



GUIDE FOR

MATERIAL REQUIREMENTS FOR HIGHER-DUCTILITY HULL STRUCTURAL STEEL PLATES AND SECTIONS

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Foreword

Higher-ductility (HD) steel has higher elongation and can absorb more energy without rupturing than conventional steel. HD steel can be used for side structure to improve structural safety and prevent cargo leakage in a collision.

This Guide provides supplementary requirements for the application of HD hull structural steel plates and sections in addition to the requirements specified in the *ABS Rules for Materials and Welding (Part 2)*.

This Guide can be used by steel mills, designers, shipyards and ship owners to support the optional notation **HDS**.

This Guide becomes effective on the first day of the month of publication.

Users are advised to check periodically on the ABS website www.eagle.org to verify that this version of this Guide is the most current.

We welcome your feedback. Comments or suggestions can be sent electronically by email to rsd@eagle.org.



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SECTION 1 Introduction

1 General

This Guide is to be used in conjunction with the following ABS Rules:

- Part 2, *ABS Rules for Materials and Welding*
- Part 3, “Hull Construction and Equipment” of the *ABS Rules for Building and Classing Steel Vessels (Steel Vessel Rules)*
- Part 7, *ABS Rules for Survey After Construction*

3 Higher-Ductility (HD) Steel Designation

This Guide describes the supplementary requirements for higher-ductility (HD) designation for hull structural steel plates and sections with the thicknesses up to 50 mm (2.0 in.).

The regular ship steel grade designation is to be followed by the HD steel designation letters and numbers HDxx, where “xx” is to be either 35 or 50. The minimum elongation for HD35 and HD50 is to be as listed in Section 3, Tables 1 and 2 in this Guide for the applicable type of specimen, which is to have approximately 35% and 50% improved elongation, compared to the same grade steel required by *ABS Rules for Materials and Welding (Part 2)*.

5 Application

The application of steel is to follow the steel selection criteria for Hull Construction and Equipment in 3-1-2/3 of the *Steel Vessel Rules*.

The minimum extent of HD steel is to be the side shell plates and frames within the cargo hold region. Frames include longitudinal and transverse stiffeners but exclude web frames, stringers or other deep support members. The cargo hold region is the part of the ship that contains cargo holds, cargo tanks, and slop tanks. The cargo hold region does not include the pump room, if any. The vertical extent is to be from the upper turn of the bilge to the bottom of the sheer strake within the midship. The same vertical extent is to be maintained forward and aft. HDS need not be applied further inboard than 0.025 times the breadth of the vessel at a particular section from the ship side at the level of the summer load line draft, see Section 1, Figure 1.

7 Classification Notation

7.1 General

The general requirements in Subsection 1/1 are to be complied with. Additional requirements for higher-ductility steel are given in the following Sections of this Guide.

7.3 HDS

The optional **HDS** notation will be assigned if the requirements in this Guide and minimum extent for application are met.

Detailed information on the extent of HD steel can be entered into the *Record* as comments. For example, “HDxx applied to Cargo Tanks and Fuel Oil Tanks”.

9 Submittals

The following information is to be submitted:

- Material specification
- Material test report
- Welding procedure
- Location and extent of application
- Vessel drawings with detailed application of HD steel

FIGURE 1
Minimum Extent of Application of Higher-Ductility Steel

