium deck panel.
- Report TO-11003810, project 90210, test T-11017741, dated 2011-03-22.
 - o Covering forward test with lap-belts, and moulded leg on typical aluminium deck panel.
- Report TO-12011156, project 90210, test T-12084719, dated 2012-06-28
 - o Covering rearward test on representative deck.

Lap belt test according to ECE Regulation 80 was undertaken by Väg- och transportforskningsintitutet, reference:

- Report 56497, test 961212-1, 961212-2 and 961213-1, dated 1997-06-04.
 - o Covering forward test on typical aluminium deck panel.

Static tests according to the 2000 HSC Code Annex 10 section 2 was undertaken by Modell-Møbler AS, reference:

- Report, test 070206 and 220306, dated 31.03.06 as verified by DNV 2006-03-31
 - o Covering "Type 1" set-up for 4 seats on 2 legs
- Report KRS-09-4010, dated 2008-11-25 as verified by DNV
 - o Covering set-up for 3 seats on 2 legs
- Report KRS-06-4013, dated 2006-02-07 and 2006-03-22 as verified by DNV
 - o Covering 3 seats on 2 legs with 4.6 quality bolts and 4 seats on 2 legs with 10.9 quality bolts.
- Report KRS-10-4017 Rev1, dated 2008-11-25 as verified by DNV
 - o Covering rearward facing seats
- Report KRS-12-4058, dated 2012-07-06 verified by DNV
 - o Covering 3 seats on 2 legs (moulded type)
- Report, static load test, "Senja HS recline", dated 2021-05-25 (addition to KRS-10-4017 Rev. 1), verified by DNV
 - o Covering 3 seats on 2 legs

Note: Fire test of combustible materials in accordance with the 2000 HSC Code Ch. 7.4.3 is not part of this approval.



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Marking of product

The seats are to be marked with type/model designation and name of manufacturer.

Note: MED-marking according to Maritime Equipment Directive 96/98/EC does not apply to strength of seats, but applies to fire safety of combustible materials, which is not part of this approval.

Periodical assessment

DNV may perform Certification Retention Surveys at any time during the validity period of this certificate. The arrangement is to be in accordance with the scope described in DNVGL-CP-0338.

END OF CERTIFICATE