TYPE APPROVAL CERTIFICATE

Certificate No:
TAS00000JS
Revision No:
3

This is to certify:

That the Seats

with type designation(s)
Alutech 220, Alutech 230, Alutech 240, Alutech 250, Alutech 260
Alutech 320, Alutech 325, Alutech 330, Alutech 340, Alutech 350
Alutech 420, Alutech 425, Alutech 430, Alutech 440, Alutech 450
Alutech 520, Alutech 525, Alutech 530, Alutech 540, Alutech 550
Alutech 620, Alutech 625, Alutech 630, Alutech 640, Alutech 650
OP 620, OP 625, OP 630, OP 640, OP 650
OP10, OP11, OP12

Issued to
Alu Design & Services AS
Kristiansand S, **Norway**

is found to comply with
International Code of Safety for High-Speed Craft, 2000 - Annex 10

Application :

Pilot/crew seats for Design level 2: gcoll = 3 to 12g

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

Issued at **Høvik** on **2021-07-01**

This Certificate is valid until **2026-06-30**.
DNV local station: **Kristiansand S**

Approval Engineer: **Per Annar Sandaune**

for **DNV**

Digitally Signed By: Revheim, Thomas
Location: DNV, Høvik, Norway
Signing Date: 25.06.2021

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.

Product description

Pilot/crew seats placed on column leg at base/rails fixed to the deck of the craft.

Type/model designations:
- 200 Series: “Alutech 220”, “Alutech 230”, “Alutech 240”, “Alutech 250” & “Alutech 260”
- 300 Series: “Alutech 320”, “Alutech 325”, “Alutech 330”, “Alutech 340” & “Alutech 350”
- 400 Series: “Alutech 420”, “Alutech 425”, “Alutech 430”, “Alutech 440” & “Alutech 450”
- 500 Series: “Alutech 520”, “Alutech 525”, “Alutech 530”, “Alutech 540” & “Alutech 550”
- 600 Series: “Alutech 620”, “Alutech 625”, “Alutech 630”, “Alutech 640” & “Alutech 650”
- OP 600 Series: “OP 620”, “OP 625”, “OP 630”, “OP 640” & “OP 650”
- OP Series: “OP10”, “OP11” & “OP12”

Basic construction consists of bottom and back with upholstery, column/leg and deck base/rails.
Basic materials are aluminium profiles/plates and steel bolts/details.
Seat upholstery consists of foams and fabrics composed of different types and quality.

Application/Limitation

The type approval covers strength and mounting of seats according to the 2000 HSC Code:
- Design level 2 as specified for collision acceleration (g_{coll}) from 3 to 12g.

The seats are approved for the following conditions relative to the craft:
- Forward facing placed on 1 column/leg fixed directly to deck or to rail with 3- or 4-point belt.
  - Alutech 200 series 12g
  - Alutech 300 series 12g
  - Alutech 400 series 12g
  - Alutech 500 series 12g
  - Alutech 600 series 12g
- Forward facing placed on 1 column/leg fixed directly to deck or to rail with 2-point belt.
  - OP 600 series 7.2g
  - OP series 7.2g

The seats can be mounted on the following rails:
- Alutech 3200/3300
- Alutech 3400/3500
- Alutech 4000/4100

The seats are to be mounted to deck as tested (see documentation overleaf):
- Fixation by 6 off M10 bolts for leg/column, 18 off M6 bolts for rail carriage and M6 bolts spaced 300mm (150mm in ends) for deck rails. Bolts are stainless steel A4.

The deck structure of craft is not part of this approval.

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 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	Alutech 220 series	DNV 200 series, Rev-03.0
	AluSit 220	ALU-220, Rev-01.0
	ALU- 230	AluSit-230, Rev-03.0
	AluSit 240	ALU-240, Rev-02.0
	AluSit 250	ALU-250, Rev-02.0
	AluSit 260	ALU-260, Rev-02.0
	Firkant og seter	AS-A009, Rev-03.0
	Alutech 300 Series	Alutech 300, Rev B
	Alutech 350	Alutech 350, Rev 01.0
	Alutech 420	ALU 420, Rev 02.0, dated 10/07/12
	Alutech 425	ALU 425-200, Rev 01.0, dated 07/08/12
	Alutech 430	ALU 430-200, Rev 02.0, dated 10/07/12
	Alutech 440	ALU 440-200, Rev 02.0, dated 10/07/12
	Alutech 450	ALU 450-200, Rev 02.0, dated 10/07/12
	Alutech 520	ALU 520-200, Rev 03.0, dated 10/07/12
	Alutech 525	ALU 525-200, Rev 01.0, dated 08/08/12
	Alutech 530	ALU 530-200, Rev 02.0, dated 10/07/12
	Alutech 540	ALU 540-200, Rev 03.0, dated 10/07/12
	Alutech 550	ALU 550-200, Rev 04.0, dated 06/08/12
	Alutech 600 Series	Alutech 600, Rev B
	Alutech 650	Alutech 650, Rev 01.0
	OP10 600	OP10-600-G_Ergonomics, Rev 06.0, dated 11/05/15
Bottom	Setepute	AS-A019, Rev-03.0, date 21/01/11
	Firekant sammenstilling	AS-A036, Rev-05.0, date 21/01/11
	Firekant top med rygg	DNV_rygg_feste, Rev 0-01, date 04/05/10
Back	Alusit Rygg_Flatback	AS-A017, Rev-02.0, date 21/01/11
	Alusit 200 Rygg	AS-A028, Rev-07.0, date 21/01/11
	Ramme til rygge pute	ADS-A44, Rev 0-04, date 04/05/10
Leg/Column	Søyle. 220	AS-A119, Rev-03.0, date 01/01/01
	Søyle 230-200mm	AS-A107, Rev-02.0, date 21/01/11
	Søyle 240-200mm	AS-A109, Rev-01.0, date 28/04/11
	Søyle 250-200mm	AS-A111, Rev-01.0, date 23/02/11
	Søyle 260-200mm	AS-A113, Rev-01.0, date 02/05/11
	Søyle. 630-830mm	ADS-A4, Rev 0-02, dated 04/05/10
	Søyle 730-930	ADS-A151, Rev 0-02, dated 04/05/10
	ADS-A29	ADS-A29, Rev 0-01, dated 04/05/10
	Søyle sving sammenstilling	ADS-A50, Rev 0-02, dated 04/05/10
Rail	Alutech 3200/3400	Alutech 3200-3400, Rev 01.0, dated 20/08/12
	Alutech 3300/3500	Alutech 3300-3500_DNV, Rev 01.0, dated 20/08/12
	Alutech 3500 – Flush 1,5m	Alutech 3500, Rev 02.0, dated 22/06/10
	4000 Track 1.25m Top	40xx_1250, Rev 01.0, dated 06/08/14
	Alutech 4100	1.0m skinner. Flush., Rev 01.0, dated 08/11/13
Rail Fixation		ADS-A15, Rev 03, date 13/03/09, with further detail-drawings

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

<TA documentation list removed from published version>

Tests carried out

Dynamic test according to 2000 HSC Code Annex 10 section 3 was undertaken by Autoliv, reference:

- Test no: T-09014923, dated 2009-04-06**) ***)
- Test no: T-10095352, dated 2010-12-16
- Test no: T-10095352, dated 2011-01-04
- Test no: T-10095353, dated 2011-01-04
- Test no: T-16008784, dated 2016-01-21

Static test according to the 2000 HSC Code Annex 10 section 2 was undertaken by Alu Design & Services AS, reference:
- Test date 2007-04-25, as verified by DNV Report KRS-08.4175, dated 2008-10-16.

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

**) The seat in the test is referred to as Alutech 540 but has later changed name to Alutech 550. Models with lower designation number listed in this certificate are considered covered by this test.
***) Neck flexion/extension has not been tested.

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