Rules for the Type Approval of Mechanical Joints for Pipes

Effective from 1 January 2025

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MARITIME

GENERAL CONDITIONS

Definitions:

Administration" means the Government of the State whose flag the ship is entitled to fly or under whose authority the ship is authorized to operate in the specific case.

"**IACS**" means the International Association of Classification Societies.

"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 shipbuilder, 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 shipowner, 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.

"**Rules**" in these General Conditions means the documents below issued by the Society:

(i) Rules for the Classification of Ships or other special units.
(ii) Complementary Rules containing the requirements for product, plant, system and other certification or containing the requirements for the assignment of additional class notations;
(iii) Rules for the application of statutory rules, containing the rules to perform the duties delegated by Administrations.
(iv) Guides to carry out particular activities connected with Services;
(v) Any other technical document, for example, rule variations or interpretations.

"Services" means the activities described in paragraph 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, for example, offshore structures, floating units and underwater craft.

"Society" or "TASNEEF" means TASNEEF Maritime

"**Surveyor**" means technical staff acting on behalf of the Society in performing the Services.

"**Force Majeure**" means damage to the ship; unforeseen inability of the Society to attend the ship due to government restrictions on right of access or movement of personnel; unforeseeable delays in port or inability to discharge cargo due to unusually lengthy periods of severe weather, strikes or civil strife; acts of war; or other force majeure.

1. Society Roles

1.1. The purpose of the Society is, among others, the classification and certification of ships and the certification of their parts and components. In particular, the Society:
(i) sets forth and develops Rules.
(ii) publishes the Register of Ships.
(iii) Issues certificates, statements and reports based on its survey activities.
1.2. The Society also takes part in the implementation of national and international rules and standards as delegated by various Governments.
1.3. 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.

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2. Rule Development, Implementation and Selection of Surveyor

2.1. The Rules developed by the Society reflect the level of its technical knowledge at the time they are published therefore, the Society, although also committed through its research and development services to continuous updating of the Rules, does not guarantee the Rules 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 based on 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.tasneef.ae.
2.3. Society exercises due care and skill:
(i) In the selection of its Surveyors
(ii)In the performance of its Services, taking into account the level of its technical knowledge at the time the 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 the Ship or the items subject to certification. The surveys and checks made by the Society on board ship do not necessarily require the constant and continuous presence of the Surveyor. The Society may also commission laboratory testing, underwater inspection and other checks carried out by and under the responsibility of qualified service suppliers. 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.

3. Class Report & Interested Parties Obligation

3.1. The class assigned to a Ship, like the reports, statements, certificates or any other document or information issued by the Society, reflects the 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).
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.
3.2. 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 authorized bodies and no other purpose. Therefore, the Society cannot be held liable for any act made or document issued by other parties based on 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, is governed by the Rules of the Society, which is the sole subject entitled to make such 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.
3.3. 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.

3.4. Any document issued by the Society about its activities reflects the condition of the Ship or the subject of certification or other activity at the time of the check.
3.5. The Rules, surveys and activities performed by the Society, reports, certificates and other documents issued by the Society are in no way intended to replace the duties and responsibilities of other parties such as Governments, designers, shipbuilders, manufacturers, repairers, suppliers, contractors or sub-contractors, Owners, operators, charterers, underwriters, sellers or intended buyers of a Ship or other product or system surveyed.

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 ship 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.
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.
In consideration of the above, the Interested Party undertakes to relieve and hold harmless the Society from any third-party claim, as well as from any liability about the latter concerning the Services rendered.
Insofar as they are not expressly provided for in these General Conditions, the duties and responsibilities of the Owner and Interested Parties concerning the services rendered by the Society are described in the Rules applicable to the specific service rendered.

4. Service Request & Contract Management

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, 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.

4.3 The contractor for the classification of a ship or for the services may be terminated and any certificates revoked at the request of one of the parties, subject to at least 30/60/90 days' notice, to be given in writing. Failure to pay, even in part, the fees due for services carried out by the society will entitled the society to immediately terminate the contract and suspend the service.
For every termination of the contract, the fees for the activities performed until the time of the termination shall be owned 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.
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 society will be withdrawn in those cases where provided for by agreements between the society and the flag state.

5. Service Accuracy

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 **Rule Development, Implementation and Selection of Surveyor** 2.4), it is not possible to guarantee absolute accuracy, correctness and completeness of any information or advice supplied. Express and implied warranties are specifically disclaimed.

6. Confidentiality & Document sharing

6.1. 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 authorization of the Interested Party, except as provided for or required by any applicable international, European or domestic legislation, Charter or other IACS resolutions, or order from a competent authority. Information about the status and validity of class and statutory certificates, including transfers, changes, suspensions, withdrawals of class, recommendations/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.
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.

6.2. Notwithstanding the general duty of confidentiality owed by the Society to its clients in clause 7.1 below, the Society's clients hereby accept that the Society may 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.
6.3. 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 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 about the provision of plans and drawings to the new Society, either by way of the appropriate stipulation in the building contract or by other agreement.
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 has come to the knowledge of the Society while carrying out its Services, even if related to a period prior to transfer of ownership.

7. Health, Safety & Environment

7.1. The clients such as the designers, shipbuilders, manufacturers, repairers, suppliers, contractors or sub-contractors, or other product or system surveyed who have a registered office in ABU Dhabi; should have an approved OSHAD as per Abu Dhabi OHS Centre, or, if they do not need to have an approved OSHAD, they shall comply with TASNEEF standards and have procedures in place to manage the risks from their undertakings.

7.2. For the survey, audit and inspection activities onboard the ship, the ship's owner, the owner representative or the shipyard must follow TASNEEF rules regarding the safety aspects.

8. Validity of General Conditions

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

9. Force Majeure

9.1 Neither Party shall be responsible to the other party for any delay or failure to carry out their respective obligations insofar as such delay and failure derives, directly or indirectly, and at any time, from force majeure of any type whatsoever that lies outside the control of either Party.

9.2 The Party that is unable to fulfil the agreement due to Force Majeure shall inform the other party without delay and in all cases within 7 days from when such force majeure arose.

9.3 It is understood that if such force majeure continues for more than 30 days, the Party not affected by the event may terminate this agreement by registered letter. The rights matured until the day in which the force majeure occurred remain unaffected.

10. Governing Law and Jurisdiction

This Agreement shall be governed by and construed in accordance with the laws of Abu Dhabi and the applicable Federal Laws of the UAE.
Any dispute arising out of or in accordance with this Agreement shall be subject to the exclusive jurisdiction of the Abu Dhabi courts.

11. Code of Business conduct

The **CLIENT** declares to be aware of the laws in force about the responsibility of the legal persons for crimes committed in their interest or to their own advantage by persons who act on their behalf or cooperate with them, such as directors, employees or agents.
In this respect, the **CLIENT** declares to have read and fully understood the "**Ethical Code**" published by **TASNEEF** and available in the **TASNEEF** Web site.
The **CLIENT**, in the relationships with **TASNEEF**, guarantees to refrain from any behaviour that may incur risk of entry in legal proceedings for crimes or offences, whose commission may lead to the enforcement of the laws above.
The **CLIENT** also acknowledges, in case of non-fulfilment of the previous, the right of **TASNEEF** to unilaterally withdraw from the contract/agreement even if there would be a work in progress situation or too early terminate the contract/agreement. It's up to **TASNEEF** to choose between the two above mentioned alternatives, and in both cases a registered letter will be sent with a brief sum-up of the circumstances or of the legal procedures proving the failure in following the requirements of the above-mentioned legislation.

In light of the above, it is forbidden to all employees and co-operators to:
- receive any commission, percentage or benefits of any possible kind;
- Start and maintaining any business relationship with **Clients** that could cause conflict of interests with their task and function covered on behalf of **TASNEEF.**
- Receive gifts, travel tickets or any other kind of benefits different from monetary compensation, that could exceed the ordinary business politeness.

Violation of the above-mentioned principles allows **TASNEEF** to early terminate the contract and to be entitled to claim compensation for losses if any.

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1 PREMISE

In the Rules for the Classification of Ships, use is foreseen of mechanical joints type approved by Tasneef.

The expression “mechanical joints” means devices, as described in Pt C, Ch 1, Sec 10, [2.4.5] of the Rules for the classification of ships, intended for direct connection of pipe lengths other than by welding, flanges or threaded joints.

2 FIELD OF APPLICATION

These Rules apply to mechanical joints, where their use is foreseen by Pt C, Ch 1, Sec 10, [2.4.5] of the Rules for the Classification of Ships.

These requirements apply to any mechanical joint submitted for approval from 1 January 2008 and to any existing mechanical joint from the date of the first renewal of approval after 1 January 2008.

3 DOCUMENTATION

The request for type approval is to be submitted to Tasneef by the Manufacturer or by the Applicant, if authorised by the Manufacturer, and is to include:

a) the Manufacturer;
b) the designation of the product;
c) the product quality assurance system implemented;
d) a complete description of the product;
e) typical sectional drawings with all dimensions necessary for evaluation of joint design;
f) complete specification of materials used for all components of the assembly;
g) the proposed test procedure as required in [5];
h) the field of application with indication of:
   - maximum design pressures (pressure and vacuum);
   - maximum and minimum design temperatures;
   - conveyed media;
   - intended services;
   - maximum axial, lateral and angular deviation allowed by the Manufacturer;
   - installation details;
i) documentation relevant to previous tests and approvals, if any.

4 MATERIALS

The materials used for mechanical joints are to be compatible with the piping material and internal and external media.

The Manufacturer is to submit evidence to substantiate that all components are adequately resistant to working the media at the design pressure and temperature specified.

5 TESTS

5.1 General

The type tests specified in Tab 1 are to be carried out.

Tasneef reserves the right both to require more severe testing conditions and additional tests, if considered necessary to ensure the intended reliability, and also to accept alternative testing in accordance with national or international standards where applicable to the intended use and application.

Unless otherwise specified, the water or oil test fluid is to be used.

Table 1

Tests		Type of mechanical joint			References
		Compression couplings and pipe unions	Slip-on Joints		
			Grip type and Machine grooved type	Slip type	
1	Tightness test	+	+	+	[5.5.1]
2	Vibration (fatigue) test	+	+	-	[5.5.2]
3	Pressure pulsation test (1)	+	+	-	[5.5.3]
4	Burst pressure test	+	+	+	[5.5.4]
5	Pull-out test	+	+	-	[5.5.5]
6	Fire endurance test	+ (3)	+	+	[5.5.6] if required in Pt C, Ch 1, Sec 10, [2.4.5] of the Rules for the Classification of Ships
7	Vacuum test	+ (3)	+	+	[5.5.7] for suction lines only
8	Repeated assembly test	+ (2)	+	-	[5.5.8]

Abbreviations: + test is required
- test is not required

Footnotes: 1) for use in all Class I and II systems and those Class III systems where pressure pulsation other than water hammer is expected.
2) Except permanent joint type (e.g. press type and swage type).
3) except joints with metal-to-metal tightening surfaces

5.2 Selection of test specimens

Type tests are to be carried out in the presence of a Tasneef Surveyor on at least one sample of each type and size of mechanical joint for which type approval is required.

Where there is a variety of size of joints requiring approval, a minimum of three separate sizes, representative of the range, from each type of joint to be tested in accordance with Tab 1 are to be selected.

5.3 Mechanical joint assembly

Assembly of mechanical joints is to consist of components selected in accordance with [5.2] and the pipe sizes appropriate to the design of the joints. Where pipe material would affect the performance of mechanical joints, the selection of joints for testing is to take the material into consideration.

Where not specified, the length of pipes to be connected by means of the joint to be tested is to be at least five times the pipe diameter. Before assembling the joint, conformity of components to the design requirements is to be verified. In all cases the assembly of the joint is only to be carried out according to the Manufacturer's instructions. No adjustment operations on the joint assembly, other than that specified by the Manufacturer, are permitted during the test.

5.4 Test results acceptance criteria

Where a mechanical joint assembly does not pass all or any part of the tests in Tab 1, two assemblies of the same size and type that failed are to be tested and only those tests where the mechanical joint assembly failed in the first instance are to be repeated. In the event that one of the assemblies fails the second test, that size and type of assembly is to be considered unacceptable.

The methods and results of each test are to be recorded and reproduced as and when required.

5.5 Test methods

5.5.1 Tightness test

In order to ensure correct assembly and tightness, all mechanical joints are to be subjected to a tightness test, as follows.

a) The mechanical joint assembly test specimen is to be connected to the pipe or tubing in accordance with the requirements of [5.3] and the Manufacturer's instructions, filled with test fluid and de-aerated. Mechanical joint assemblies intended for use in rigid connections of pipe lengths are not to be longitudinally restrained.

The pressure inside the joint assembly is to be slowly increased to 1,5 times the design pressure. This test pressure is to be retained for a minimum period of 5 minutes.

In the event of a drop in pressure or visible leakage, the test (including the fire test) is to be repeated for two further specimens. If during the repeat test one test piece fails, the coupling is regarded as having failed.

An alternative tightness test procedures, such as a pneumatic test, may be accepted.

b) For compression couplings a static gas pressure test is to be carried out to demonstrate the integrity of the mechanical joint assembly for tightness under the influence of gaseous media. The pressure is to be raised to design pressure or 7 MPa, whichever is the lesser.

c) Where the tightness test is carried out using gaseous media as permitted in a) above, the static pressure test mentioned in b) above need not be carried out.

5.5.2 Vibration (fatigue) test

In order to establish the capability of the mechanical joint assembly to withstand fatigue, which is likely to occur due to vibrations under service conditions, the mechanical joint assemblies are to be subjected to the following vibration test.

At the conclusion of the vibration test the coupling is to show no leakage or damage.

a) **Testing of compression couplings and pipe unions**

Compression couplings and pipe intended for use in rigid pipe connections are to be as follows. Rigid connections are joints connecting pipe length without free angular or axial movement.

Two lengths of pipe are to be connected by means of the joint to be tested. One end of the pipe is to be rigidly fixed while the other end is to be fitted to the vibration rig. The test rig and the joint assembly specimen being tested are to be arranged as shown in Fig 1.

The joint assembly is to be filled with test fluid, de-aerated and pressurised to the design pressure of the joint.

The pressure during the test is to be monitored. In the event of a drop in pressure and visible leakage, the test is to be repeated as described in [5.4].

Visual examination of the joint assembly is to be carried out.

Re-tightening may be accepted once during the first 1000 cycles.

Vibration amplitude is to be within 5% of the value calculated from the following formula:

$$A = \frac{2 \times S \times L^2}{3 \times E \times D}$$

where:
A: single amplitude, mm
L: length of the pipe, mm
S: allowable bending stress in N/mm^2 based on 0,25 of the yield stress
E: modulus of elasticity of tube material (for mild steel, E =210 kN/mm^2)
D: outside diameter of the pipe, mm.
The test specimen is to withstand not less than 10^7 cycles with frequency 20-50 Hz without leakage or damage.

b) **Grip type and machine grooved type joints**
Grip type joints and other similar joints containing elastic elements are to be tested in accordance with the following method.
A test rig of cantilever type used for testing fatigue strength of components may be used. The specimen being tested is to be arranged in the test rig as shown in Fig 2.
Two lengths of pipes are to be connected by means of the joint assembly specimen to be tested. One end of the pipe is to be rigidly fixed while the other end is to be fitted to the vibrating element on the rig. The length of pipe connected to the fixed end is to be kept as short as possible and in no case exceed 200 mm.
Mechanical joint assemblies are not to be longitudinally restrained.
The assembly is to be filled with test fluid, de-aerated and pressurised to the design pressure of the joint. The preliminary angle of deflection of the pipe axis is to be equal to the maximum angle of deflection recommended by the Manufacturer. The amplitude is to be measured at a distance of 1 m from the centre line of the joint assembly at the free pipe end connected to the rotating element of the rig (see Fig 2).
The test parameters are to be as indicated in Table 2 and to be applied on the same assembly.
Pressure during the test is to be monitored. In the event of a drop in pressure and visual signs of leakage, the test is to be repeated as described in [5.4]. Visual examination of the joint assembly is to be carried out for signs of damage which may eventually cause leakage.

Table 2

Number of cycles	Amplitude, mm	Frequency, Hz
$3 \cdot 10^6$	± 0,06	100
$3 \cdot 10^6$	± 0,5	45
$3 \cdot 10^6$	± 1,5	10

Figure 1

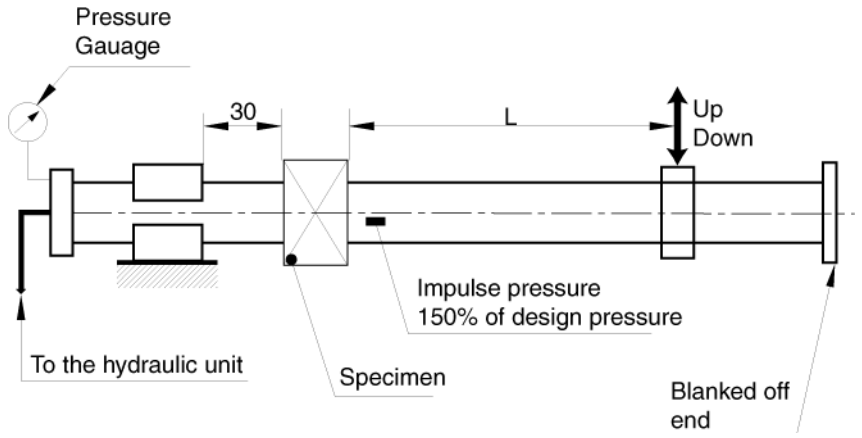
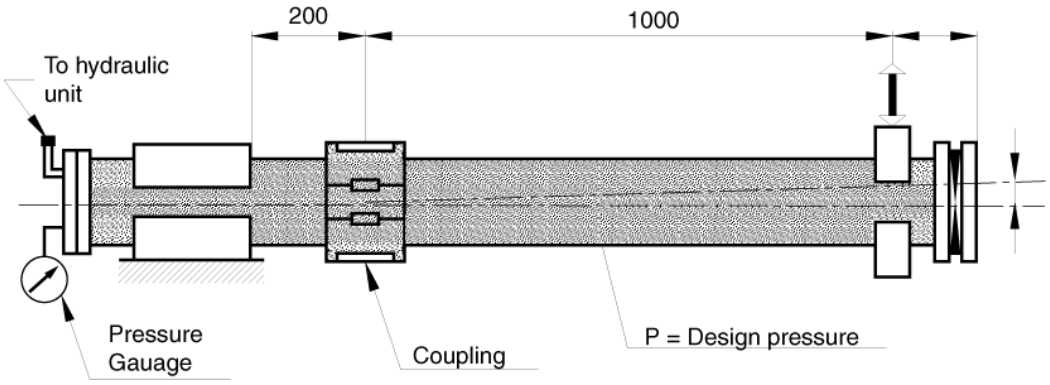


Figure 2



5.5.3 Pressure pulsation test

In order to determine the capability of the mechanical joint assembly to withstand pressure pulsation likely to occur during working conditions, joint assemblies intended for use in rigid connections of pipe lengths are to be tested in accordance with the following method.

The mechanical joint specimen for this test may be the same as that used in the test in [5.5.1] a) provided it passed such test.

The vibration test in [5.5.2] and the pressure pulsation test are to be carried out simultaneously for compression couplings and pipe unions.

The mechanical joint test specimen is to be connected to a pressure source capable of generating pressure pulses of the magnitude shown in Fig 3.

Impulse pressure is to be raised from 0 to 1,5 times the design pressure of the joint with a frequency equal to 30-100 cycles per minute. The number of cycles is not to be less than 5×10^5.

The mechanical joint is to be examined visually for signs of leakage or damage during the test.

5.5.4 Burst pressure test

The mechanical joint test specimen is to be connected to the pipe or tubing in accordance with the requirements of [5.3], filled with test fluid, de-aerated and pressurised to test pressure with an increasing rate of 10% per minute of test pressure. The mechanical joint assembly intended for use in rigid connections of pipe lengths is not to be longitudinally restrained.

The duration of this test is to be not less than 5 minutes at the maximum pressure. This pressure value is to be annotated.

Where considered convenient, the mechanical joint test specimen used in the tightness test in [5.5.1] may be used for the burst test provided it passed such test.

The specimen may have small deformation whilst under test pressure, but no leakage or visible cracks are permitted.

5.5.5 Pull-out test

In order to determine the ability of a mechanical joint assembly to withstand the axial load likely to be encountered in service without the connecting pipe becoming detached, the following pull-out test is to be carried out.

A pipe length of suitable size is to be fitted to each end of the mechanical joint assembly test specimen. The test specimen is to be pressurised to design pressure. When pressure is attained, an external axial load is to be imposed with a value calculated by the following formula:

$$L = \frac{\Pi}{4} \times D^2 \times p$$

where:

D: pipe outside diameter, mm

p: design pressure, MPa

L: applied axial load, N

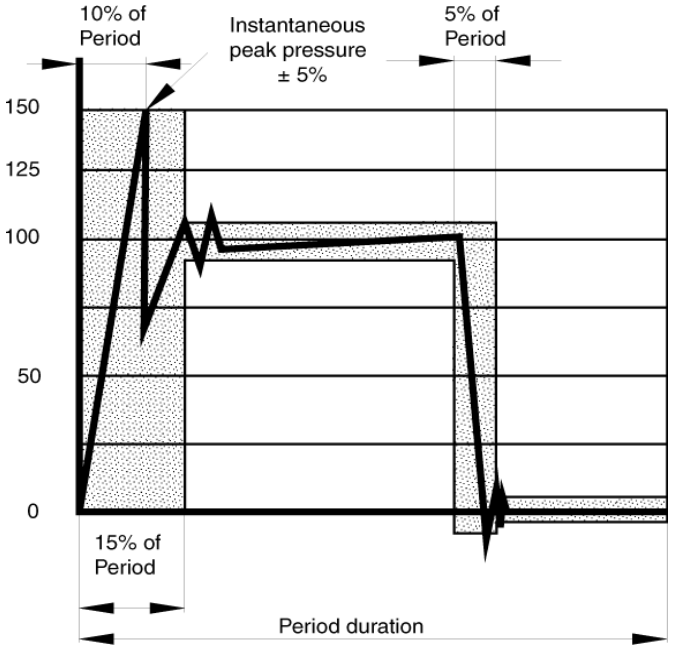
The pressure and axial load are to be maintained for a period of 5 minutes.

During the test, pressure is to be monitored and relative movement between the joint assembly and the pipe measured.

The mechanical joint assembly is to be visually examined for drop in pressure and signs of leakage or damage.

There is to be no movement between the mechanical joint assembly and connecting pipes.

Figure 3: Impulse pressure diagram



5.5.6 Fire endurance test

In order to establish the capability of the mechanical joints to withstand the effects of fire which may be encountered in service, the joints are to be subjected to a fire endurance test. The fire endurance test is to be conducted on the selected test specimens as per the following standards:

a) ISO19921:2005: Ships and marine technology – Fire resistance of metallic pipe components with resilient and elastomeric seals - Test methods
b) ISO19922:2005: Ships and marine technology – Fire resistance of metallic pipe components with resilient and elastomeric seals - Requirements imposed on the test bench.

Notes: clarifications to the standard requirements in ISO19921:2005, Paragraphs 7.2, 7.4, 7.6 and 7.7:

1. If the fire test is conducted with circulating water at a pressure different from the design pressure of the joint (however of at least 0,5 MPa), the subsequent pressure test is to be carried out to 1,5 times the design pressure.
2. If the fire test is required in Pt C, Ch 1, Sec 10,Tab 16 of the Rules for the Classification of Ships to be "8 min dry + 22 min wet" or "30 min dry", i.e. conducted for a period of time without circulating of water, the following test conditions apply:
   - **Test condition "8 min dry + 22 min wet"**

     The test piece is not required to be rinsed with the test medium (water) in preparation for the test as required in Paragraph 7.2 of ISO 19921:2005. The exposure to fire is to be started and continued for 8 minutes with the sample dry; after 8 minutes of dry test condition the piping system is to be filled with water and test pressure is to be increased up to at least 5 bar within 2 minutes, then maintained to at least 5 bar. After further 22 minutes (i.e. 30 minutes from initial exposure to fire) the exposure to fire is to be stopped and a hydrostatic pressure test as specified in 1. is to be carried out.
   - **Test condition "30 min dry"**

     The exposure to fire is to be started and continued for 30 minutes with the sample dry. After 30 minutes the exposure to fire is to be stopped and a hydrostatic pressure test as specified in 1. is to be carried out.

Note:

For fire tests in dry condition the pressure inside the test specimen is to be monitored for a rise due to heating of the enclosed air. Means of pressure relief should be provided where deemed necessary.

High pressures created during this test can result in failure of the test specimen. Precautions are to be taken to protect personnel and facilities.

Paragraph 7.5 of ISO 19921:2005 does not apply to the dry tests and no forced air circulation is to be arranged.

For fire endurance test requiring exposure time greater than 30 minutes test conditions are adjusted to meet the extended required total exposure time. In all cases for dry-wet test the minimum dry test exposure time is 8 minutes.

3. A selection of representative nominal bores may be tested in order to evaluate the fire resistance of a series or range of mechanical joints of the same design.

   When a mechanical joint of a given nominal bore (DN) is so tested then other mechanical joints falling in the range DN to 2xDN (both inclusive) are considered accepted.
4. Alternative test methods and/or test procedures considered to be at least equivalent may be accepted at the discretion of the Classification Society in cases where the test pieces are too large for the test bench and cannot be completely enclosed by the flames.
5. Where thermal insulation is acceptable as a means of providing fire resistance, following requirements apply:
   1. Thermal insulation materials applied on couplings are to be non-combustible according to ISO 1182:2010 as required by the Fire Test Procedures Code defined in Regulation 3 of SOLAS Chapter II-2 as amended by IMO resolutions up to MSC.421(98). Precautions are to be taken to protect the insulation from being impregnated with flammable oils.
   2. At least the fire endurance and the vibration testing in Tab 1 are to be carried out with thermal insulation in place.
   3. A service restriction is to be stated on the type approval certificate that the mechanical joints are to be fitted with thermal insulation during the installation in cases where the mechanical joints are used where fire resistance is required, unless mechanical joints are delivered already fitted with thermal insulation before installation.

5.5.7 Vacuum test

In order to establish the capability of the mechanical joint assembly to withstand internal pressures below atmosphere, similar to the conditions likely to be encountered in service, the following vacuum test is to be carried out.

The mechanical joint assembly is to be connected to a vacuum pump and subjected to a pressure 0,017 MPa absolute. Once this pressure has stabilised, the mechanical joint assembly specimen being tested is to be isolated from the vacuum pump and this pressure is to be retained for a period of 5 minutes.

Pressure is to be monitored during the test.

No internal pressure rise is permitted.

5.5.8 Repeated assembly test

The mechanical joint test specimen is to be dismantled and reassembled 10 times in accordance with the Manufacturer's instructions and then subjected to a tightness test as defined in [5.5.1].

6 ISSUE AND VALIDITY OF THE TYPEAPPROVAL CERTIFICATE

Subject to the satisfactory outcome of the required checks and tests, Tasneef issues to the manufacturing firm a “Type approval certificate” valid for all mechanical joints of the same type, dimensions, material, etc, as that subjected to type tests.

The “Type approval certificate” is valid for five years from the date of issue.

7 RENEWAL OF THE TYPE APPROVALCERTIFICATE

In order to renew the “Type approval certificate”, the documentation in [3] is to be submitted to Tasneef with indication of any modifications in respect of the previous approval.

On the basis of the check of such documentation, Tasneef will establish the checks and tests to be carried out in order to renew the “Type approval certificate”.

8 REPETITION OF THE TESTS

Tasneef reserves the right to repeat type tests, wholly or in part, in the case of modification of the rules on the basis of which the type approval was issued or in the event of doubts or complaints.