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# DET NORSKE VERITAS

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## TYPE APPROVAL CERTIFICATE

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**CERTIFICATE NO. A-11419**  
This Certificate consists of 3 pages

*This is to certify that the*  
**Loading Computer System**  
*with type designation(s)*  
**C-LOADING vers. v4**

*Manufactured by*  
**Jotron Consultas**  
HORTEN, Norway

*is found to comply with*  
Det Norske Veritas' Rules for Classification of Ships and Det Norske Veritas' Offshore Standards

*Application*  
Type approved for calculation and control of loading conditions with respect to requirements for

Control of Shear force and Bending moments against limit curves\* Correction of shear Force for Tanker\* Intact and Damage Stability for Tankers

*Place and date*  
Høvik, 2009-08-17

for DET NORSKE VERITAS AS

Anne V. Hartmann  
Head of Section

*This Certificate is valid until*  
2013-12-31

Aniko Horvath  
Surveyor

*Local Office*  
DNV Sandefjord

**Notice: 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.**

If any person suffers loss or damage which is proved to have been caused by any negligent act or omission of Det Norske Veritas, then Det Norske Veritas shall pay compensation to such person for his proved direct loss or damage. However, the compensation shall not exceed an amount equal to ten times the fee charged for the service in question, provided that the maximum compensation shall never exceed USD 2 million. In this provision "Det Norske Veritas" shall mean the Foundation Det Norske Veritas as well as all its subsidiaries, directors, officers, employees, agents and any other acting on behalf of Det Norske Veritas.



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## Product description

### *Available Options of software:*

Based on the stored characteristic data and 3D model of the vessel and loading data given by the user, the following functions are performed on board monohull vessels:

#### Hull Strength:

1. Calculation of still water shear force and bending moment and control against limit values.

#### Stability:

1. Calculation of draft, trim and metacentric height (GM)
2. Calculation and control of:
  - Intact stability; DNV Main Class ✕ 1A1; Corresponding to Ch. 3.1 and to Ch. 3.2 of IMO Res. A.749
3. Calculation and control of loading conditions with respect to damage stability criteria according to MARPOL Regulation 28, IMO IBC Code Ch.2 and IMO IGC Code Ch.2

## Type Approval documentation

The type approval is based on the following documentation:

#### Intact and longitudinal strength

- RN ARKHANGELSK Id.no 26891
- TRANS FJELL Id.no 25971

#### Damage stability:

- FRONT PUFIN DNV Id.no 15931
- ATTILIO LEVOLI DNV Id.no 25876

## Approval conditions

The loading computer is considered as supplementary to the approved stability booklet and loading manual onboard

Specific approval and certification is required for each vessel at which the program is installed. Documentation to be submitted for approval is listed in DNV Rules for Ships Pt.6 Ch.9. The identification of software will be recorded in the certificate.



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The program is either to be installed on one approved hardware (type approved or case-by-case approved), or it is to be installed on two nominated computers. If two nominated computers are available, approval of hardware may be waived, but both the two nominated computers are subject to certification. In case of not approved hardware, there will then be two nominated computers available in case of failure of one.

### **Limitation**

The type approval is valid only for the calculation results. I.e. the type approval is a confirmation that the software is able to give correct results provided that the stored characteristic data of the vessel and the user's input is correct.

### **Certificate retention/renewal survey**

The scope of the retention/renewal survey is to verify that the conditions stipulated for the type approval is complied with and that no alterations are made to the product or software design.

The main elements of the survey to be dealt with:

- Ensure that documentation for the type approval is available.
- Ensure that the type approved software complies with the referenced documents and specifications.
- Review of possible changes in design and performance of the type approved software version.
- Ensure traceability between manufacturer's product marking and the DNV Type Approval Certificate.

END OF CERTIFICATE