# Material Factors of Rolled Stainless Steel and Stainless Clad Steel Plates

**Amended Rules and Guidance**

Rules for the Survey and Construction of Steel Ships Parts C and CS
Guidance for the Survey and Construction of Steel Ships Part C

**Reason for Amendment**

The formulae for calculating material factors for rolled stainless steel and stainless clad steel plates specified in Chapter 1 of both Part C and Part CS are to be applied to steel having a specified minimum proof stress of 355N/mm$^2$ or less. The current versions of these formulae are based upon the performance data of high tensile steel available at the time the formulae were lasted amended in 2003. In addition, these formulae take into account the effects of the loss of proof strength which occurs at high temperatures because the aforementioned steels are often used in the cargo holds of chemical tankers where they can be exposed to high temperature cargoes.

In recent years, there has been considerable discussion regarding the possibility of using either duplex stainless steels or high tensile stainless steels, both of which have specified minimum proof stresses exceeding 355N/mm$^2$, as the materials for the bulkheads between the cargo holds of chemical tankers instead of the stainless steels currently required to be used. In consideration of these new circumstances, the formulae for calculating material factors are revised to so that they can also be used for stainless steels whose specified minimum proof stresses exceed 355N/mm$^2$.

For this amendment, the material factors for stainless steels whose specified minimum proof stresses exceed 355N/mm$^2$ were determined based upon the results of high temperature tensile and fatigue tests for duplex stainless steel carried out as a part of a joint research project with relevant industries as well as the test results of other high tensile stainless steels. Accordingly, relevant requirements were amended based upon these results.

In addition to the above, the amendment also specified that separate fatigue strength and buckling strength analyses are required when high tensile steels are used and that such analyses are to be in accordance with application location.

**Outline of Amendment**

(1) Added formulae for calculating material factors for stainless steels with specified minimum proof stresses exceeding 355N/mm$^2$ to existing formulae in the Rules.
(2) Specified lower limits for material factors for areas where stress is highly concentrated. However, such limits may be changed as needed based upon the results of detailed fatigue strength assessments.
(3) Specified that data corresponding to the standard of steel used (e.g., extent of use, location of structural members, section rigidity, buckling strength, minimum thickness, etc.) is required to be submitted to the Society for approval when deemed necessary.