TASNEEF
هيئة الإمـــــارات للتصـــنـيـف
EMIRATES CLASSIFICATION SOCIETY

Amendments to the "Rules for the Classification of Inland Waterway Ships and for Conformity to Directive 2016/1629/EU as amended"

Effective from 1/1/2023

List of the amendments:

Part/Chapter/Section/Paragraph amended	Reason
Pt C, Ch 1, Sec 2, [3.1.1]	to introduce **IACS UR M61** (Rev 1 – Feb 2022) "Starting Arrangements of Internal Combustion Engines"
Pt D, Ch 1, Sec 2, [1.2.1], [2.1.9], [2.2.4], [5.1.1]	to introduce **IACS UR W2** (Rev 3 – Sep 2021) "Test specimens and mechanical testing procedures for materials"
Pt D, Ch 2, Sec 1, [9.9.1]	to introduce **IACS UR W14** (Rev 3 – Sep 2021) "Steel plates and wide flats with specified minimum through thickness properties ("Z" quality)"
Pt D, Ch 3, Sec 2, [2.2.1]	to introduce **IACS UR W25** (Rev 6 – Sep 2021) "Aluminium Alloys for Hull Construction and Marine Structure"
Pt D, Ch 5, Sec 2, [2.5.1]	to introduce **IACS UR W17** (Rev 6 – Sep 2021) "Approval of consumables for welding normal and higher strength hull structural steels"
Pt D, Ch 5, Sec 2, [14.1.1] Pt D, Ch 5, Sec 4, [1.2.1]	to introduce **IACS UR W26** (Rev 2 – Sep 2021) "Requirements for Welding Consumables for Aluminium Alloys"

SECTION 2 DIESEL ENGINES

1 General

1.1 Application

1.1.1 Diesel engines listed below are to be designed, constructed, installed, tested and certified in accordance with the requirements of this Section, under the supervision and to the satisfaction of the Society's Surveyors:

a) main propulsion engines

b) engines driving electrical generators and other auxiliaries essential for safety and navigation and cargo pumps in tankers, when they develop a power of 110 kW and over.

All other engines are to be designed and constructed according to sound marine practice, with the equipment required in [2.3.4], [2.4.2], [2.6.1] [2.6.2], [2.6.5] and [2.6.7] and delivered with the relevant works' certificate (see Pt D, Ch 1, Sec 1, [4.2.3]).

Engines intended for propulsion of lifeboats and compression ignition engines intended for propulsion of rescue boats are to comply with the relevant Rule requirements.

In addition to the requirements of this Section, those given in Sec 1 apply.

1.2 Documentation to be submitted

1.2.1 For each type of engine that is required to be approved according to a) and b) of [1.1.1], the Manufacturer is to submit to the Society the documents listed in Tab 1.

Plans listed under items [2] and [3] in Tab 1 are also to contain details of the lubricating oil sump in order to demonstrate compliance with Sec 1, [2.4].

Where considered necessary, the Society may request the submission of further documents, including details of evidence of existing type approval or proposals for a type testing program in accordance with [4.2] and [4.3].

Where changes are made to an engine type for which the documents listed in Tab 1 have already been examined or approved, the engine Manufacturer is to resubmit to the Society for consideration and approval only those documents concerning the engine parts which have undergone substantial changes.

If the engines are manufactured by a licensee, the licensee is to submit, for each engine type, a list of all the drawings specified in Tab 1, indicating for each drawing the relevant number and revision status from both licensor and licensee.

Where the licensee proposes design modifications to components, the associated documents are to be submitted by the licensee to the Society for approval or for information purposes. In the case of significant modifications, the licensee is to provide the Society with a statement confirming the licensor's acceptance of the changes. In all cases, the licensee is to provide the Surveyor entrusted to carry out the testing, with a complete set of the documents specified in Tab 1.

1.3 Definitions

1.3.1 Engine type

In general, the type of an engine is defined by the following characteristics:

- the cylinder diameter
- the piston stroke
- the method of injection (direct or indirect injection)
- the kind of fuel (liquid, gaseous or dual-fuel)
- the working cycle (4-stroke, 2-stroke)
- the gas exchange (naturally aspirated or supercharged)
- the maximum continuous power per cylinder at the corresponding speed and/or brake mean effective pressure corresponding to the above-mentioned maximum continuous power
- the method of pressure charging (pulsating system or constant pressure system)
- the charging air cooling system (with or without intercooler, number of stages, etc.)
- cylinder arrangement (in-line or V-type).

1.3.2 Engine power

Diesel engines are to be designed such that their rated power running at rated speed can be delivered as a continuous net brake power. Diesel engines are to be capable of continuous operation within power range (1) of Fig 1 and of short-period operation in power range (2). The extent of the power range is to be stated by the engine Manufacturer.

In determining the power of all engines used on board inland waterway ships, the ambient conditions given in [1.3.3] are to be referred to.

Maximum continuous power P is understood to mean the net brake power which an engine is capable of delivering continuously, provided that the maintenance prescribed by the engine Manufacturer is carried out at the maintenance intervals stated by the engine Manufacturer.

To verify that an engine is rated at its continuous power, it is to be demonstrated on the test bed that the engine can run at an overload power corresponding to 110% of its rated power at corresponding speed for an uninterrupted period of 30 minutes.

Subject to the prescribed conditions, diesel engines driving electric generators are to be capable of overload operation even after installation on board.

Subject to the approval of the Society, diesel engines for special vessels and applications may be designed for a blocked continuous power which cannot be exceeded.

2) their total consumer load is applied in steps, provided that:

- the total load is supplied within 45 seconds of power failure on the main switchboard, and
- the maximum step load is declared and demonstrated, and
- the power distribution system is designed such that the declared maximum step loading is not exceeded, and
- compliance of time delays and loading sequence with the above is demonstrated at ship's trials.

f) For alternating current generating sets operating in parallel, the governing characteristics of the prime movers are to be such that, within the limits of 20% and 100% total load, the load on any generating set will not normally differ from its proportionate share of the total load by more than 15% of the rated power in kW of the largest machine or 25% of the rated power in kW of the individual machine in question, whichever is the lesser.

For alternating current generating sets intended to operate in parallel, facilities are to be provided to adjust the governor sufficiently finely to permit an adjustment of load not exceeding 5% of the rated load at normal frequency.

2.6.6 Overspeed protective devices of auxiliary engines driving electric generators

In addition to the speed governor, auxiliary engines of rated power equal to or greater than 220 kW driving electric generators are to be fitted with a separate overspeed protective device, with a means for manual tripping, adjusted so as to prevent the rated speed from being exceeded by more than 15%.

This device is to automatically shut down the engine.

2.6.7 Use of electronic governors

a) Type approval

Electronic governors and their actuators are to be type approved by the Society, according to Pt C, Ch 3, Sec 6 of the Rules for the Classification of Ships.

b) Electronic governors for main propulsion engines

If an electronic governor is fitted to ensure continuous speed control or resumption of control after a fault, an additional separate governor is to be provided unless the engine has a manually operated fuel admission control system suitable for its control.

A fault in the governor system is not to lead to sudden major changes in propulsion power or direction of propeller rotation.

Alarms are to be fitted to indicate faults in the governor system.

The acceptance of electronic governors not in compliance with the above requirements will be considered by the Society on a case by case basis, when fitted on ships with two or more main propulsion engines.

c) Electronic governors for auxiliary engines driving electric generators

In the event of a fault in the electronic governor system the fuel admission is to be set to “zero”.

Alarms are to be fitted to indicate faults in the governor system.

The acceptance of electronic governors fitted on engines driving emergency generators will be considered by the Society on a case by case basis.

3 Arrangement and installation

3.1 Starting arrangements

3.1.1 Mechanical compressed air starting *(1/1/2023)*

a) Main engines which are started with compressed air are to be equipped with at least two starting air compressors. At least one of the air compressors is to be driven independently of the main engine and is to supply at least 50% of the total capacity required. The total capacity of the starting air compressors is to be such that the starting air receivers can be charged to their final pressure within one hour (the receivers being at atmospheric pressure at the start of the charging operation). Normally, compressors of equal capacity are to be installed. If the main engine is started with compressed air, the available starting air is to be divided between at least two starting air receivers of approximately equal size which can be used independently of each other.

b) The total capacity of air receivers is to be sufficient to provide, without replenishment, not less than 12 consecutive starts alternating between ahead and astern of each main engine of the reversible type, and not less than 6 consecutive starts of each main non-reversible type engine connected to a controllable pitch propeller or other device enabling the start without opposite torque.

~~The number of starts refers to the engine in cold and ready to start condition (all the driven equipment that cannot be disconnected is to be taken into account).~~

No special starting air storage capacity needs to be provided for auxiliary engines in addition to the starting air storage capacity specified above. The same applies to pneumatically operated regulating and manoeuvring equipment and to the air requirements of Tyfon units.

Other consumers with a high air consumption may be connected to the starting air system only if the stipulated minimum supply of starting air for the main engines remains assured.

c) The main starting air arrangements for main propulsion or auxiliary diesel engines are to be adequately protected against the effects of backfiring and internal explosion in the starting air pipes. To this end, the following safety devices are to be fitted:

- An isolating non-return valve, or equivalent, at the starting air supply connection to each engine.

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GENERAL TERMS AND CONDITIONS
OF EMIRATES CLASSIFICATION SOCIETY – L.L.C – O.P.C (TASNEEF)
EFFECTIVE AS OF 1 APRIL 2025

DEFINITIONS

Administration	means the government of the state whose flag the Ship is entitled to fly or under whose authority the Ship is authorised to operate in the specific case.
Client	means the interested party and any other party who requires the Services.
Certificate of Classification	means a certificate of classification, issued by a Society and the certificate confirms that the vessel's structure, machinery, and equipment meet the society's specific technical rules and regulations.
Interested Party	means the party, other than the society, having an interest in or responsibility for the Ship, product, plant or system subject to classification or certification (such as the owner of the Ship and his representatives, the Ship builder, the engine builder or the supplier of parts to be tested) who requests the Services or on whose behalf the Services are requested.
Owner	means the registered owner, the Ship owner, the manager or any other party with the responsibility, legally or contractually, to keep the Ship seaworthy or in service, having particular regard to the provisions relating to the maintenance of class laid down in part a, chapter 2 of the rules for the classification of Ships or in the corresponding rules indicated in the specific rules.
Register of Ships	means a register book, also known as a Register of Ships, is a comprehensive record of vessels that are classified by a society.
Rules	means the documents below issued by the Society: a. Rules for the classification of Ships or other special units. b. Complementary rules containing the requirements for certification of products, plants, systems and other or containing the requirements for the assignment of additional class notations. c. Rules for the application of statutory rules, containing the rules to perform the duties delegated by administrations. d. Guides to carry out particular activities connected with Services. e. Any other technical document, as for example rule variations or interpretations.

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Services	means the activities described in Article 1 below, rendered by the Society upon request made by or on behalf of the Interested Party.
Ship	means ships, boats, craft and other special units, as for example offshore structures, floating units and underwater craft.
Society	means Emirates Classification Society LLC OPC and/or its affiliated entities providing the Services.
Surveyor	means technical staff acting on behalf of the society in performing the Services.
UAE	means United Arab Emirates.

ARTICLE 1

1.1 The purpose of the Society is, among others, the classification and certification of Ships and the certification of their parts and components.

1.2 The Society (a) sets forth and develops Rules; (b) publishes the Register of Ships[1]; and (c) issues certificates, statements and reports based on its survey activities.

1.3 The Society also takes part in the implementation of national and international rules and standards as delegated by various Governments.

1.4 The Society carries out technical assistance activities on request and provides special services outside the scope of classification, which is regulated by these general conditions unless expressly excluded in the particular contract.

ARTICLE 2

2.1 The Rules developed by the Society reflect the level of its technical knowledge at the time they are published. Therefore, the Society, though committed, also through its research and development services, to continuous updating, does not guarantee they meet state-of-the-art science and technology at the time of publication or that they meet the Society's or others' subsequent technical developments.

2.2 The Interested Party is required to know the Rules on the basis of which the Services are provided. With particular reference to Classification Services, special attention is to be given to the Rules concerning class suspension, withdrawal and reinstatement. In case of doubt or inaccuracy, the Interested Party is to promptly contact the Society for clarification. The Rules for Classification of Ships are published on the Society's website: www.tasneefmaritime.ae

2.3 The Society exercises due care and skill:

(a) in the selection of its Surveyors; and

(b) in the performance of its Services, taking into account the level of its technical knowledge at the time the

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Services are performed.

2.4 Surveys conducted by the Society include, but are not limited to, visual inspection and non-destructive testing. Unless otherwise required, surveys are conducted through sampling techniques and do not consist of comprehensive verification or monitoring of each component of the Ship or of the items subject to certification. The surveys and checks made by the Society, either on board Ships or with remote techniques, do not necessarily require the constant and continuous presence of the Surveyor. The Society may also commission laboratory testing, underwater inspection and other checks to qualified service suppliers, who will carry out these duties under their responsibility. Survey practices and procedures are selected by the Society based on its experience and knowledge and according to generally accepted technical standards in the sector.

ARTICLE 3

3.1 The class assigned to a Ship, like the reports, statements, certificates or any other document or information issued by the Society, reflect the discretionary opinion of the Society concerning compliance, at the time the Service is provided, of the Ship or product subject to certification, with the applicable Rules (given the intended use and within the relevant time frame).

3.2 The Society is under no obligation to make statements or provide information about elements or facts which are not part of the specific scope of the Service requested by the Interested Party or on its behalf.

3.3 No report, statement, notation on a plan, review, Certificate of Classification, document or information issued or given as part of the Services provided by the Society shall have any legal effect or implication other than a representation that, on the basis of the checks made by the Society, the Ship, structure, materials, equipment, machinery or any other item covered by such document or information meet the Rules. Any such document is issued solely for the use of the Society, its committees and clients or other duly authorised bodies and for no other purpose. Therefore, the Society cannot be held liable for any act made or document issued by other parties on the basis of the statements or information given by the Society. The validity, application, meaning and interpretation of a Certificate of Classification, or any other document or information issued by the Society in connection with its Services, are governed by the Rules of the Society, whom is the sole subject entitled to make such authentic interpretation. Any disagreement on technical matters between the Interested Party and the Surveyor in the carrying out of his functions shall be raised in writing as soon as possible with the Society, which will settle any divergence of opinion or dispute.

3.4 The classification of a Ship, or the issuance of a certificate or other document connected with classification or certification and in general with the performance of Services by the Society shall have the validity conferred upon it by the Rules of the Society at the time of the assignment of class or issuance of the certificate; in no case shall it amount to a statement or warranty of seaworthiness, structural integrity, quality or fitness for a particular purpose or service of any Ship, structure, material, equipment or machinery inspected or tested by the Society.

3.5 Any document issued by the Society in relation to its activities reflects the condition of the Ship or the subject of certification or other activity at the time of the check.

3.6 The Rules, surveys and activities performed by the Society, reports, certificates and other documents issued by

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the Society are in no way intended to replace the duties and responsibilities of other parties including, without limitation, Governments, designers, ship builders, manufacturers, repairers, suppliers, contractors or sub-contractors, Owners, operators, charterers, underwriters, sellers or intended buyers of a Ship or other product or system surveyed.

3.7 These documents and activities do not relieve such parties from any fulfilment, warranty, responsibility, duty or obligation (also of a contractual nature) expressed or implied or in any case incumbent on them, nor do they confer on such parties any right, claim or cause of action against the Society. With particular regard to the duties of the Owner, the Services undertaken by the Society do not relieve the Owner of his duty to ensure proper maintenance of the Ship and ensure seaworthiness at all times. Likewise, the Rules, surveys performed, reports, certificates and other documents issued by the Society are intended neither to guarantee the buyers of the Ship, its components or any other surveyed or certified item, nor to relieve the seller of the duties arising out of the law or the contract, regarding the quality, commercial value or characteristics of the item which is the subject of transaction.

3.8 In no case, therefore, shall the Society assume the obligations incumbent upon the above-mentioned parties, even when it is consulted in connection with matters not covered by its Rules or other documents.

3.9 In consideration of the above, and within the limits of liability under Article 5 below, the Interested Party undertakes to relieve and hold harmless the Society from any third party claim, as well as from any liability in relation to the latter concerning the Services rendered, where these are attributable to the Interested Party.

3.10 Insofar as they are not expressly provided for in these General Conditions, the duties and responsibilities of the Owner and Interested Parties with respect to the Services rendered by the Society are described in the Rules applicable to the specific Service rendered.

ARTICLE 4

4.1 Any request for the Society's Services shall be submitted in writing and signed by or on behalf of the Interested Party. Such a request will be considered irrevocable as soon as received by the Society and shall entail acceptance by the applicant of all relevant requirements of the Rules, including these General Conditions. Upon acceptance of the written request by the Society, a contract between the Society and the Interested Party is entered into, which is regulated by the present General Conditions.

4.2 In consideration of the Services rendered by the Society, the Interested Party and the person requesting the service shall be jointly liable for the payment of the relevant fees and costs, even if the service is not concluded for any cause not pertaining to the Society. In the latter case, the Society shall not be held liable for non-fulfilment or partial fulfilment of the Services requested. In the event of non-payment of the invoice within the contractually agreed terms, the Society reserves the right to request, in addition to the full payment of the principal amount due and without the need for further formal notice, also:

(a) Late payment interest at a rate of 5% per annum, calculated from the due date of the invoice until full payment is received, in accordance with the applicable laws in the United Arab Emirates or the country from where the invoice is issued. Any applicable VAT, taxes, or statutory levies shall be borne by the Client as per the laws

of the respective jurisdiction;

(b) full reimbursement of any costs incurred for debt recovery, including, but not limited to, legal fees, administrative expenses, and the costs of any extrajudicial actions; and

(c) any additional amount due as compensation for damages suffered as a result of the delay or non-compliance, where documented.

4.3 The contract for the classification of a Ship or for other Services may be terminated and any certificates revoked at the request of one of the parties, subject to at least 30 days' notice to be given in writing. Failure to pay, even in part, the fees due for Services carried out by the Society will entitle the Society to immediately terminate the contract and suspend the Services.

4.4 The Society may withhold, suspend or withdraw any certificate, report or service in the event of non-payment of fees due to any member of the Society by the Client in relation to the entire business relationship between any member of the Society and the Client or by any other companies belonging to the same group as the Client. This also applies when the obligation to pay rests with a builder or with the Ship's previous Owner.

4.5 For every case of termination or suspension of the contract, the fees for the activities performed until the time of the termination or of the suspension shall be owed to the Society as well as the expenses incurred in view of activities already programmed; this is without prejudice to the right to compensation due to the Society as a consequence of the termination or of the suspension.

4.6 With particular reference to Ship classification and certification, unless decided otherwise by the Society, termination of the contract implies that the assignment of class to a Ship is withheld or, if already assigned, that it is suspended or withdrawn; any statutory certificates issued by the Society will be withdrawn in those cases where provided for by agreements between the Society and the flag State.

ARTICLE 5

5.1 In providing the Services, as well as other correlated information or advice, the Society, its Surveyors, servants or agents operate with due diligence for the proper execution of the activity. However, considering the nature of the activities performed (see Article 2), it is not possible to guarantee absolute accuracy, correctness and completeness of any information or advice supplied. Express and implied warranties are specifically disclaimed.

5.2 Therefore, subject to what provided for in Article 5.3 below, and also in the case of activities carried out by delegation of Governments, neither the Society nor any of its Surveyors will be liable for any loss, damage or expense of whatever nature sustained by any person, in tort or in contract, derived from carrying out the Services.

5.3 Notwithstanding the provisions in Article 5.1 above, should any user of the Society's Services prove that he has suffered a loss or damage due to any negligent act or omission of the Society, its Surveyors, servants or agents, then the Society will pay compensation to such person for his proved loss, up to, but not exceeding, five times the amount of the fees charged for the specific Services, information or opinions from which the loss or damage derives or, if no fee has been charged, a maximum of AED5,000 (Arab Emirates Dirhams Five Thousand only).

5.4 Where the fees charged are related to a number of Services, the amount of the fees will be apportioned for the purpose of the calculation of the maximum compensation, by reference to the estimated time involved in the

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performance of the Service from which the damage or loss derives. Any liability for indirect or consequential loss, damage or expense is specifically excluded. In any case, irrespective of the amount of the fees charged, the maximum damages payable by the Society will not be more than AED 300,000 (Three Hundred Thousand Dirhams). Payment of compensation under this Article will not entail any admission of responsibility and/or liability by the Society and will be made without prejudice to the disclaimer clause contained in Article 5.

5.5 Any claim for loss or damage of whatever nature by virtue of the provisions set forth herein shall be made to the Society in writing, within the shorter of the following periods: THREE MONTHS from the date on which the Services were performed or THREE MONTHS from the date on which the damage was discovered. Failure to comply with the above deadline will constitute an absolute bar to the pursuit of such a claim against the Society.

ARTICLE 6

6.1 Any dispute, controversy, or claim arising out of or relating to these Rules, the Services of the Society, or the interpretation, breach, or termination thereof, shall first be referred to the parties' senior management for amicable resolution within thirty (30) days of written notice by either party.

6.2 If the dispute is not resolved amicably under Article 6.1, it shall be exclusively governed by and construed in accordance with the laws of the Emirate of Abu Dhabi and the applicable federal laws of the United Arab Emirates. The courts of Abu Dhabi shall have exclusive jurisdiction to settle any such dispute.

ARTICLE 7

7.1 All plans, specifications, documents and information provided by, issued by, or made known to the Society, in connection with the performance of its Services, will be treated as confidential and will not be made available to any other party other than the Owner without authorisation of the Interested Party, except as provided for or required by any applicable legislation from a competent authority. Information about the status and validity of class and statutory certificates, including transfers, changes, suspensions, withdrawals of class, conditions of class, operating conditions or restrictions issued against classed ships and other related information, as may be required, may be published on the website or released by other means, without the prior consent of the Interested Party.

7.2 Information about the status and validity of other certificates and statements may also be published on the website or released by other means, without the prior consent of the Interested Party.

7.3 Notwithstanding the general duty of confidentiality owed by the Society to its clients in Article 7.1 above, the Society's clients hereby accept that the Society will participate in the IACS Early Warning System which requires each Classification Society to provide other involved Classification Societies with relevant technical information on serious hull structural and engineering systems failures, as defined in the IACS Early Warning System (but not including any drawings relating to the Ship which may be the specific property of another party), to enable such useful information to be shared and used to facilitate the proper working of the IACS Early Warning System. The Society will provide its clients with written details of such information sent to the involved Classification Societies.

7.4 In the event of transfer of class, addition of a second class or withdrawal from a double/dual class, the Interested Party undertakes to provide or to permit the Society to provide the other Classification Society with all building plans and drawings, certificates, documents and information relevant to the classed unit, including its history file,

as the other Classification Society may require for the purpose of classification in compliance with the applicable legislation and relative IACS Procedure. It is the Owner's duty to ensure that, whenever required, the consent of the builder is obtained with regard to the provision of plans and drawings to the new Society, either by way of appropriate stipulation in the building contract or by other agreement.

7.5 In the event that the ownership of the Ship, product or system subject to certification is transferred to a new subject, the latter shall have the right to access all pertinent drawings, specifications, documents or information issued by the Society or which have come to the knowledge of the Society while carrying out its Services, even if related to a period prior to transfer of ownership.

ARTICLE 8

8.1 The Society shall not be obliged to perform any obligation towards the Client (including, without limitation, obligation to (a) perform, deliver, accept, sell, purchase, pay or receive money to, from or through a person or entity, or (b) engage in any other act) if this would be in violation of, inconsistent with or expose the Society to punitive measures under any United Nations resolutions and/or under any laws, regulations, decrees, ordinances, orders, demands, requests, rules or requirements of EU, United Kingdom, and/or United States of America and which relate to foreign trade controls, export controls, embargoes or international boycotts (applying, without limitation, to the financing, payment, insurance, transportation, delivery or storage of product and/or services) hereinafter referred to as "Trade Sanctions".

8.2 Recurring the above circumstances during the performance of the contract, the Society shall be entitled at its sole and absolute discretion:

(a) to immediately suspend payment or performance of the Services which are the object of the contract until such;

(b) time as the Trading Sanctions are in force;

(c) to a full disengagement from the obligation affected by the Trading Sanctions, in the event that the inability to fulfill the said obligation persists until the term provided for the fulfilment hereunder, provided that where the relevant obligation relates to payments for activities and/or Services which have already been delivered, the affected payment obligation shall remain only suspended until such time as the Trading Sanctions no longer apply to the payment ; and/or

(d) to terminate the contract, without prejudice of the Society's rights pursuant to Article 4.

ARTICLE 9

Should any part of these General Conditions be declared invalid, this will not affect the validity of the remaining provisions.

ARTICLE 10

When the Society provides its Services to a consumer - i.e. a natural person who does not act within the scope of his business or professional activity - the following provisions do not apply Article 3 (as far as the Society is solely entitled to the authentic interpretation of the Rules); Article 4, (as far as the payment of the fees is also due for Services not

concluded due to causes not attributable to the Interested Party); Article 5 (as far as the exclusion of liability is concerned), and Article 6 (as far as the jurisdiction of a Board of Arbitrators based in Abu Dhabi is concerned).

ARTICLE 11

11.1 The Society and the Interested Party shall promote safety, protect human health and environment and create safe working conditions for their personnel.

11.2 The Interested Party shall guarantee that the working environment in which the Society's Surveyor will be required to work is adequate, safe and in all respect compliant with the applicable legislation and Rules and shall adopt all necessary measures to mitigate and/or control any relevant risk.

11.3 Furthermore, in accordance with the applicable legislation and Rules, the Interested Party shall provide the Society with complete and detailed information relevant to any actual or potential specific risk existing in the work areas where the Surveyor will be required to operate and relevant to the performance of the Services as well as with any specific safety measure that the Society's Surveyor is requested to comply with.

11.4 The Society reserves not to commence and/or to suspend the Services and/or to terminate the contract, claiming compensation for any damage occurred, if it considers that the safety requirements listed in this Article are not satisfactorily met.

cladding is at least equal to its guaranteed nominal thickness.

8.10.3 In cases where, after grinding, the cladding thickness is less than the guaranteed nominal thickness, the repair is carried out by welding. The filler metal is to be of the same grade as the cladding and the repair procedure is to be defined in agreement with the Surveyor and preliminarily approved.

8.10.4 If, after grinding of the defect, the remaining thickness of the cladding is less than half of the guaranteed nominal thickness, it is necessary to replace the cladding by tapering and to rebuild the whole of the cladding by welding. Such delicate repair is to be carried out in agreement with the Surveyor and preliminarily approved.

8.11 Adhesion defects in the cladding and repairs

8.11.1 In the case of adhesion defects detected by an ultrasonic inspection as defined in [8.9], the areas of non-adhesion of the cladding which exceed the limits specified in [8.9.4] are to be removed by cutting off or to be repaired.

9 Steels with specified through thickness properties

9.1 Application

9.1.1 The requirements of this Article apply to steel plates and wide flats having thickness not less than 15mm, where improved through thickness ductility in the direction of thickness is required (see [1.1.3]).

The extension to lower thicnesses and relevant conditions are at the discretion of TASNEEF.

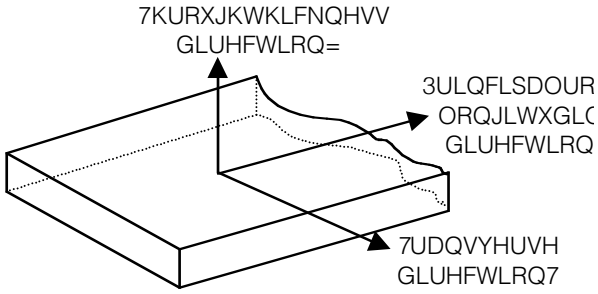
9.2 Steel grades

9.2.1 The requirements of Article [9] are intended as a supplement to the requirements of Articles [2], [3], [4], [5], [6] and [7] which specify the quality of steels for hull structures, boilers, pressure vessels, low temperature applications and machinery and are intended to have specified minimum ductility in the through thickness or "Z" direction (see Fig 6).

9.2.2 The Z designation is to be given to any steel grade which has been tested according to the above mentioned specifications, and has been successfully subjected to the tests defined in [9.6] and [9.8].

9.2.3 Two "Z" quality steels are specified, Z25 for normal ship applications and Z35 for more severe applications.

Figure 6 : Normal test specimen



9.3 Manufacture

9.3.1 Approval

Z grade steel Manufacturers are to be approved by TASNEEF for the specific "Z" quality.

The conditions for approval are indicated in the “Rules for the approval of Manufacturers of materials”.

The procedure has to take into account the improved steelmaking techniques of calcium treatment, vacuum degassing and argon stirring as well as the control of centre-line segregation during continuous casting.

9.4 Chemical composition

9.4.1 In addition to the requirements of the appropriate steel specification, the maximum sulphur content is to be 0,008% determined by the ladle analysis.

9.5 Mechanical properties

9.5.1 The ductility in the direction of thickness is evaluated, for the purpose of these requirements with the value of the reduction area measured on tensile test specimens taken in the through thickness direction of the product and prepared as specified in [9.6.4].

9.6 Test Procedure

9.6.1 General

In addition to the requirements of the appropriate steel specification, preparation of specimens and testing procedures are to be as indicated in the following items [9.6.2] to [9.7.1].

9.6.2 Test sampling

For plates and wide flats, one test sample is to be taken close to the longitudinal centreline of one end of each rolled piece representing the batch and where applicable preferably at the end corresponding to the top of the ingots. See Tab 27 and Fig 7.

9.6.3 Number of tensile test specimens

The test sample must be large enough to accommodate the preparation of 6 specimens. 3 test specimens are to be prepared while the rest of the sample remains for possible retest.

9.6.4 Tensile test specimen dimensions

Round test specimens including the type built-up by welding are to be prepared in accordance with ISO 6892-98, EN 10164-93 or another recognised standard.

Table 27 : Batch size dependent on product and sulphur content

Product	S > 0,005%	S ≤ 0,005%
Plates	Each piece (parent plate)	Maximum 50t of products of the same cast, thickness and heat treatment
Wide flats of nominal thickness ≤ 25mm	Maximum 10t of products of the same cast, thickness and heat treatment	Maximum 50t of products of the same cast, thickness and heat treatment
Wide flats of nominal thickness > 25mm	Maximum 20t of products of the same cast, thickness and heat treatment	Maximum 50t of products of the same cast, thickness and heat treatment

9.7 Tensile test results

9.7.1 The test is considered invalid and a further replacement test is required if the fracture occurs in the weld or heat affected zone.

The minimum average value for the reduction of area of at least 3 tensile test specimens taken in the through thickness direction is to be that shown for the appropriate grade given in Tab 28. Only one individual value may be below the minimum average but not less than the minimum individual value shown for the appropriate grade (see Fig 8).

A value less than the minimum individual value is a cause for rejection.

9.8 Re-test procedure

9.8.1 Fig 8 shows the three cases where a re-test situation is permitted. In these instances three more tensile tests are to be taken from the remaining test sample. The average of all 6 tensile tests is to be greater than the required minimum average with no greater than two results below the minimum average.

In the case of failure after re-test, either the batch represented by the piece is rejected or each piece within the batch is required to be tested.

Table 28 : Reduction of area acceptance values

Grade	Z25	Z35
Minimum average	25%	35%
Minimum individual	15%	25%

9.9 Ultrasonic testing

9.9.1 *(1/1/2023)*

Ultrasonic testing is required and is to be performed in accordance with either EN 10160:1999 Level S1/E1 or ASTM A 578:2017 Level C.

Ultrasonic testing should be carried out on each piece in the final supply condition and with a probe frequency of 4MHz.

9.10 Marking

9.10.1 Products complying with these requirements are to be marked in accordance with the appropriate steel requirement and in addition with the notation Z25 or Z35 added to the material grade designation, e.g. EH36Z25 or EH36Z35.

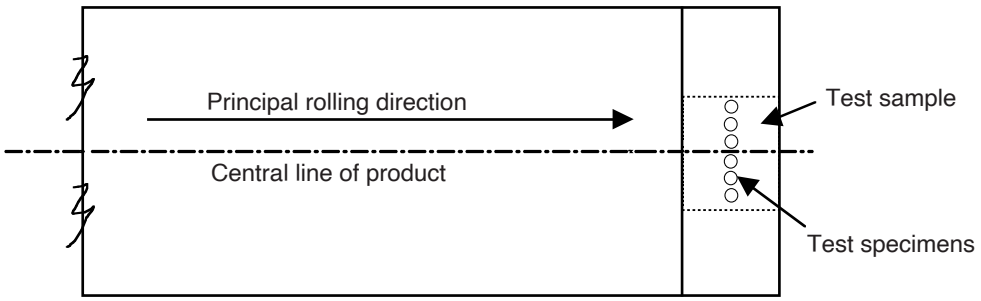
9.11 Certification

9.11.1 The following information is required to be included on the certificate in addition to the appropriate steel requirement:

a) through thickness reduction in area (%)

b) steel grade with Z25 or Z35 notation.

Figure 7 : Plate and wide flat sampling position



SECTION 2 ALUMINIUM ALLOYS

1 General

1.1 Application

1.1.1 General

The requirements of this Section apply to wrought aluminium alloys, rivets, transition joints and cast aluminium alloys.

1.1.2 Other standards

Alloys and tempers other than those defined in Articles [2], [3], [4] and [5], and which comply with national or international standards or proprietary specifications deemed equivalent to these requirements, may be accepted with the agreement of TASNEEF.

1.1.3 Weldability

Except for rivets, aluminium products in accordance with these Rules are weldable using suitable welding processes and, where appropriate, subject to any conditions stated at the time of approval.

1.2 Manufacture

1.2.1 Manufacturing process

Manufacturing processes and heat treatments suitable to obtain products having the specified quality and properties are, in principle, left to the discretion of the Manufacturer.

Heat treatment is to be carried out in suitable furnaces fitted with the necessary equipment, in accordance with appropriate procedures, to the satisfaction of the Surveyor.

1.2.2 Approval

The manufacturing and treatment processes and the control systems are to be approved by TASNEEF for individual Manufacturers. To this end, detailed information is to be submitted to TASNEEF and, as a rule, checks and tests are required depending on the importance of the product and its intended use.

1.2.3 Quality of material

All products are to have a workmanlike finish and be free from defects, surface or internal imperfections, segregation and non-metallic inclusions which may impair their proper workability and use.

1.2.4 Identification

The Manufacturer is to adopt a system of identification which will ensure that all finished material in a batch presented for testing is of the same nominal chemical composition.

1.2.5 Marking

Products are to be clearly marked by the Manufacturer in accordance with the requirements of Chapter 1.

The following details are to be shown on all materials which have been accepted:

- Manufacturer's mark
- grade of alloy and temper conditions
- number of the manufacturing batch enabling the manufacturing process to be traced
- Classification Society's brand.

When extruded products are bundled together or packed in crates for delivery, the marking is to be affixed by a securely fastened tag or label.

1.2.6 Certification and documentation

Each test certificate or shipping statement is to include the following particulars:

- purchaser's name and order number
- description and dimensions
- specification or grade of alloy
- details of heat treatment, where applicable
- identification mark which will enable the full history of the item to be traced
- chemical composition
- mechanical test results (not required on shipping statement).

Where the alloy is not produced at the works at which it is wrought, a certificate is to be supplied by the Manufacturer of the alloy stating the cast number and chemical composition. The works at which the alloy was produced is to be approved by TASNEEF.

2 Wrought aluminium alloy products (plates, bars, sections and tubes)

2.1 Application

2.1.1 *(1/1/2022)*

The requirements of this Article apply to wrought aluminium alloys used in the construction of hulls and other inland water structures, and for cryogenic applications.

2.1.2 These requirements are applicable to wrought aluminium products within a thickness range between 3 mm and 50 mm inclusive.

2.1.3 The application of these provisions to aluminium alloy products outside this thickness range requires the prior agreement of TASNEEF.

The general requirements specified in Article [1] are also to be complied with, as appropriate.

2.1.4 In the case of ships carrying liquefied gas in bulk, the International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk also applies.

Materials intended for the construction of cargo tanks or storage tanks for liquefied gases and for other low temperature applications are to be manufactured in 5083 alloy in the annealed condition.

2.2 Aluminium grades

2.2.1 Designation *(1/1/2023)*

The numerical designation (grade) of aluminium alloys and their temper designation are in accordance with the "Registration Record of International Alloy Designation".

Temper conditions (delivery heat treatment) are defined in EN 515:2017 or ANSI H35.1:2017.

2.2.2 Rolled products (sheets, strips and plates)

The following aluminium alloys are covered by these requirements:

- 5083
- 5059
- 5086
- 5383
- 5456
- 5754

with the following temper conditions:

- O/H111/H112
- H116
- H321

2.2.3 Extruded products (sections, shapes, bars and closed profiles) *(1/1/2022)*

The following aluminium alloys are covered by these requirements:

- 5083
- 5059
- 5086
- 5383

with the following temper conditions:

- O/H111/H112

and

- 6005A
- 6061
- 6082

with the following temper conditions:

- T5 or T6

2.3 Manufacture

2.3.1 Approval

All materials, including semi-finished products, are to be manufactured at works which are approved by TASNEEF for the grades of aluminium alloy supplied ([1.2.2]).

Plates are to be formed by rolling and may be hot or cold finished.

Bars and sections may be formed by extrusion, rolling or drawing.

2.3.2 Quality of materials

It is the producer's responsibility to check the quality of the materials as well as conformity with dimensional tolerances.

2.3.3 Repairs

Slight surface imperfections may be removed by grinding or machining provided the thickness of the material remains everywhere within acceptable tolerances.

The repair of defects by welding is not accepted.

2.3.4 Dimensional tolerances

The under thickness tolerances for rolled products given in Tab 1 are minimum requirements.

The underthickness tolerances for extruded products are to be in accordance with the requirements of recognised international or national standards.

Dimensional tolerances other than under thickness tolerances are to comply with a recognised national or international standard.

2.3.5 Non-destructive examination

In general, the non-destructive examination of material is not required for acceptance purposes.

Table 1 : Under thickness tolerances for rolled products

Nominal thickness (mm)	Thickness tolerances for nominal width (mm)		
	up to 1500	from 1500 to 2000	from 2000 to 3500
from 3 to 4	0,10	0,15	0,15
from 4 to 8	0,20	0,20	0,25
from 8 to 12	0,25	0,25	0,25
from 12 to 20	0,35	0,40	0,50
from 20 to 50	0,45	0,50	0,65

SECTION 2 APPROVAL OF WELDING CONSUMABLES

1 General

1.1 Application

1.1.1 The requirements of this Section apply to the approval and periodical control tests of consumables for welding carbon and carbon manganese steels, high strength quenched and tempered steels, chromium and chromium-molybdenum steels, nickel steels for low temperature applications, austenitic and austenitic-ferritic stainless steels, and aluminium alloys.

This Article specifies the requirements common to all the above-mentioned welding consumables, while the appropriate specific requirements are indicated in Articles [2] to [14].

The following categories of welding consumables are considered:

- covered electrodes for manual and gravity welding
- wire/flux combinations for submerged arc welding
- solid wire/gas combinations for continuous wire arc welding
- flux cored wires for continuous wire arc welding with or without shielding gas
- consumables for electrogas and electroslag welding.

1.2 Grading and designation

1.2.1 General

Consumables are classified depending on the mechanical and chemical properties of the filler metal; different grades or type of consumables may be considered for specific applications or materials on a case-by-case basis.

1.2.2 Consumables for C and C-Mn steels and for Q-T steels

Welding consumables intended for welding C and C-Mn steels are divided into groups related to the strength level (minimum specified yield strength) of the steel; each group is subdivided into grades depending on the impact test temperatures, as indicated in Tab 1.

1.2.3 Consumables for Mo and Cr- Mo steels

Consumables intended for welding Mo and Cr-Mo steels are designated by a symbol indicating the nominal Mo and Cr percentage content of the deposited weld metal, as follows:

a) M for Mo = 0,5

b) C1M for Cr =1,25 and Mo = 0,5

c) C2M1 for Cr = 2,25 and Mo = 1

1.2.4 Consumables for Ni steels for low temperature applications

Consumables intended for welding nickel steels are designated by a symbol indicating the type of nickel steel for which the consumables are intended, as follows:

a) N15 for steels with Ni = 1,30 - 1,70 (%)

b) N35 for steels with Ni = 3,25 - 3,75 (%)

c) N50 for steels with Ni = 4,75 - 5,25 (%)

d) N90 for steels with Ni = 8,50 - 10 (%)

1.2.5 Consumables for austenitic and austenitic-ferritic (duplex) stainless steels

Consumables intended for welding austenitic steels are designated by a symbol corresponding to the AWS designation of the weld deposit, as follows: 308, 308L, 316, 316L, 316LN, 317, 317L, 309L, 309, 309Mo, 310, 310Mo, 347.

Consumables intended for welding austenitic-ferritic steels are designated by a symbol indicating the nominal percentage content of Cr and Ni in the deposited metal (e.g. 2205 means 22% Cr and 5% Ni).

Table 1 : Consumable grades for C-Mn steels

Steel strength level	Consumable grades based on impact test temperature at (°C)				
	+ 20	0	-20	-40	-60
Normal strength	1	2	3	4	-
Higher strength steels **(1)** - ≥ 315, < 360 N/mm² - ≥ 360, < 400 N/mm²	1Y **(2)**	2Y 2Y40	3Y 3Y40	4Y 4Y40	5Y 5Y40
High strength quenched and tempered steels **(1)**			3Y42-46-50-55-62-69	4Y42-46-50-55-62-69	5Y42-46-50-55-62-69

(1) The symbol Y, which indicates the high strength steel groups is followed, for steels having the minimum specified yield strength equal to or higher than 355N/mm², by a number related to the minimum specified yield strength value of the weld metal (e.g. 42 for a minimum yield strength of 420 N/mm²).

(2) Grade not applicable to covered electrodes.

that each layer should be deposited in a direction perpendicular to the previous one.

The current adopted for welding the test samples is to be within the range recommended by the Manufacturer; in the case of electrodes for use both with a.c. and d.c. current, the welding is to be carried out with alternating current.

After each layer has been deposited, the pad may be cooled to room temperature by immersion in water for 30 seconds.

The surface of each layer is to be free from slag inclusions and blow holes.

1.6.3 After the welding is completed, the top surface of the pad is to be removed by mechanical means and discarded.

Shavings sufficient for checking the chemical composition are then to be taken in such a manner that no metal is removed closer to the surface of the base plate than the distance indicated in Tab 3.

Table 3 : Sampling method

Diameter of tested electrode (mm)	Minimum distance from the base plate for taking out the shavings (mm)
2,5	6
3,25 - max.	8

1.7 Re-test procedures

1.7.1 General

When for one or more test samples the execution of the weld, the external examination, the radiographic examination or the fracture produce results which are not considered satisfactory in some respects, and when the respective causes may be traced back to the operator or operating conditions, the test samples may be allowed to be repeated, in duplicate if deemed necessary, with the same procedure. In other cases, as well as when cracks are detected, the consumable will not be approved.

The operating conditions for the re-test samples are to be agreed with the Surveyor, as deemed appropriate.

For the approval of the consumable, or for the continuation of the testing program, the re-test samples are to produce satisfactory results.

1.7.2 Tensile and bend tests

Where the result of a tensile or bend test does not comply with the requirements, duplicate test specimens of the same type are to be prepared from the same sample and satisfactorily tested. Where insufficient original welded assembly is available, a new assembly is to be prepared using welding consumables of the same batch. If the new assembly is made with the same procedure (in particular the same number of runs) as the original assembly, only the duplicate re-test specimens need to be prepared and tested. Otherwise, all test specimens are to be prepared for re-testing.

1.7.3 Charpy V-notch impact test

For re-test procedures, reference is to be made to Ch 1, Sec 1, [3.5].

Further re-tests may be carried out at the Surveyor's discretion, but these are to be performed on a new welded assembly and are to include all the tests required for the original assembly, including those which were previously satisfactory.

2 Covered electrodes for manual metal arc welding of C and C-Mn steels

2.1 Application

2.1.1 General

The requirements of this Article apply to covered electrodes for manual metal arc welding of hull structural steels, of the corresponding grades of steel forgings and castings and of comparable steels intended for other structural applications or pressure systems.

2.1.2 Grading

Electrodes are divided, for the various strength levels, into the following grades:

a) 1, 2, 3, 4 for normal strength steels

b) 2Y, 3Y, 4Y, 5Y for high strength steels with specified minimum yield strength up to 355 N/mm^2

c) 2Y40, 3Y40, 4Y40, 5Y40 for high strength steels with specified minimum yield strength up to 390 N/mm^2.

Depending on the hydrogen content of the weld metal, the symbol H15 or H, H10 or HH, H5 is added to the grade mark as in [1.2.7].

The symbols H15, H10, H5 indicate the hydrogen content determined with the mercury method.

2.1.3 Information and documentation to be submitted

The following information and supporting documentation, as appropriate, are generally to be submitted together with the request for approval:

a) trade name of the electrode

b) range of diameters and other significant dimensions

c) type of covering

d) grades for which the application is made, including additional symbols

e) typical chemical composition of the deposited metal

f) weld metal recovery (efficiency) according to ISO 2401

g) welding technique and type of current

h) proposed range of application and operating characteristics

i) marking and packing

j) Manufacturer's workshop, manufacturing facilities, manufacturing and treatment cycles, methods and procedures of Manufacturer's quality controls

k) instructions for use

l) previous approvals granted to the electrodes with the necessary references.

Table 7 : Mechanical properties

Grade	Longitudinal tensile test on deposited metal			Tensile test on butt weld	Charpy V-notch impact test Minimum average energy (J)		
	Yield stress R_{eH} (N/mm^2) min.	Tensile strength R_m (N/mm^2)	Elong A_5 (%) min.	Tensile strength R_m (N/mm^2) min.	Test temp. (C°)	Flat, Horizontal, Overhead	Vertical
1	305	400 - 560	22	400	+ 20	47	34
2					0		
3					- 20		
4					- 40		
2Y	375	490 - 660	22	490	0	47	34
3Y					- 20		
4Y					- 40		
5Y					- 60		
2Y40	400	510 - 690	22	510	0	47	39
3Y40					- 20		
4Y40					- 40		
5Y40					- 60		41

2.4.4 Test requirements

The required results of tensile and impact tests on deposited metal and butt weld tests are indicated in Tab 7.

Bend tests are to be performed on a mandrel having a diameter equal to three times the thickness of the specimen; the results are to comply with requirements in [1.5.3].

2.4.5 Approval in the stress relieved condition

When the approval of the electrode is required with the additional symbol D, relevant to the checking of the mechanical properties in the stress relieved condition, the following additional tests are to be performed on samples submitted to stress relieving in the furnace for 1 hour at 600-650°C:

- one longitudinal tensile test and 3 Charpy V-notch impact tests on the deposited metal test assembly welded with the maximum diameter to be approved
- alternatively or in addition, at the Surveyor's discretion, 3 Charpy V-notch impact tests on the butt weld test welded in flat and vertical position.

The impact tests are to be carried out at the temperature specified for the respective grades of electrodes.

2.5 Tests for checking the hydrogen content

2.5.1 General *(1/1/2023)*

When electrodes are to be approved with symbol H or H15, HH or H10, ~~-~~H5, tests are to be carried out to ~~-~~determine the hydrogen content of the weld metal.

Low hydrogen electrodes are to subjected to a hydrogen test.

The hydrogen content is to be checked with the mercury method according to standard ISO ~~standard~~ 3690~~-~~1977:2018 or another comparable method with TASNEEF's consent. The use of the glycerine method described in [2.5.2] may be admitted by TASNEEF for symbols H and HH.

For the assignment of the designation HHH, the hydrogen content is, in any case, to be checked with the mercury method according to the above ISO standard.

2.5.2 Glycerine method

Four test samples are to be prepared measuring 12 x 25 mm^2 in cross-section by about 125 mm in length. The parent metal may be any grade of structural steel and, before welding, the samples are to be weighed to the nearest 0,1 gram. On the 25 mm width surface of each specimen, a single bead of welding is to be deposited by a 4 mm electrode burning a length of about 150 mm of the electrode.The welding is to be carried out with an arc as short as possible and with current of about 150 amp. Alternating current a.c. is to be used when the electrode is proposed for approval with both a.c. and d.c. Before welding, the electrodes may be submitted to the normal drying process recommended by the Manufacturer.

The procedure for determining the hydrogen content is as follows:

a) within 30 seconds after the completion of the weld, the slag is to be removed and the samples quenched in water at approximately 20°C

b) after 30 seconds in water, the samples are to be cleaned and deposited in an apparatus suitable for the collection of the hydrogen by the displacement of glycerin (or paraffin). During the test, the glycerin is to be maintained at 45°C. All four samples are to be welded and subjected to the hydrogen test within 30 minutes.

c) the samples are to be kept soaking in glycerin for 48 hours; after being removed from the machine, the samples are to be cleaned by means of water and alcohol,

Table 25 : Chemical composition

Grade	Chemical composition (%)					
	C	Mn	Cr	Ni	Mo	Others
308	≤ 0,08	0,5 - 2,5	18 - 21	8 - 11	≤ 0,75	
308L	≤ 0,04	0,5 - 2,5	18 - 21	8 - 11	≤ 0,75	
316	≤ 0,08	0,5 - 2,5	17 - 20	11 - 14	2 - 3	
316L	≤ 0,04	0,5 - 2,5	17 - 20	11 - 14	2 - 3	
316LN	≤ 0,04	0,5 - 2,5	17 - 20	10 - 14	2 - 3	0,15 ≤ N ≤ 0,20
317	≤ 0,08	0,5 - 2,5	17 - 21	11 - 14	2,5 - 4	
317L	≤ 0,04	0,5 - 2,5	17 - 21	11 - 14	2,5 - 4	
309	≤ 0,15	0,5 - 2,5	22 - 26	11 - 15	≤ 0,75	
309L	≤ 0,04	0,5 - 2,5	22 - 26	11 - 15	≤ 0,75	
309Mo	≤ 0,12	0,5 - 2,5	22 - 26	11 - 15	2 - 3	
310	0,08 - 0,20	1,0 - 2,5	25 - 28	20 - 22,5	≤ 0,75	
310Mo	≤ 0,12	1,0 - 2,5	25 - 28	20 - 22	2 - 3	
347	≤ 0,08	0,5 - 2,5	18 - 21	9 -11	≤ 0,75	8xC ≤ Nb+Ta ≤ 1

13.3 Test requirements

13.3.1 In the tests for checking the operating characteristics, the requirements specified in Articles [2], [5], [7], [8] for electrodes, submerged arc fluxes and wires for continuous wire processes, respectively, are to be met.

In the tests for checking the mechanical properties, the requirements specified in Tab 24 are to be met.

For consumables intended for welding Cr-Ni austenitic steels for which the approval is required with the additional symbol BT, the requirements on adsorbed energy in the impact test specified in the table are to be satisfied at the temperature of -196°C.

13.3.2 In the tests for checking the chemical composition of welding consumables intended for Cr-Ni austenitic steels, the limits in percentage specified in Tab 25 are to be satisfied.

In the tests for checking the chemical composition of welding consumables intended for austenitic-ferritic steels, the limits in percentage specified and guaranteed by the Manufacturer are to be satisfied.

13.4 Annual control tests

13.4.1 For the periodical control tests, in addition to the samples and tests for checking the mechanical properties as required for the consumables for welding C and C-Mn steels, the samples for checking the chemical composition are also to be effected.

13.4.2 For the "low C" welding consumables described in [13.2.2], the control tests are limited to one sample of deposited metal and to the checking of the chemical composition.

14 Consumables for welding aluminium alloys

14.1 Application

14.1.1 General *(1/1/2023)*

The requirements of this Article apply to wire or rod-gas combinations to be used for ~~for~~ welding the Al-Mg and Al-Si aluminium alloys specified in Ch 3, Sec 2.

(Unless otherwise stated in this Article, the requirements relevant to the procedure, tests samples and welding conditions are generally to be in accordance with those in Articles [7] and [8] relevant to the approval of consumables for welding with continuous wire process).

The welding consumables preferably to be used for the aluminium alloys concerned are divided into two categories, as follows:

a) W = wire electrode and wire gas combination for metal-arc inert gas welding (MIG, 131 according to ISO 4063:2009), tungsten inert gas welding (TIG, 141) or plasma arc welding (PAW, 15)

b) R = rod-gas combinations for tungsten inert gas welding (TIG, 141) or plasma arc welding (PAW, 15).

Note 1: For aluminium welding consumables, there is no unique relationship between the products (wire electrode, wire or rod) and the welding process used (TIG, MIG, PAW). Therefore the wire electrodes, wire or rods, in combination with the relevant shielding gas, will be approved on the basis of the above products form W and R and may be used, as appropriate, for one or more of the above processes.

14.1.2 Grading

The consumables are graded as specified in Tab 26 in accordance with the alloy type and strength level of the base materials used for the approval tests.

SECTION 4 APPROVAL OF WELDING PROCEDURES

1 General

1.1 Application

1.1.1 General

This Section specifies in Articles [2], [3] and [4] the requirements for the approval of welding procedures for steel materials, and in Article [6] those for aluminium alloys.

The requirements relevant to materials not covered herein are defined on a case-by-case basis following, as far as applicable, the criteria specified in this Section.

Provisions for approval of laser welding procedures of hull structural steels are given in Sec 5.

1.1.2 Special requirements

In the case of applications involving the storage and transport of liquefied gases, the requirements of Pt E, Ch 1, Sec 14 apply.

1.2 Welding procedure

1.2.1 Welding processes *(1/1/2023)*

The approval of the welding processes is, as a rule, required for the processes indicated below together with their relevant numbering according to ISO 4063:2009:

- metal arc welding with covered electrode: 111
- submerged arc welding with wire electrode: 121
- flux-cored wire metal arc welding without gas shield: 114
- metal arc inert gas welding (MIG welding): 131
- metal arc active gas welding (MAG welding): 135
- flux-cored wire metal arc welding with active gas shied: 136
- flux-cored wire metal arc welding with inert gas shield: 137
- tungsten inert gas arc welding (TIG welding): 141
- plasma arc welding: 15.

1.2.2 Welding consumables

Consumables approved in accordance with the requirements of Sec 2 are to be used within the limits of their approval.

When non-approved welding consumables are used, the requirements relevant to the qualification of the welding procedures are established on a case-by-case basis.

In any event, tests on a deposited metal sample are required.

Requirements relevant to the grade of welding consumables to be used are given in Sec 2 and, in particular for welding of hull structural steels, in Part B, Chapter 1, Sez 4.

1.2.3 Welding procedure specification

A welding procedure specification is to be prepared by the Manufacturer and proposed for approval; this document is also referred to as preliminary welding specification (pWPS) and may be modified and amended during the procedure tests as deemed necessary.

In its final version, the welding procedure specification (WPS) is to include all the parameters characterising the welding process; in particular, as applicable:

a) type of welding process and equipment, as appropriate
b) type of joint, preparation and backing material, if any
c) base metal and thickness range
d) filler metal
e) welding position
f) minimum preheat and maximum interpass temperature
g) post-weld heat treatment if applicable
h) shielding gas as applicable
i) welding parameters
j) other information relevant to the welding techniques as applicable.

1.2.4 Welding procedure approval

Welding procedure tests, according to the proposed pWPS, are to be carried out for the approval of the welding procedure.

The test pieces are to be chosen so as to cover all the production welds in accordance with the approval range of parameters given in [2.6].

The tests for approval of the welding procedure (welding and testing) are to be witnessed by the Surveyor.

The actual parameters used for welding the approval test pieces and the results of the inspections and tests carried out are to be recorded in the WPQR (welding procedure qualification record).

The WPQR is generally prepared by the shipyard or welding shops and is to be signed for validation by the Surveyor.

1.2.5 Certificate of approval of the welding procedure

Upon the satisfactory completion of the approval tests, a certificate of approval of the welding procedure is generally issued by TASNEEF to the individual users, stating the conditions of the approval of the WPS such as thickness range, positions, steel grades and additional conditions for the application of the process, as deemed necessary, on the basis of the indications already given in the WPS.

1.2.6 Inspections

Inspections and control tests may be periodically and randomly required as deemed necessary by TASNEEF and are to