DNV·GL

Certificate No:
**TAS00000JR**

# TYPE APPROVAL CERTIFICATE

## 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**

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**

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

This Certificate is valid until **2021-06-30**.

Issued at **Høvik** on **2016-07-01**

for **DNV GL**

DNV GL local station: **Kristiansand S**

Approval Engineer: **Per Annar Sandaune**

**Odd Arne Lyngstad**
**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.


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Job Id: **262.1-022423-2**
Certificate No: **TAS00000JR**

## Product description

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

Type/model designations:
- '*Fixed'* design : "Senja High", "Senja Medium" and "Senja Low".
- '*Tip-Up'* design : "Bahama Turn Up" and "Bahama Cinema".
- '*Adjustable*' design: "Bahama 2000", "Bahama 2000 HS" and "Bahama 2000 Diplomat".

Basic construction consists of: Back/Bottom with upholstery, Beam, Legs and Floor-Rails.

Basic materials are aluminium-profiles/plates and steel bolts/details.

Upholstery consists of foams/fabrics composed of different types and quality.

## Application/Limitation

The approval covers *strength and mounting* of Seats according to '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 3 to 12g.

Seats are approved for the following conditions *relative to the craft:*
- *Forward* facing and $g_{coll}$ up to 12g:
  -- maximum 3 seats in row when placed on 2 legs.
  -- maximum 4 seats in row when placed on 3 legs.
- *Forward* facing and $g_{coll}$ up to 7g:
  -- maximum 4 Seats in row when placed on 2 legs, and *bolts of quality 10.9 are fitted*.
- *Forward* facing and $g_{coll}$ up to 9g:
  -- maximum 3 Seats in row when placed on 2 legs acc. to drwg. MM-2011-1017 rev. 2, and *lap-belts are fitted.*
- *Rearward* facing and $g_{coll}$ up to 9g:
  -- maximum 3 Seats in row when placed on 2 legs acc. to drwg. no. 42873.

Seats are to be mounted to deck as tested (see documentation overleaf):
- Fixation by 4,8mm st.steel/monel rivets spacing 80mm with additional
  6 rivets spacing 27mm at aft end of legs, refer drawings (Type 1).

Deck structure of craft is *not* part of this approval, but is assumed separately approved.

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

## Approval conditions

Type Approval is issued based on Program 3-499.50-1 in DNV's Certification Note 2.9.
The approval covers requirements to Seats/Tables in ch. 4.4, 4.5 and Appendix 10 of the "International Code of Safety for High-Speed Craft, 2000", as referred in Pt.3 Ch.7 of DNV's: "Rules for Classification of High Speed, Light Craft and Naval Surface Craft" at date of issue.

The approval covers the strength of Seat/Table and fastening with respect to collision only.
*Note: Restricted use of combustible materials according to HSC-Code sec.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/safety of the Seat/Table, shall be reported for evaluating the need for revision of the approval.

## Type Approval documentation

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

- Assembly "Senja High/Medium/Low" (Type1) :
  dwg.no. NO-03-1012/1027/1052 Rev 3, dated 2011-06-05.
- Assembly "Bahama TipUp/Cinema" (Type1):
  dwg.no. NO-03-1011/1026/1051 Rev 3, dated 2011-06-05.
- Assembly "Bahama 2000/HS/Diplomat" (Type1):
  dwg.no. 03-1010/1025/1050 Rev 4, dated 2011-05-30.
- Bottom and Back : see Assembly drawings
- Beam : drwg.no. MOD 0101, Hydro Alu.Profiler, dated 1988-11-28.
- Leg : drwg.no. 42873, Profilgruppen AB, dated 1989-06-26.
  : drwg.no. MM-2011-1017 Rev 2, dated 2012-06-05.
- Rail (Type 1) : drwg.no. MOM 5105 A, Hydro Alu. Profiler, dated 1999-08-27.
- Rail Fixation (Type 1) : drwg.no: MM-0008 Rev 2, dated 2011-06-05.
  : drwg.no: MM-0009 Rev 1, dated 2002-10-16.
  : drwg.no: NO-06-1012/1027/1052 Rev 6, Rearward, dated 2011-06-05.

Materials used are specified/referred in drawings/documentation above.

Any Seat/Lap-belts are assumed separately approved according to relevant standard.

## Tests carried out

Dynamic test according to '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;
  Covering forward test on typical aluminium deck panel.
- Report TO-11003810, project 90210, test T-11017741, dated 2011-03-22;
  Covering forward test with lap-belts, and moulded leg on typical alu.deck panel.
- 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;
  Covering forward test on typical aluminium deck panel.
- Report TO-12011156, project 90210, test T-12084719, dated 2012-06-28;
  Covering rearward test on representative deck.

Static test according to '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;
  Covering 'Type 1' set-up for 4 seats on 2 legs.
- Report KRS-09-4010, dated 2008-11-25 as verified by DNV;
  Covering set-up for 3 seats on 2 legs.
- Report KRS-06-4013, dated 2006-02-07 and 2006-03-22 as veritfied by DNV ;
  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;
  Covering rearward facing seats.
- Report KRS-12-4058, dated 2012-07-06 verified by DNV;
  Covering 3 seats on 2 legs (moulded type).

*Note: Fire test of combustible materials in accordance with HSC-Code sec. 7.4.3 is not part of this approval.*

## Marking of product

Seats are to be marked with type/model-designation(s) and name of manufacturer.

*Note: MED-marking (acc. to Maritime Equipment Directives 96/98/EC) does not apply for strength of Seats,*

*but applies to fire safety of combustible materials, which are not part of this approval.*

## Periodical assessment

Det Norske Veritas may perform Certification Retention Surveys at any time during the validity period of this certificate. The arrangement is to be in accordance with scopes described in item 2.6.4 of Certification Note 2.9.

END OF CERTIFICATE