

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Seats**

with type designation(s)
Force Series Seating (Sea Force, G-Force & Luxform)

Issued to
UES Seating (a division of UES Int'l Pty Ltd)
PENRITH NSW, Australia

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

Application :

Passenger 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.

Issued at **Høvik** on **2017-07-31**

This Certificate is valid until **2022-07-30**.

DNV GL local station: **Sydney**

Approval Engineer: **Espen Kultorp**

for **DNV GL**



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.



Product description

Passenger / Crew seats of different design variants mounted on following options:

- Designation 1 (D1): Beam and leg assembly on base rails fixed to the deck of the craft. Models: Sea Force, G-Force, Luxform.

Type/model designations:

"Force Series, Static", "Force Series, Reclining"

- Static seat on D1 mounting available with 20 configurations based on 5 heights ('Low Back'/'Medium Back Straight'/'High Back'/'High Back Extended'/'High Back Headrest') & 4 widths (450/480/500/550) – Models: Sea Force, G- Force, Luxform

- Reclining seat on D1 mounting available with 20 configurations based on 5 heights ('Low Back'/'Medium Back Straight'/'High Back'/'High Back Extended'/'High Back Headrest') & 4 widths (450/480/500/550) – Models: G-Force, Luxform

Basic construction consists of: Bottom/back with upholstery, beam / legs / deck track or individual seat mounting of legs or pedestal.

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

Seat - upholstery without / with foam is 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 ('HD Leg').

- o D1 up to 3 seats in a row placed on 2 legs ('HD Leg') 6g
- o D1 up to 5 seats in a row placed on 3 legs ('HD Leg') 6g

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

- (D1) "HD Leg setup"; fixation of 4 of M10 304SS bolts with strut nut for each HD Leg and rivets spaced 50mm (with 3 extra spaced 25mm aft of leg) for deck-rails.

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 Class Programme DNVGL-CP-0140. 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 GL'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: Arr. of seats onboard is assumed separately approved wrt safe-seating/operation and the danger of blocking at evacuation

Note: Restricted use of combustible materials according to HSC-Code sec.7.4.3 is not part of this approval.

Any Seatbelts are assumed separately approved according to relevant standard.

Any changes which may influence the strength or safety of the Seat, shall be reported for revision of the approval.

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:

- Assembly:
 - "G-Force Series Dimensions": dwg.no. D.GFS-001, Rev -, dated 18/04/12.
 - "G-Force Series Dimensions - HD Leg": dwg.no. D.GFS-002, Rev -, dated 18/04/12.
 - "G-Force Series Profiles": dwg.no. D.GFS-003, Rev -, dated 18/04/12.
 - "G-Force Series Exploded Assembly": dwg.no. D.GFS-004, Rev -, dated 18/04/12.
 - "G-Force Series Bolt Configuration": dwg.no. D.GFS-005, Rev -, dated 18/04/12.
 - "G-Force BOM, Generic": dwg.no. TD-GF-GENBOM.01, Rev -, dated 31/08/16.
 - "G-Force Layouts, HD Leg": dwg.no. TD-GF-LAV.03, Rev -, dated 17/06/16.
 - "G-Force Series Model Variations": dwg.no. TD-GF-LAV.03, Rev -, dated 31/08/16.
 - "G-Force Series Dimensions": dwg.no. D.GFS-001, Rev -, dated 18/04/12.
 - "G-Force Series Dimensions - HD Leg": dwg.no. D.GFS-002, Rev -, dated 18/04/12.
 - "G-Force Series Profiles": dwg.no. D.GFS-003, Rev -, dated 18/04/12.
 - "G-Force Series Exploded Assembly": dwg.no. D.GFS-004, Rev -, dated 18/04/12.
 - "G-Force Series Bolt Configuration": dwg.no. D.GFS-005, Rev -, dated 18/04/12.
 - "G-Force Layouts, SD Leg": dwg.no. TD-GF-LAV.01, Rev -, dated 17/06/16.
 - "G-Force Layouts, HD Leg": dwg.no. TD-GF-LAV.02, Rev -, dated 17/06/16.
 - "G-Force Series Model Variations": dwg.no. TD-GF-LAV.03, Rev -, dated 31/08/16.
 - "Luxform Recliner BOM Generic": dwg. no. TD-LFR-GENBOM, dated 19/01/15.
 - "Luxform Static BOM Generic": dwg. no. TD-LFS-GENBOM, dated 24/08/17.
 - "Sea Force BOM, Generic": dwg.no. TD-SF-GENBOM.01, Rev -, dated 17/06/16.

- Bottom:
 - "Marine Recliner Seat Harness - 500mm": dwg.no. D.SC-026, Rev -, dated 14/02/12.
 - "Cast Marine Seat Harness": dwg.no. US-110613, Rev -, dated 11/06/13.
 - "UES Modular Extrusion": dwg.no. UES-TS7300.ED2, Rev -,dated 02/11/2010.
 - "Marine Cast Harness, Left": dwg.no. TD-CAS-9122-L, Rev -, dated 31/08/2016.
 - "Marine Cast Harness, Right": dwg.no. TD-CAS-9122-R, Rev -, dated 31/08/2016.
 - "Marine Cast X-Harness, Left": dwg.no. TD-CAS-9125-L, Rev -, dated 31/08/2016.
 - "Marine Cast X-Harness, Right": dwg.no. TD-CAS-9125-R, Rev -, dated 31/08/2016.
 - "Solid Stretch Rail - 450 mm": dwg.no. TD-CAS-9170-450, Rev -, dated 31/08/2016.
 - "Solid Stretch Rail - 480 mm": dwg.no. TD-CAS-9170-480, Rev -, dated 31/08/2016.
 - "Solid Stretch Rail - 500 mm": dwg.no. TD-CAS-9170-500, Rev -, dated 31/08/2016.
 - "Dogbone, 480 mm": dwg.no. TD-CAS-9102-480, Rev -, dated 31/08/2016.
 - "Dogbone, 500 mm": dwg.no. TD-CAS-9102-500, Rev -, dated 31/08/2016.

- Back:
 - "Crossrail, 480mm": dwg.no. D.SC-002.48, Rev -, dated 14/02/12.
 - "Crossrail, 500mm": dwg.no. D.SC-002.50, Rev -, dated 14/02/12.
 - "Stretch Rail Casting": dwg.no. D.SC-003, Rev -, dated 14/02/12.
 - "Recliner Arm - Left": dwg.no. TD-CAS-9118-L, Rev -, dated 31/08/2016.
 - "Recliner Arm - Right": dwg.no. TD-CAS-9118-R, Rev -, dated 31/08/2016.
 - "Recliner Crossbar - 500mm": dwg.no. D.SC-019, Rev -, dated 14/02/12.
 - "Recliner Hinge": dwg.no. TD-CAS-9121, Rev -, dated 31/08/2016.
 - "Extruded Recliner Crossbar": dwg.no. US-110613, Rev -, dated 11/06/13.
 - "UES Modular Extrusion": dwg.no. UES-TS7300.ED2, Rev -,dated 02/11/2010.
 - "M Corner Casting": dwg.no. TD-CAS-9107, Rev -, dated 31/08/2016.

- Beam:
 - "Beam End Cap": dwg.no. TD-CAS-9035, Rev -, dated 31/08/2016.
 - "Beam End Cap, Tapped Leg": dwg.no. TD-CAS-9045, Rev -, dated 31/08/2016.
 - "Seat Beam": dwg.no. UES-002, Rev 1, dated 22/10/09.

- Leg:
 - "Top Leg Bracket": dwg.no TER-T015, Rev -, dated 20/06/10.
 - "Top Cast Leg Bracket": dwg.no US-110613, Rev -, dated 11/06/13.
 - "HD Top Leg Casting": dwg.no. D.SC-020, Rev -, dated 14/02/12.
 - "HD Leg Extrusion (Heavy Duty)": dwg.no UES-007, Rev -, dated 06/09/11.

"Standard Leg Extrusion", dwg.no. UES-001, Rev-, dated 22/10/09
"Leg Assembly": dwg.no. D.TLA-001 sheet 1/2, Rev B, dated 19/08/14.
"Heavy Duty Leg Assembly": dwg.no. D.TLA-001 sheet 2/2, Rev B, dated 19/08/14.
"Leg Top Plate, HD": dwg.no. TD-CAS-9020, Rev -, dated 31/08/2016.
"Leg Top Plate, SD": dwg.no. TD-CAS-9022, Rev -, dated 31/08/2016.
"Heavy Duty Leg Assembly (HD Leg)": dwg.no. TD-DMA-001 Rev-, dated 23/02/16
"Standard Leg Assembly (SD Leg)": dwg.no. TD-DMA-001 Rev-, dated 23/02/16

- Rail: "Seat Track": dwg.no. UES-003, Rev 2, dated 16/07/10.
"Deck Track, Weldable – dimensions": dwg.no. UES-004, Rev -, dated 03/04/14.
"Deck Track": dwg.no. TD-EXT-7100, Rev -, dated 22/06/16.
"Deck Track": dwg.no. TD-EXT-7111, Rev -, dated 03/04/14.
"Low Profile Deck Track": dwg.no. TD-EXT-7100LP, Rev -, dated 17/10/16.
- Rail Fixation: "Deck Track mounting dimensions – rivoted": dwg.no. D.SM-001, Rev -, dated 02/04/2012.
"Deck Track Fixture Requirements": dwg.no. D.TLA-003, Rev -, dated 19/08/14.
"Deck Track Fixture Requirements": dwg.no. TD-DMA-001, Rev -, dated 25/02/16.

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

Any Seatbelt 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 APV Engineering and Test Services. Pty. Ltd., reference:

- Test date 2017-05-25, as verified by DNV GL-Report 22925459, dated 2017-05-30.

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 DNVGL-CP-0338.

END OF CERTIFICATE