Amendments to the “Rules for the approval of manufacturers of materials”

Effective from 1/7/2024

List of the amendments:

Part/Chapter/Section/Paragraph amended	Reason
Ch 1, Sec 1, [1.4.1]	to update the requirements for request for approval in line with current testing instructions
Ch 2, Sec 1, [10.2.1], [10.2.2], [11.3.1], [11.3.2], [11.3.3], [11.4.1], [11.6.1]	to introduce IACS UR W31 (Rev.3 - Mar 2023) “YP47 Steels and Brittle Crack Arrest Steels”

SECTION 1 GENERAL REQUIREMENTS FOR APPROVAL

1 General

1.1 Application

1.1.1 These Rules apply to the approval of Manufacturers and associated manufacturing processes of products and equipment which, in accordance with the requirements of Part D of the Rules for the Classification of Ships, are to be produced by approved Manufacturers.

1.2 Abbreviation

1.2.1 "Rules" means the Rules for the Classification of Ships.

1.3 Requirements

1.3.1 In order to be approved the Manufacturer is required to:

a) demonstrate that the works has the necessary manufacturing and testing facilities and qualified personnel to supervise quality control activities

b) carry out approval tests with satisfactory results, according to a specified program agreed with Tasneef.

The condition under a) is deemed satisfied if the Manufacturer has instituted and maintained an approved quality assurance system conforming to ISO 9001 or ISO 9002 standards.

1.4 Request for approval

1.4.1 *(1/7/2024)*

The request for approval is to be submitted ~~directly to the Tasneef's Head Office or through the relevant area~~ to the competent Tasneef branch office.

In addition to the general information required in [1.5.1] as applicable, the specific information required for the various products is to be submitted together with the request for approval.

1.4.2 Where approval is requested for several factories belonging to the same group, a complete set of approval tests is generally carried out in one factory, considered as the main factory, while reduced tests are conducted in the others.

1.5 General information to be submitted for approval

1.5.1 Preliminary general information is to be submitted to Tasneef in connection with the request for approval and is to include, as applicable, particulars relevant to:

a) the name and site address of the Manufacturer, the location of the workshops, the background and size of the works, the estimated total annual production of finished products for ship building construction and for other applications, as deemed useful

b) the organisation and quality:
- organisation chart
- staff employed
- organisation of the quality control department
- qualification of the personnel involved in activities related to the quality of the products
- certification of conformity of quality system to IS0 9001 or 9002, if any

c) the manufacturing facilities
- flow chart of the manufacturing process
- origin and storage of raw materials
- storage of finished products
- equipment for systematic control during fabrication

d) details of inspections and quality control facilities
- details of system used for identification of materials at the different stages of manufacturing
- equipment for mechanical tests, chemical analysis and metallography and relevant calibration procedures
- equipment for non-destructive examinations
- list of quality control procedures

e) approval already granted by other IACS (International Association of Classification Societies) Classification Societies and relevant documentation inclusive of the approval tests performed, if any.

1.6 Approval procedure

1.6.1 Visit to the Manufacturer's plant and tests

On the basis of the information submitted, the approval program is prepared by Tasneef and communicated to the Manu-facturer. Approval programs typical of the various products are indicated in the relevant items of these rules.

A visit to the manufacturing facilities is generally performed by the Tasneef Surveyor beforehand or in connection with the initial testing of the products.

The approval tests are, in general, to be witnessed by a Tasneef Surveyor.

If testing facilities are not available at the works, the tests are to be carried out at recognised laboratories.

1.6.2 Extent of approval tests

The extent of the test program specified in the various items of these rules, may be modified on the basis of preliminary information submitted by the Manufacturer.

SECTION 1 ROLLED STEEL PLATES AND SECTIONS

1 General

1.1 Application

1.1.1 This Section specifies the procedure for the approval of manufacturing processes of plates and sections intended for hull and other structural applications and pressure systems.

In addition to the provisions given in the specific items [2] to [9], the requirements in Ch 1 are also to be complied with as appropriate.

2 Normal and higher strength steel for hull and other structural applications

2.1 Application

2.1.1 Items [2.2] to [2.7] give provisions for the approval of the manufacture of normal and higher strength rolled steel plates and sections for hull and other structural applications.

This procedure also applies to semi-finished products such as slabs, blooms and billets.

2.1.2 Item [2.8] gives a specific confirmation scheme for approval of hull structural steels intended for welding with high heat input over 50 kJ/cm.

2.2 Information to be submitted for approval

2.2.1 The Manufacturer is to submit to Tasneef, together with the request for approval and the general information specified in Ch 1, Sec 1, [1.5.1], particulars relevant to:

a) the types of products (plates, sections, coils), grades of steel, range of thickness and material properties as follows:
   - range of chemical composition including grain refining, micro alloying and residual elements for the various grades of steel; if the range of chemical composition depends on thickness and supply condition, the different ranges are to be specified, as appropriate
   - aim carbon equivalent according to IIW formula
   - aim Pcm content for higher strength grades with low carbon content C < 0,13 %
   - production statistics data of the chemical composition and mechanical properties (R_{eH}, R_m, A% and KV). The statistics are intended to demonstrate the capability to manufacture the steel products in accordance with these rules.

b) Steel making process
   - steel making process and capacity of furnace/s or converter/s
   - raw material used
   - deoxidation and alloying practice
   - desulphurisation and vacuum degassing installations
   - casting methods : ingot or continuous casting. In the case of continuous casting, information is to be provided as appropriate regarding the type of casting machine, teeming practice, methods to prevent re-oxidation, inclusion and segregation control, presence of electromagnetic stirring, criteria for sequential casting in the case of different grades of steels
   - ingot or slab size and weight
   - ingot or slab treatment: scarfing and discarding procedures, hydrogen diffusion processes, if any, sulphur print checks of slabs for quality control purposes, if any

c) Reheating and rolling
   - type of furnace and treatment parameters
   - rolling: reduction ratio of slab/bloom/billet to finished product thickness, rolling and finishing temperatures
   - descaling treatment during rolling
   - capacity of the rolling stands

d) Heat treatment
   - type of furnaces, heat treatment parameters and their associated records
   - accuracy and calibration of temperature control devices

e) Programmed rolling

   For products delivered with normalising rolling (NR) or thermo mechanical rolling (TM) condition, the following additional information is to be given:
   - description of the rolling process
   - normalising temperature, re-crystallisation temperature and Ar3 temperature and the methods to determine them
   - control standards for typical rolling parameters used for the different thicknesses and grades of steel (temperatures and thickness at the beginning and at the end of the passes, interval between passes, reduction ratio, temperature range and cooling speed of accelerated cooling, if any) and relevant methods of control
   - calibration of the control equipment
   - influence on mechanical properties (impact and strength) of heating and flame straightening under conditions representative of the usual working practice
   - transition curve and scattering of impact tests values.

9.5.2 Tasneef will give approval for corrosion resistant steel where approval tests are considered to have given satisfactory results based on the data submitted in accordance with the provisions of this Article [9].

9.5.3 The certificate is to contain the manufacturer's name, the period of validity of the certificate, the grades and thickness of the steel approved, welding methods and welding consumables approved.

9.6 Weldability tests

9.6.1 The results will be assessed by Tasneef in accordance with the acceptance criteria specified in the Appendix of the Annex to Performance Standard for Alternative Means of Corrosion Protection for Cargo Oil Tanks (MSC.289 (87)).

10 YP47 Steels

10.1 Application

10.1.1 *(1/1/2021)*

Provision is made in this Article [10] for the manufacturing approval scheme for YP47 steels of grade EH47.

Unless otherwise specified in this Article, provision in Article [2] is to be followed.

10.2 Approval tests

10.2.1 Extent of the approval tests *(1/7/2024)*

Articles [2.4.1] e) and f) are not applied to manufacturing approval of YP47 steels.

The products for testing are to represent the maximum thickness for approval. If the target chemical composition changes with the thickness, the maximum thickness for each specified chemical composition specification is to be tested.

10.2.2 Type of tests *(1/7/2024)*

In addition to the requirement specified in [10.2.1] and [10.2.2] above, the approval tests required for steels specified in Article [2] are to be carried out. Additional tests may be required when deemed necessary by the Society.

a) Brittle fracture initiation test
   Deep notch test or Crack Tip Opening Displacement (CTOD) test is to be carried out. Test method will be evaluated by the Society on case by case basis.

b) Weldability test
   1) Y-groove weld cracking test (Hydrogen crack test)
      The test method is to be in accordance with recognized national standards such as ~~JIS Z 3158:2016 or CB/T 4364-2013~~ISO 17642-2:2005. Acceptance criteria will be evaluated by the Society on case by case basis.
   2) Brittle fracture initiation test
      Deep notch test or CTOD test is to be carried out. Test method and results are to be considered appropriate by the Society.

c) Other tests

11 Brittle Crack Arrest Steels

11.1 Application

11.1.1 *(1/1/2021)*

Provision is made in this Article [11] for the manufacturing approval scheme for brittle crack arrest steels.

Unless otherwise specified in this Article, provision in Article [2] and/or Article [10] are to be followed.

11.2 Documents to be submitted

11.2.1 *(1/1/2021)*

The manufacturer is to submit to the Society the following documents together with those required in Ch 1, Sec 1, [1.5.1] and Ch 2, Sec 1, [2.2]:

a) In-house test reports of the brittle crack arrest properties of the steels intended for approval

b) Approval test program for the brittle crack arrest properties (see [11.3.1] below)

c) Production test procedure for the brittle crack arrest properties.

11.3 Approval tests

11.3.1 Extent of the approval tests *(1/7/2024)*

The extent of the test program is specified in [11.3.2], [11.3.3] and [11.3.4].

If the manufacturing process and mechanism to ensure the brittle crack arrest properties for the steels intended for approval are same, [2.4.1] is to be followed for the extent of the approval tests. For YP47 steels with brittle crack arrest properties, [2.4.1], e) and f) are not applied.

The products for testing are to represent the maximum thickness for approval. If the target chemical composition changes with the thickness, the maximum thickness for each specified chemical composition specification is to be tested.

The number of test samples and test specimens may be increased when deemed necessary by the Society, based on the in-house test reports of the brittle crack arrest properties of the steels intended for approval specified in [11.2.1] a).

11.3.2 Type of tests *(1/7/2024)*

Brittle crack arrest tests are to be carried out in accordance with [11.3.3] in addition to the approval tests specified in Article [2] and/or Article [10].

In the case of applying for addition of the specified brittle crack arrest properties for YP36, YP40 and YP47 steels of which, manufacturing process has been approved by the Society (i.e. the aim analyses~~,~~ and method of manufacture ~~and condition of supply~~ are similar and the steelmaking process, deoxidation and fine grain practice, casting method and condition of supply are the same), brittle crack

arrest tests, chemical analyses, tensile test and Charpy V-notch impact test are to be carried out in accordance with this Article and Article [2].

11.3.3 Test specimens and testing procedure of brittle crack arrest tests *(1/7/2024)*

The test specimens of the brittle crack arrest tests are to be taken with their longitudinal axis parallel to the final rolling direction of the test plates.

The loading direction of brittle crack tests is to be parallel to the final rolling direction of the test plates.

The thickness of the test specimens of the brittle crack arrest tests is to be the full thickness of the test plates.

The test specimens and repeat test specimens are to be taken from the same steel plate. Where the brittle crack arrest properties are evaluated by K_{ca}, and the brittle crack arrest test result fails to meet the requirement, further brittle crack arrest tests may be carried out. In this case, the judgment of acceptance is to be made on the arrest toughness value K_{ca} of all test specimens (results of the initial test, failed tests and additional tests are to be included in the testing report.).

The thickness of the test specimen is to be the maximum thickness of the steel plate requested for approval.

In the case where the brittle crack arrest properties are evaluated by K_{ca}, the brittle crack arrest test method is to be in accordance with Pt D, Ch 2, App 4, [8] of Tasneef Rules for the Classification of Ships. In the case where the brittle crack arrest properties are evaluated by CAT, the test method is to be in accordance with Pt D, Ch 2, App 54, [9] of Tasneef Rules for the Classification of Ships.

11.3.4 Other tests *(1/1/2021)*

Additional tests may be required when deemed necessary by the Society in addition to the tests specified in [11.3.3].

11.4 Results

11.4.1 *(1/7/2024)*

Article [2.9] is to be followed for the results.

Additionally, results of test items and the procedures are to comply with the test program approved by the Society. In the case where the brittle crack arrest properties are evaluated by K_{ca} or CAT, the manufacturer also is to submit to the Society the brittle crack arrest test reports in accordance with Pt D, Ch 2, App 4, [8] of Tasneef Rules for the Classification of Ships for K_{ca} and Pt D, Ch 2, App 54, [9]

11.5 Approval and Certification

11.5.1 *(1/1/2021)*

Upon satisfactory completion of the survey and tests, approval is granted by the Society with the grade designation having the suffix "BCA1" or "BCA2" (e.g. EH40-BCA1, EH47-BCA1, EH47-BCA2, etc.).

11.6 Renewal of approval

11.6.1 *(1/7/2024)*

The manufacturer is also to submit to the Society actual manufacturing records of the approved brittle crack arrest steels within the term of validity of the manufacturing approval certificate.

Note 1: Chemical composition, mechanical properties, brittle crack arrest properties (e.g. brittle crack arrest test results or small-scale alternative test results) and nominal thickness are to be described in the form of histogram or statistics.