

# TYPE APPROVAL CERTIFICATE

**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 Seat for Design level 2: gcoll = 3 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: **Marcus Gustafsson****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.

Job Id: **262.1-022874-2**  
Certificate No: **TAS00000JS**  
Revision No: **2**

## Product description

Pilot/Crew Seat placed on column-leg at base/rails fixed to the deck of the craft.

### Type/model designation:

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/Back with upholstery, Column/Leg and deck-Base/Rails.  
Basic materials are aluminium-profiles/plates and steel bolts/details.  
Seat-upholstery consists of foams/fabrics composed of different types and quality.

## Application/Limitation

Type approval covers *strength* and *mounting* of Seat according to '2000 HSC-Code':

- *Design level 2* as specified for *collision* acceleration/ $g_{coll}$  from 3 to 12g.

### Seat is approved for the following conditions relative to the craft:

- *Forward* facing placed on 1 leg/pillar fixed directly to deck or to rail with 3 or 4-points belt.
  - o Alutech 200 series 12g
  - o Alutech 300 series 12g
  - o Alutech 400 series 12g
  - o Alutech 500 series 12g
  - o Alutech 600 series 12g
- *Forward* facing placed on 1 leg/pillar fixed directly to deck or to rail with 2-points belt.
  - o OP 600 series 7.2g
  - o OP series 7.2g

### The seats can be mounted on the following rails:

- Alutech 3200/3300
- Alutech 3400/3500
- Alutech 4000/4100

### Seat is 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 st.steel A4.

Deck structure of craft is *not* part of this approval.

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 in ch.4.4, ch.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 and mounting 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 or safety of the Seat, shall be reported for evaluating the need for revision of the approval.

Job Id: **262.1-022874-2**  
Certificate No: **TAS00000JS**  
Revision No: **2**

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

## Type Approval documentation

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

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

Job Id: **262.1-022874-2**  
Certificate No: **TAS00000JS**  
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Materials used are specified/referred in drawings/documentation above.

Any Seat/Lap-belt is 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, 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 '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 HSC-Code sec. 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.  
Lower models listed in this certificate are considered covered by this test.

\*\*) Neck flexion/extension has not been tested.

### 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