Part 5 Ship types

Chapter 8 Dredgers and hopper barges
FOREWORD

DNV GL rules for classification contain procedural and technical requirements related to obtaining and retaining a class certificate. The rules represent all requirements adopted by the Society as basis for classification.

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CHANGES – CURRENT

This is a new document.
The rules enter into force 1 July 2016.
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### Changes – current

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SECTION 1 DESIGN LOADS AND ARRANGEMENT REQUIREMENTS FOR VESSELS FOR DREDGING ACTIVITIES AND HOPPER BARGES

1 Symbols

\[ L = \text{rule length [m] defined in Pt.3 Ch.1 Sec.1 [1]} \]
\[ \rho = \text{density of the water and spoil mixture; as a general rule, the value of } \rho \text{ may be taken not greater than 1.8 t/m}^3 \]

2 General

2.1 Application

2.1.1 Vessels complying with the requirements of this section are eligible for the assignment of one of the following type and service notations, as defined in Pt.1 Ch.2 Sec.2 [6.1.1] to Pt.1 Ch.2 Sec.2 [6.1.4].
- Dredger
- Hopper dredger
- Hopper barge
- Split hopper barge.

2.1.2 Vessels dealt with in this section shall comply with the requirements stated under Pt.1, Pt.2, Pt.3 and Pt.4 of the rules for inland navigation vessels, as applicable, and with the requirements of this section, which are specific to vessels for dredging activities.

2.1.3 Only ranges of navigation IN(0.6), IN(1.2) and IN(2) may be assigned.

2.1.4 Dredging equipment and installations are not covered by these rules.

2.2 Dredger types

2.2.1 Hopper dredger and hopper barge
Hopper dredger and hopper barge are vessels intended to carry out dredging operations and having one or several hopper spaces in the midship region, or a suction pipe well.

2.2.2 Dredger
A dredger is a vessel intended to carry out dredging operations and that does not carry spoil, such as bucket dredger.

2.2.3 Split hopper barge
A split hopper barge is an hopper barge which opens longitudinally around hinges.

2.3 Documents to be submitted

In addition to the documentation requested in the Pt.3 Ch.1 Sec.2, the following documents shall be submitted to the Society:
- calculation of the maximum still water bending moments
- dredging equipment weight and distribution
- other equipment weight and distribution.
3 Arrangement

3.1 Transverse rings

3.1.1 General
Transverse rings shall be provided abreast the hopper spaces, spaced not more than \((1.1 + 0.025 \cdot L)\) apart. Rings located in the same cross section shall be connected by means of a deep floor and a strong beam at deck level.

3.1.2 Gusset stays for coamings
Gusset stays for coamings shall be fitted in way of the transverse rings to which they shall be securely fixed.

3.2 Transverse and longitudinal bulkheads
It is recommended to provide a chafing allowance for plates subjected to rapid wear such as (hopper space bulkheads, weir).

3.3 Suction pipe well
As far as the operation of the vessels permits it, the side compartments shall be firmly connected together unless adequate arrangements are made and approved by the Society. Longitudinal strength continuity shall be ensured. The top and bottom of the side compartments shall be correctly connected to elements beyond the transverse bulkheads of the well by means of large horizontal brackets.

3.4 Hopper space structure
At the ends of the hopper space, the transverse bulkheads shall extend from one side to the other of the vessel. Where this is not the case, web rings with special scantlings shall be provided.

3.5 Particular arrangements

3.5.1 Dredgers
Where dredgers are likely to work in association with hopper barges, the sheerstrake shall be protected. This can be accomplished slightly below the deck by a fender efficiently secured to the shell plating and extending at least over two thirds of the vessel length. The necessary compensations shall be provided in way of the break in the raised deck, if any.

3.5.2 Bucket dredgers
Dangerous flooding in case of damage to shell plating by metal debris (e.g. anchors) shall be avoided. A watertight compartment shall be provided at the lower part of the caissons on either side of the suction pipe well in the area of the buckets. The compartment shall be of sufficient size to allow surveys to be carried out.

3.6 Shifting of the structures at ends of the hopper spaces
Continuity of the longitudinal members shall be ensured at the ends of the hopper spaces. The ends of the longitudinal bulkheads shall be extended upwards and downwards by large brackets each having, a rule length and width equal to about \(0.25 \cdot D\).
Under the lower brackets, the bottom shall be stiffened by means of a solid keelson extending beyond the bracket end over three frame spaces at least.
As a general rule, the coaming sides shall extend beyond the hopper space ends over 1.5 times their height approximately.

4 Design loads

4.1 Cargo load
The cargo load transmitted to the hull structure shall be determined in compliance with Pt.3 Ch.2 Sec.3 [6] where the cargo density of the water and spoil mixture, shall not be taken less than 1.8 t/m$^3$.

5 Hull scantlings

5.1 Split hopper barge
Scantlings and arrangements of vessels with type and service notation Split hopper barge will be considered on a case-by-case basis, considering the applicable requirements of the Rules.

5.2 Shell plating and topside plating
The net scantlings of the shell plating and the topside plating shall be determined in compliance with the applicable requirements stated under Ch.1 Sec.2 or Ch.7 Sec.1.

5.3 Framing structure

5.3.1 The net scantlings of the hull structure shall be determined in compliance with the applicable requirements stated under Ch.1 Sec.2 or Ch.7 Sec.1.

5.3.2 Transverse rings
The ring component scantlings shall be considered by the Society on a case-by-case basis.
The gusset stays for coamings shall have a section modulus at the lower end level not less than that of the web frames or the side transverses.

5.3.3 Transverse web plates in the side tanks abreast the hopper spaces
The scantlings of these web plates shall be considered by the Society on a case-by-case basis.

5.4 Rudders
The rudder stock diameter obtained from Pt.3 Ch.6 Sec.1 shall be increased by 5%.
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