



RUSSIAN MARITIME REGISTER OF SHIPPING

CIRCULAR LETTER

No. 314-53-1110c

dated **22.03.2018**

Re:

amendments to the Rules for the Classification and Construction of Sea-Going Ships, 2018, ND No. 2-020101-104-E, in connection with entering into force of a new revision of IACS UR W11(Rev.9 May 2017) "Normal and Higher Strength Hull Structural Steels"

Item(s) of technical supervision:

rolled products of hull structural steel

Implementation:
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Number of pages: 1+4

Appendix(-ces):

text of amendments to Part XIII "Materials"

Director General

K.G. Palnikov

Text of CL:

We hereby inform that in connection with entering into force of a new revision of IACS UR W11(Rev.9 May 2017) "Normal and Higher Strength Hull Structural Steels", the Rules for the Classification and Construction of Sea-Going Ships shall be amended as specified in the Appendix to the Circular Letter. The above amendments will be introduced into the Rules at their re-publication.

It is necessary to do the following:

1. Familiarize the RS surveyors with the content of the Circular Letter.
2. Bring the content of the Circular Letter to the notice of the interested organizations in the area of the RS Branch Offices' activity.
3. Apply the provisions of the Circular Letter.

List of amended and introduced paras/chapters/sections of ND (to specify in the List of Circular Letters (form 8.3.36)):

Part XIII: paras 3.2.1.4, 3.2.6, 3.2.7

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**RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF SEA-GOING SHIPS,
2018, ND No. 2-020101-104-E**

PART XIII. MATERIALS

Para 3.2.1.4 shall be amended to read:

"3.2.1.4 The rolling procedures for normal and higher strength steels used by a manufacturer shall comply with the condition of supply given in 3.2.4, and for higher strength Grade F steel with that given in 3.5.2.4, and for higher strength steel with that given in 3.13.4.

The applicable rolling procedures are presented in Table 3.2.1.4 in the form of diagrams, and their definitions are given below.

As rolled (AR) means procedure, which involves steel being cooled as it is rolled with no further heat treatment. The rolling and finishing temperatures are typically in the austenite recrystallization region and above the normalizing temperature. The strength and toughness properties of steel produced by this process are generally less than steel heat treated after rolling or than steel produced by advanced processes.

Normalizing (N) means procedure, which involves heating and holding rolled steel above the critical temperature, A_{c3} , and in the lower end of the austenite recrystallization region for a specific period of time, followed by air cooling. The process improves the mechanical properties of as rolled steel by refining the grain size and homogenizing the microstructure.

Controlled rolling (CR) (Normalizing rolling (NR)) means rolling procedure in which the final deformation is carried out in the normalizing temperature range, allowed to cool in air, resulting in a material condition generally equivalent to that obtained by normalizing.

Thermo-mechanical rolling (TM) means a procedure, which involves the strict control of both the steel temperature and the rolling reduction. Generally, a high proportion of the rolling reduction is carried out close to the A_{r3} temperature and may involve the rolling in the dual phase temperature region.

Unlike controlled rolled (normalized rolling), the properties conferred by TM cannot be reproduced by subsequent normalizing or other heat treatment.

The use of accelerated cooling on completion of TM-rolling as well as the use of tempering after completion of TM-rolling shall be agreed with the Register.

Accelerated cooling (AcC) means a process, which aims to improve mechanical properties by controlled cooling with rates higher than air cooling immediately after the final TM-rolling operation. Direct quenching is excluded from accelerated cooling.

The material properties conferred by TM and AcC cannot be reproduced by subsequent normalizing or other heat treatment.

Quenching and Tempering (QT): quenching involves a heat treatment process in which steel is heated to an appropriate temperature above the A_{c3} , held for a

specific period of time, and then cooled with an appropriate rate for the purpose of hardening the microstructure; tempering subsequent to quenching is a process in which the steel is reheated to an appropriate temperature not higher than the A_{c1} , maintained at that temperature for a specific period of time to restore toughness properties (KV) by improving the microstructure and reduce the residual stress caused by the quenching process."

Table 3.2.1.4 shall be amended to read:

Steel structure	Temperature	Type of processing							
		Conventional processes				Thermo-mechanical processes			
		AR	N	CR(NR)	QT	TM			
Recrystallized austenite	Normal slab heating Temperature Normalizing or quenching temperature								
Non-recrystallized austenite	A_{r3} or A_{c3}								
Austenite + Ferrite	A_{r1} or A_{c1}								
Austenite + Pearlite or Ferrite + Bainite	Tempering temperature								
Symbols: AR – As rolled; N – Normalizing; CR (NR) – Controlled rolling (Normalizing rolling); QT – Quenching and Tempering; TM – Thermo-mechanical rolling (thermo-mechanical controlled process); R – reduction; (*) – rolling in the dual phase temperature region of austenite and ferrite; AcC – Accelerated cooling; ◇ — start rolling temperature; ————delays to allow cooling before finishing rolling process.									

New para 3.2.6.5 shall be introduced reading as follows:

"3.2.6.5 Where the ultrasonic testing shall be performed as required by conditions of supply, such a testing shall be carried out in accordance with the RS-recognized international or national standard.

The ultrasonic testing is the responsibility of the manufacturer. Technical supervision during the testing shall not absolve the manufacturer from this responsibility."

Para 3.2.7 shall be amended to read:

"3.2.7 Surface quality.

3.2.7.1 The steel shall be free from surface defects prejudicial to the use of the material for the intended application.

The requirements specified below do not apply to steel products in forms of bars and tubulars.

Unless otherwise specified, the finished rolled product shall have a surface quality in accordance with recognized standards such as EN 10163.

3.2.7.2 The responsibility for meeting the surface quality of the rolled products with the requirements of the RS-recognized standards rests with the manufacturer. The quality system of the firm (manufacturer) shall provide for a required scope of surface finish inspection prior to delivery to the customer. Where a material is found to be defective at final production stages, the repair may be performed according to the RS-approved documentation.

3.2.7.2.1 The surface quality of the rolled product shall be inspected in accordance with international or national standards agreed between the customer and manufacturer, and recognized by the Register.

3.2.7.2.2 If agreed by the manufacturer and customer, steel may be supplied with improved surface finish than specified in this Part of the Rules.

3.2.7.3 Acceptance criteria.

3.2.7.3.1 Minor imperfections, for example pitting, rolled-in scale, roll marks, scratches and grooves, regarded as being inherent of the manufacturing process, are permissible irrespective of their number, provided the maximum permissible limits of Class A of EN 10163-2 standard or limits specified in an equivalent international or national standard recognized by the Register, are not exceeded. In such case, the requirements specified in 3.2.8 shall be complied with.

Total affected area with such imperfections shall not exceed the specified limits and 15 % of the total rolled surface in question.

3.2.7.3.2 Imperfections with a depth exceeding the limits of Class A of EN 10163-2 standard or an equivalent international or national standard recognized by the Register shall be repaired irrespective of their number. Cracks, injurious surface flaws, laminations, sharp edged seams (elongated defects) and other defects visually evident on surface or edge of the rolled product impairing the end use of the product require chipping or grinding followed by welding, irrespective of their number.

3.2.7.4 Repair of defects.

3.2.7.4.1 Grinding may be applied provided the following conditions are met:

.1 surface defects may be eliminated by local grinding to the depth not exceeding 7 % of nominal thickness but not more than 3 mm in any case. The sum of all ground areas shall not exceed 2 % of the surface in question;

.2 each single ground area shall not exceed 0,25 m²;

.3 sum of all ground areas shall not exceed 2 % of the total surface in question;

.4 defects lying in a distance less than their average breadth to each other shall be regarded as one single area;

.5 grinding depth for defects lying opposite each other on back surfaces shall not exceed the values specified in 3.2.7.4.1.1.

During defect elimination and repair of rolled products, average thickness shall remain within the tolerance complying with the requirements of 3.2.8.

3.2.7.4.2 Welding repair.

Welding repair procedures and methods for surface defects shall be submitted to the Register for approval. Repair of defects by welding in accordance with 3.2.7.3.2 shall be followed by magnetic particle or liquid penetrant testing.

Local defects which cannot be eliminated in accordance with 3.2.7.4.1 may be repaired by welding upon agreement with the Register subject to the following conditions:

- .1 any single welded area shall not exceed 0,125 m² and the sum of all areas shall not exceed 2 % of the surface side in question;
- .2 distance between welded areas shall not be less than their average width;
- .3 weld preparation shall not reduce the thickness of the product by more than 20 % of the nominal thickness;
- .4 when the depth of the welded defect is equal to or exceeds 3 mm, ultrasonic testing shall be carried out in accordance with the RS-approved procedure;
- .5 welding shall be carried out by qualified welders using an approved procedure and electrodes. Welding consumables with controllable hydrogen content in the deposited metal shall be stored and calcinated prior to use in compliance with the manufacturer's recommendations."