RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

RULES

Part M Welding

2011 AMENDMENT NO.2

Rule No.82 1st November 2011

Resolved by Technical Committee on 7th July 2011

Approved by Board of Directors on 27th September 2011

Rule No.82 1st November 2011
AMENDMENT TO THE RULES FOR THE SURVEY AND CONSTRUCTION OF STEEL SHIPS

"Rules for the survey and construction of steel ships" has been partly amended as follows:

Part M WELDING

Chapter 4 WELDING PROCEDURE AND RELATED SPECIFICATIONS

4.1 General

4.1.3 Execution of Tests

Sub-paragraph -1 has been amended as follows.

1 For the approval of welding procedure and related specifications, the tests specified in **4.2** ~~**or**~~**,** **4.3** or **4.4** are to be carried out based on the representing conditions, such as the edge preparation, welding parameter, etc., described in the welding procedure specification, with satisfactory results. However, for quenched and tempered high tensile rolled steel for structure, the tests are to be carried out every heat treatment.

Sub-paragraph -5 has been amended as follows.

5 For qualification tests for stainless clad steels, the requirements specified in **4.2** ~~**and**~~**,** **4.3** and **4.4** are to be complied with. However the impact test may be dispensed with where other welding procedure qualification on the stainless clad steel base metal has been approved under the same welding condition.

4.1.4 Range of Approval

Sub-paragraph -1(1) has been amended as follows.

1 The scope of approval of the welding procedure and related specifications of rolled steels for hull and quenched and tempered high tensile rolled steel for structure are in accordance with the following **(1)** through **(6)**, on the condition that other welding conditions are same. However, the range of approval differing from the requirements specified in this Chapter may be accepted that it is deemed appropriate by the Society.

(1) Kind of weld joints
Kind of weld joints is in accordance with in **Table M4.1**. Where the welding procedures for butt welding are approval, the kinds of weld joints include the fillet weld joints and the T-joints with full penetration, corresponding to the welding position applied for the butt weld joint.

Section 4.4 has been added as follows.

4.4 Tests for T-joints with Full Penetration

4.4.1 Application

The requirements in **4.4** apply to the T-joints with full penetration of materials prescribed in **Table M4.4** or equivalent materials welded by a manual, semi-automatic or automatic welding method.

4.4.2 Kinds of Test

T-joints with full penetration are to be subjected to finished inspection, macro-structure inspection, hardness test and non-destructive inspection test.

4.4.3 Test Assemblies

1 Test assembly is to be prepared with the same or equivalent material used in the actual work.
2 The dimensions and type of test assembly are to be as indicated in **Fig. M4.8**.
3 Test assemblies are to be welded in the general conditions specified in welding procedure specifications.
4 The tack welds of test piece are to be the same procedure as actual work.

4.4.4 Finished Inspection

Welded surface is to be regular and uniform and is to be free from injurious defects, such as cracks, undercuts, overlaps, etc.

4.4.5 Macro-structure Inspection

1 The transverse section of test specimens taken from the welded joint is to be etched and examined, and is to show that there are no crack, poor penetration, lack of fusion and other injurious defects.
2 Macro examination shall include about 10 *mm* unaffected base metal.

4.4.6 Hardness Test

1 Vickers hardness is to be measured at the position shown in **Fig. M4.9**. The kinds of specimens for Vickers hardness are to be in accordance with the requirements specified given in **Table M4.10**.
2 The number of specimens for hardness test are to be one.

4.4.7 Non-destructive Inspection

1 Internal inspections by radiographic examination or ultrasonic examination, and surface inspections by magnetic particle examination or liquid penetrant examination are to be carried for whole length of the welding. The result of non-destructive inspection is to show that there are no crack, poor penetration, lack of fusion and other injurious defects.
2 In case any post-weld heat treatment is required or specified, non-destructive inspection test is to be performed after heat treatment.
3 Quenched and tempered high tensile rolled steel for structure is to be delayed for minimum of 48 hours, unless heat treatment has been carried out.

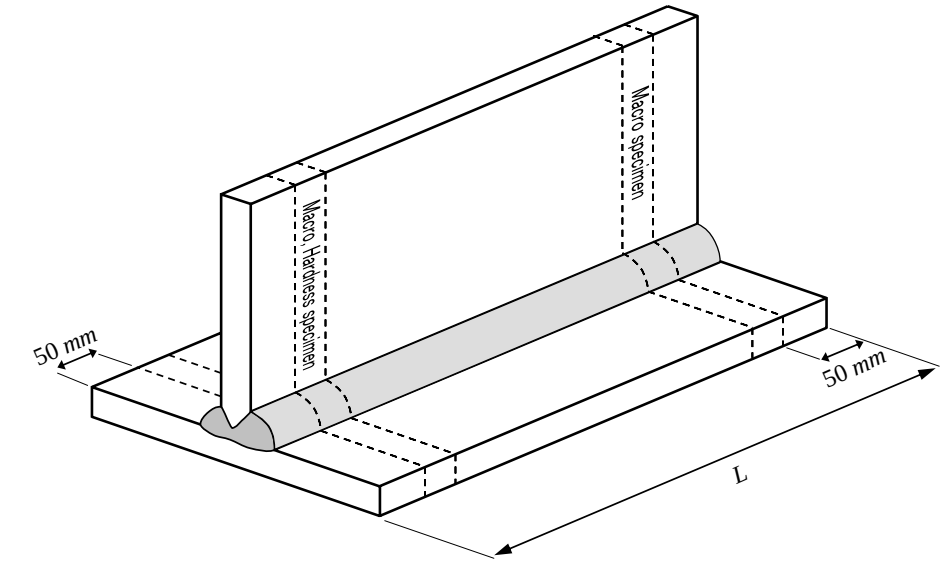
4.4.8 Retests

1 Where visual inspection, macro-structure inspection or non-destructive inspection test fails, the new test specimens welded under the same welding conditions, are to be subject to retest, and all of these test specimens are to pass the test items specified.

2 Where the hardness test fails, the retest may be correspondingly applied to the requirement in **4.2.11-4**.

Fig. M4.8 has been added as follows.

Fig. M4.8 Test Assembly for T-joints with full penetration

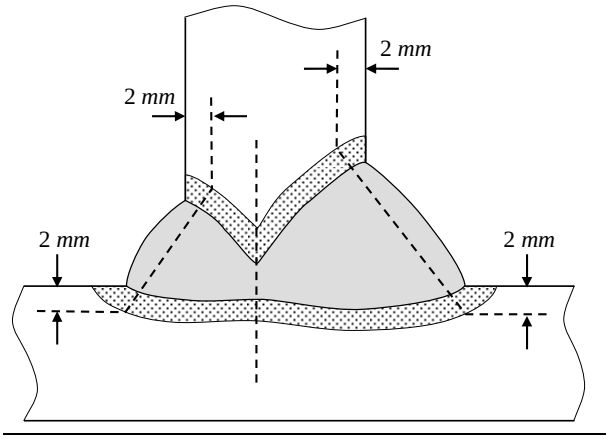


Notes:

(1) The length of test specimen, *L* is not less than 350*mm*.

Fig. M4.9 has been added as follows.

Fig. M4.9 Hardness Test



Notes:

(1) For each row of indentations there is to be a minimum of 3 individual indentations in the world metal, the heat affected zones (both side) and the base metal (both sides).

(2) Measuring intervals are to be 1*mm* on the basis of the bond.

(3) Measuring load is to be 10*kg* Vickers.

EFFECTIVE DATE AND APPLICATION

1. The effective date of the amendments is 1 May 2012.

2. Notwithstanding the amendments to the Rules, the current requirements may apply to welding procedure other than those for which the application for approval is submitted to the Society on or after the effective date.