

Rules for the Type Approval and Testing of Portable Flexible Hyperbaric Chambers

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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 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.

"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, as for example rule variations or interpretations.

"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" or "TASNEEF" means Tasneef and/or all the companies in the Tasneef Group which provide the Services.

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

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. 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 are 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, although committed also 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 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.tasneef.ae.

2.3. The 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 of 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.

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, 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 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, 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 certificate on 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 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.
- 3.5. 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, 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.

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 in relation to 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 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, 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 late payment, interest at the legal current rate increased by 1.5% may be demanded.

- 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.

For every termination of the contract, the fees for the activities performed until the time of the termination 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.

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 art. 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.

Therefore, except as provided for in paragraph 5.2 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.

- 5.2. Notwithstanding the provisions in paragraph 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). 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 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 AED5,000,000 (Arab Emirates Dirhams Five Millions only). Payment of compensation under this paragraph 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 paragraph 5.1 above.

- 5.3. 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: (i) THREE (3) MONTHS from the date on which the Services were performed, or (ii) THREE (3) 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. These General Conditions shall be governed by and construed in accordance with United Arab Emirates (UAE) law, and any dispute arising from or in connection with the Rules or with the Services of the Society, including any issues concerning responsibility, liability or limitations of liability of the Society, shall be determined in accordance with UAE law. The courts of the Dubai International Financial Centre (DIFC) shall have exclusive jurisdiction in relation to any claim or dispute which may arise out of or in connection with the Rules or with the Services of the Society.

- 6.2. However,

- (i) In cases where neither the claim nor any counterclaim exceeds the sum of AED300,000 (Arab Emirates Dirhams Three Hundred Thousand) the dispute shall be referred to the jurisdiction of the DIFC Small Claims Tribunal; and
- (ii) for disputes concerning non-payment of the fees and/or expenses due to the Society for services, the Society shall have the

right to submit any claim to the jurisdiction of the Courts of the place where the registered or operating office of the Interested Party or of the applicant who requested the Service is located.

In the case of actions taken against the Society by a third party before a public Court, the Society shall also have the right to summon the Interested Party or the subject who requested the Service before that Court, in order to be relieved and held harmless according to art. 3.5 above.

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 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.
- 7.2.** Notwithstanding the general duty of confidentiality owed by the Society to its clients in clause 7.1 above, 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.
- 7.3.** 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 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.
- 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.

Article 8

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

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1 - INTRODUCTION

These rules assume that what relates to the hyperbaric chamber is preserved and maintained according to the indications of the manufacturer and is operated according to the procedures indicated in the operation manual.

2 - FIELD OF APPLICATION

These rules apply to flexible hyperbaric chambers, portable both in containers (depressurized) and when in use, large enough to contain a person, with a pressurization system which is separate and independent of the breathing system.

In particular, the rules apply to:

- the materials used;
- elements which contribute to the structural strength of the chamber and of its components, etc.;
- operating functionality of the various systems (breathing, lighting, etc.).

The rules do not cover:

- the breathing mixtures used and the way they are stored;
- instructions for use and maintenance;
- medical provisions;
- provisions relevant to hygiene and habitability of the chambers;
- size of the chamber in relation to the means of transport which can be used;
- special precautions for the systems in relation to the type of gas used;
- decompression and compression speed tables as per 3 (k).

3 - GENERAL REQUIREMENTS

The flexible hyperbaric chambers are to have:

- (a) connections for the pressurization, depressurization, breathing, lighting and interphone systems as well as the valve seats and viewport, situated on rigid material parts; every connection should be univocal, coloured like the cable or piping to be connected and not accidentally disconnectable;
- (b) a viewport which, in terms of size and position, allows the person being carried to be seen, in particular the person face;
- (c) a breathing system provided with an external intake, and in the case of a system using oxygen, an external outlet for the gases breathed out;
- (d) a pressurization, depressurization and breathing gas supply system complying with the hyperbaric therapy foreseen in the operation manual;
- (e) all the devices to control the systems and gas pressure situated on the rigid head (and/or on the rigid hatch situated on the head) closing the entrance opening made in the flexible hull.
and be provided with:
 - (f) straps and relevant attachments suitable for fixing and holding an unconscious person lying on their back while the pressurized chamber is being lifted and transported;
 - (g) handles for transport by hand and guy ropes with a suspension ring;
 - (h) a rapid exhaust-valve with passage area at least three times the area of the pressurization piping;

- (i) special arrangements to fix the breathing gas cylinder equipped with special reducers and connections outside the chamber;
- (j) a nose-mouth mask for breathing equipped with a suitable microphone placed inside;
- (k) an operation manual including, among others, the decompression and compression speed tables to control decompression and relative emergencies in accordance with recognized national or international rules;
- (l) identification plate fixed to a rigid part of the chamber and on the container.

4 - DOCUMENTATION REQUIRED

For type approval of the flexible hyperbaric chamber, the manufacturer is to send a written application to Tasneef and submit the following documentation in triplicate for examination and/or approval:

- (a) general report on the manufacturing methods and on the procedures for internal control of the production;
- (b) detailed description of the hyperbaric chamber, its components and connections, construction materials, including their arrangement and organoleptic characteristics necessary to identify them, its systems and gases for pressurization and breathing;
- (c) operation manual for the hyperbaric chamber;
- (d) construction drawings, diagrams and specifications of the hyperbaric chamber, its connections and systems and also of the accessories including those to raise it. In particular, the mechanical properties of the materials should be indicated as well as the safety coefficients between the ultimate tensile stress and the stress due to internal pressure, in the range between the working and burst pressures. The specifications should be in line with the indications given in the operation manual and should include the maximum working pressure and burst pressure and also the temperature field within which the chamber is to be used.

5 - TESTING OF MATERIALS

5.1 - General

The flexible materials subject to pressure are to undergo the tests referred to in 5.2 to 5.11 below. The mechanical properties of the rigid materials of the hyperbaric chamber and of its components are to be determined according to the procedures foreseen in the relevant Tasneef rules. The samples are to be taken from the current production.

5.2 - Determination of the mass per unit area

The manufacturer is to state the value of the mass per unit area, in g/m^2 , of the flexible material. The check of this value is to be made in conformity with the standard ISO 2286-2:1998.

5.3 - Determination of the ultimate tensile stress and elongation of the material

The ultimate tensile stress for traction of the material, for both weft and warp, is to be determined in conformity with the standard ISO 1421:1998.

The ultimate tensile stress is not to be less than four times the stress, given in the drawings and/or specifications of point 4 above, derived from the working pressure.

The elongation percentage is not to be higher than 35%.

5.4 - Determination of the ultimate tensile stress after artificial aging of the material

The ultimate tensile stress of the material, after artificial aging in air obtained by maintaining the samples at a temperature of 65°C for 7 days, determined as indicated in 5.3 above, is not to be less than 85% of the ultimate tensile stress of the material as per 5.3.

5.5 - Determination of the ultimate tensile stress of the material following thermal cycles

The samples of the material are to undergo the following thermal cycle 10 times:

- 8 hours at a temperature of -30°C;
- 8 hours at a temperature of 65°C.

Alternatively, these temperature values may be substituted, respectively, by the lowest and the highest temperature for which use of the hyperbaric chamber is foreseen.

The ultimate tensile stress, determined as indicated in point 5.3 above, is not to be less than 85% of the ultimate tensile stress of the material as per 5.3.

5.6 - Determination of the ultimate tensile stress of the connections

The ultimate tensile stress of any connections, determined, as indicated in point 5.3 above, on samples with the connection piece in the middle, is not to be less than the ultimate tensile stress of the material without the connection as per 5.3.

5.7 - Determination of resistance to abrasion

The test is to be carried out according to the standard ISO 5470-1:1999 using the abrasimeter Taber (400 cycles, grindstone Teledin Taber CS 17, load 500 g, aspiration speed 70 with 16 mm distance). Loss due to abrasion on the external surface of the material is not to be higher than 0,30 g.

5.8 - Determination of resistance to tearing

The test is to be carried out in conformity with the standard ISO 4674-1:2003. Resistance to tearing is not to be less than 98 N.

5.9 - Determination of resistance to perforation

The test consists in verifying that the force necessary to perforate the flexible material, when taut around a ring 100 mm in diameter, is not less than 40 N or 125 N respectively, depending on whether a point or a chisel with the following characteristics is used:

point: cone of 30° with spherical extremity of 0,5 mm radius;

chisel: length 12,5 mm, tapered on one side with an angle of 30° and with a flat extremity of 0,5 mm thickness.

The test is to be carried out on 3 samples if perforated by the point and on 6 samples, of which 3 in weft and 3 in warp, if perforated by the chisel. The force of the perforation is to be measured using a dynamometer, suitable for recording the compression forces, operating at a speed of 100 mm/min.

5.10 - Determination of resistance to ozone

The test is to be carried out on 3 samples cut in the warp direction and on 3 samples cut in the weft direction, 100x20 mm each. The samples, bent on a mandril which has a 5 mm diameter and after having been conditioned for 24 hours in a dark ambient at a temperature of 22°C ± 2°C are to undergo exposure in an ozone chamber with a concentration of 0,5 ppm, a flow of 2,5 l/min, at a temperature of 22°C ± 2°C for 30 hours. At the end of the test, the samples should not show signs of cracks, peeling or visible swellings.

5.11 - Determination of the permeability of the material to the air

The test is to be carried out in conformity with the standard ISO/TR 6065.

5.12 - Determination of resistance to flame

The external surface of the flexible material of the hyperbaric chamber is to pass the test foreseen by Part 7, Annex 1 of the IMO International Code for application of Fire Test Procedures, 2010 with the flame applied for 15 s or the test of other rules deemed equivalent by Tasneef.

6 - PROTOTYPE TESTING OF THE HYPERBARIC CHAMBER

6.1 - General

Before carrying out the following tests, it should be checked that the general requirements listed under point 3 above have been met. The tests are to be carried out on one chamber, including all its components, and according to the sequence given in 6.2 to 6.7 below.

6.2 - Determination of resistance to saline mist

The chamber and all the components are to be placed in the containers in which they are sold. These containers, after being closed, are to be subjected for 10 consecutive days to continuous saline mist produced by a 5% sodium chloride solution, at a temperature of 35°C. At the end of the test, no appreciable corrosion should be found and the connections of the components of the systems should be operating normally.

6.3 - Control of the functioning of the systems, safety device and suitability of the lifting arrangements

The assembled chamber, loaded with a mass of 75 kg, distributed like that of a person lying down, and provided with all its internal and external components, is to be pressurized at the calibration pressure of the safety valves precalibrated for a pressure not higher than 3% with respect to the working pressure. Control of the functioning of the plants is to be made by means of inert gas at the relative working pressure. Subsequently, it is to be ascertained that, with all the systems operating, decompression can be carried out in conformity with the tables given in the operation manual.

The chamber pressurized at the working pressure is to be suspended for at least 5 minutes from each of the handles used for transport by hand and subsequently, for at least 5 minutes from each strap and support ring; after every suspension, a visual examination should not reveal any signs of irreversible deformations.

6.4 - Assembly and pressurization tests of the hyperbaric chamber subjected to temperature variations

The chamber and all the components are to be placed in the containers in which they are sold and closed. These containers are to be subjected to the following conditioning for 24 hours:

- (a) temperature of about 20°C;
- (b) the lowest temperature at which the chamber can be used; to be assumed, unless stated otherwise in the operation manual, equal to -30°C;
- (c) the highest temperature at which the chamber can be used; to be assumed, unless stated otherwise in the operation manual, equal to +65°C.

Following each conditioning, the chamber and its components are to be removed from their containers and assembled, keeping them as far as possible at the conditioning temperature; assembly should be easy. Subsequently, the chamber is to be pressurized immediately to the working pressure according to the procedure in the operation manual. Reduction in pressure, with the valves closed, is not to be higher than 1% in one hour and a visual examination should not reveal signs of deterioration.

6.5 - Cyclic pressurization and depressurization tests

The chamber assembled and at a temperature of about 20°C is to be subjected to 14600 hydrostatic cyclic tests of pressurization and depressurization between the working pressure and 0,007 N/mm².

The length of every cycle is to be between 10 and 100 s. After the last cycle, the chamber is to be pressurized with air at the working pressure and depressurized as established in the tables of the operation manual; at no time is the difference between the actual pressure in the chamber and the pressure foreseen in the tables of the operation manual to be higher than 1%.

6.6 - Hydrostatic pressure test

The chamber is to be subjected, at a temperature of about 20°C, to hydrostatic pressure 1,5 times the working pressure, the water being about 20°C.

Reduction in pressure is not to exceed 1% in one hour. Furthermore, shifting of joints, cracks, swellings or other damage that may impair its use are not to occur.

6.7 - Burst test

The chamber is to be conditioned for the maximum operating temperature and gradually pressurized with water, at that temperature, until it breaks.

The burst pressure is to be not less than 4 times the working pressure.

For the purpose of this burst test, the rigid material parts of the chamber can be replaced by others of larger dimensions and suitable to withstand the burst pressure on condition that the resulting chamber is representative of the chamber subjected to the previous tests.

7 - TYPE APPROVAL CERTIFICATE

Following the successful outcome of the tests and checks required by these rules, Tasneef issues a type approval certificate.

8 - TESTING OF THE MASS PRODUCTION

Every mass produced hyperbaric chamber is to undergo testing as follows:

- (a) the Tasneef technician shall ascertain that every chamber complies with the documentation (drawings, specifications, operation manual, etc.) relevant to the approved prototype;
- (b) every chamber is to undergo, in the presence of the Tasneef technician:

- (1) a pneumatic pressure test at ambient temperature and working pressure; the decrease in pressure, with the valves closed, is not to be higher than 1% in one hour and a visual examination should not reveal signs of deterioration;
- (2) a hydrostatic pressure test at ambient temperature at 1,5 times the working pressure; the reduction in pressure, with the valves closed, is not to be higher than 1% in one hour and a visual examination should not reveal shifting of joints, cracks, swellings or other damage that may impair its use.

As an alternative to the above-mentioned tests, only one pneumatic pressure test at 1,5 times the working pressure need be carried out, on condition that suitable precautions are taken for personal safety.

- (c) check of the functioning of the systems, safety device and suitability of the lifting arrangements referred to in 6.3.

9 - IDENTIFICATION PLATES

The hyperbaric chambers are to be identified by means of a permanent and indelibly marked plate, fixed to a rigid material part as well as to the container, with the following data:

- (a) name and address of the manufacturer;
- (b) serial type and number;
- (c) manufacturing date;
- (d) working pressure;
- (e) burst pressure;
- (f) type of breathing gas;
- (g) volume and pressure of the cylinder for the above gas;
- (h) external temperature field for use;
- (i) number and date of the operation manual;
- (j) particulars of the type approval certificate;
- (k) particulars of the Tasneef testing;
- (l) expiry date of the periodical tests (to be kept up to date).

10 - PERIODICAL TESTS

Every mass produced hyperbaric chamber tested as required under point 8 is to undergo the following ascertainments and tests to be performed in the presence of the Tasneef surveyor at a workshop authorized by the manufacturer.

- (a) After 5 years from the date of the test, it is to be ascertained that the container, the chamber and its accessories, the documentation and operation manual are in good condition and the checks in 6.3 are to be carried out.
- (b) 10 years after the test and subsequently every five years, the checks in para (a) above and the tests in 8 (b) are to be carried out.

11 - VALIDITY OF THE TYPE APPROVAL CERTIFICATE

The type approval certificate is valid for 5 years from the date of issue of the certificate.

12 - RENEWAL OF THE TYPE APPROVAL CERTIFICATE

For the purpose of renewing the certificate, any documentation as per point 4 to be modified with respect to that presented for the previous approval is to be submitted to Tasneef.

On the basis of an examination of this documentation, Tasneef shall establish the tests and ascertainments necessary to renew the certificate.