RUSSIAN MARITIME REGISTER OF SHIPPING

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GENERAL REGULATIONS
FOR THE SUPERVISION OF CONTAINERS

RULES
FOR THE CONSTRUCTION OF CONTAINERS

RULES
FOR THE APPROVAL OF CONTAINERS FOR THE TRANSPORT OF GOODS UNDER CUSTOMS SEAL

GUIDELINES
ON THE SUPERVISION OF CONTAINERS IN SERVICE

НД No 2-090201-005-E

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These Rules and Guidelines have been approved in accordance with current Provisions. The date of coming into force of the present Rules and Guidelines is 1 july 2002. They apply to high-capacity containers intended for the carriage of goods by water, rail and road.

The present edition of the Rules and Guidelines is based on the 1997 Rules and Guidelines taking into account the amendments and additions contained in Notice No.1 (1999), No.2 (1999), No.3 (2000) as well as those prepared just before reedition.

The requirements of the International Convention for Safe Containers, 1972, as amended in 1981, 1983, 1991, 1992 and 1993, the Customs Convention on Containers, 1972, Regulations for the Transportation of Dangerous Goods by Sea, IACS Unified Requirements, ISO standards, European standards, IMO resolutions, and UN Recommendations on the Transport of Dangerous Goods as well as the national standards have been taken into account in the present Rules and Guidelines.

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GUIDELINES ON THE SUPERVISION OF CONTAINERS IN SERVICE

GENERAL REGULATIONS
FOR THE SUPERVISION OF CONTAINERS

1 GENERAL

1.1 DEFINITIONS AND EXPLANATIONS

1.1.1 For the purpose of these Rules the following definitions are adopted:

Additional requirements are requirements not contained in the Rules and set forth by Russian Maritime Register of Shipping [1] in carrying out the supervision.

Article means a machinery, an appliance, a pressure vessel, an apparatus, a device, an item of equipment or outfit to which the requirements of the Rules are applicable.

Rules mean the Rules stated in 1.3.

Standard is a term which, for the purpose of the Rules, means all kinds of standards or technical and normative documents of any countries approved or recognized by the Register.

1.2 SUPERVISION

1.2.1 The Register is a state body of technical supervision of high-capacity containers. Being a member of the International Association of Classification Societies (IACS), the Register follows IACS decisions and the provisions of IACS Code of Ethics. The Register's Quality System complies with IACS requirements and applicable requirements of ISO standard 9001, which is confirmed by IACS Certificate issued on the basis of results of the appropriate audits.

1.2.2 The Register is authorized to exercise on behalf of the Government the supervision of implementation of the provisions of internal conventions and agreements to which the Russian Federation or any other State the Government of which has authorized the Register to conduct this kind of activities is a party, in so far as matters within the Register's scope are concerned.

1.2.3 The Register establishes technical requirements for containers guided by the provisions of the International Convention for Safe Containers, 1972, as amended in 1981, 1983, 1991, 1992 and 1993[2] and the Customs Convention on Containers, 1972[3], Rules for the Transport of Dangerous Goods by Sea (MOPOG Rules), the International Maritime Dangerous Goods Code (IMDG Code), the national and international standards and performs control of these requirements being acted along.

1.2.4 Supervision is performed according to the Rules issued by the Register, and is aimed to determine whether the containers liable to supervision of the Register, as well as the materials and articles involved, meet the provisions of the Rules and the additional requirements.

The Rules and additional requirements are obligatory for design offices, manufacturers of containers, container owners, works supplying materials and equipment for containers and those engaged in the repair and maintenance of containers subject to supervision of the Register.

The supervising activities of the Register do not supersede the quality control services of the container owners and manufacturers.

1.2.5 The Register performs technical supervision of the containers, materials and articles involved during design, manufacture and service.

1.2.6 The Register considers and approves the draft standards and normative documents related to its activities.

1.2.7 The Register may participate in investigations of matters lying within its scope.

1.2.8 The fees for the performed work are charged by the Register according to the Register's scale of fees. Additional fees are charged by the Register in the case of additional expenses incurred in the course of rendering of service (for instance, traveling expenses, services rendered out of hours etc.).

1.3 RULES

1.3.1 Applicable Rules.

1.3.1.1 The Rules used by the Register in supervising the containers under manufacture and in service are:

.1 General Regulations for the Supervision of Containers;

.2 Rules for the Construction of Containers, consisting of:

Part I. Basic Requirements,
Part II. General Cargo Containers,
Part III. Thermal Containers,
Part IV. Tank Containers,
Part V. Platform Containers,
Part VI. Non-Pressurized Bulk Containers;

.3 Rules for the Approval of Containers for the Transport of Goods under Customs Seal;

[1] Hereinafter called "the Register".
[2] Hereinafter called "the CSC Convention".
[3] Hereinafter called "the CCC Convention".

.4 Rules for the Classification and Construction of Sea-Going Ships as applied to the containers.

1.3.1.2 In addition to the Rules stated in 1.3.1.1, the following normative documents are used by the Register in performing supervision:

.1 Guidelines on Technical Supervision during Construction of Ships and Manufacture of Materials and Equipment;

.2 Guidelines on Supervision of Containers during Manufacture;

.3 Guidelines on Supervision of Containers in Service;

.4 Directives for the Design, Manufacture, Service and Repair of Pressure Vessels for the Storage and Transport of Dangerous Goods.

1.3.2 Application of the Rules to containers under manufacture and to articles intended for containers.

1.3.2.1 Newly published Rules, as well as modifications introduced in the Rules, come into force from the date specified in the annotation to the publication, unless other terms are fixed in particular cases. Until the date of entry into force, they shall be considered as recommendation.

1.3.2.2 Interpretation of the requirements of the Rules and other normative documents of the Register is within the Register competence only.

1.3.2.3 The containers and articles whose designs are submitted for approval of the Register after the entry into force of the Rules, or modifications introduced in the Rules, shall satisfy the requirements of these Rules and modifications.

To the containers and articles whose technical documentation was submitted for approval prior to the entry into force of the Rules, those Rules are applicable which were in force on the date of approving that documentation.

1.3.3 Departures from the Rules.

1.3.3.1 The Register may agree to use of materials, structures or separate devices and items of the container, other than those specified in the Rules, provided they are at least as effective as those required by the Rules; departures from the Rules, which are covered by the international conventions and agreements, may be permitted by the Register only if the latter is satisfied that such departures are permissible under these conventions and agreements. In this case the Register shall be supplied with information enabling to ascertain that the materials, structures and articles involved meet the requirements which ensure trouble-free handling of the container and safe carriage of goods.

1.3.3.2 If the design of the container, its separate machinery, devices, units, equipment and outfit or the materials used cannot be regarded as sufficiently proved in service, the Register may require additional tests to be made during manufacture of the container and in the case of containers in service, may reduce the intervals between periodical surveys or increase the extent of such surveys.

1.4 DOCUMENTS

1.4.1 In the course of supervision the Register issues the appropriate documents.

1.4.2 Documents stating conformity of supervised containers, materials and articles with provisions of the Rules, additional requirements and availability of necessary test results, are:

.1 Certificates of Safety Approval by Design Type for the general cargo container, thermal container and tank container;

.2 Certificate of Container Approval by Design Type (in accordance with the Customs Convention on Containers);

.3 Certificate of Container Approval at a Stage Subsequent to Manufacture (in accordance with the Customs Convention);

.4 Certificate of Conformity of the prototype tank container;

.5 Certificate.

1.4.3 Other documents (survey reports, protocols, Type Approval Certificates etc.) may be issued by the Register in the course of supervision.

1.4.4 The documents are issued by the Register on the basis of satisfactory technical condition determined for the supervised object by means of inspections and tests.

1.4.5 The Register shall be notified of all the modifications (introduction of alterations to the design) of the certified containers. Such containers may be tested to the necessary extent, if required by the Register.

1.4.6 The Register may fully or partly recognize the documents issued by other classification societies, technical supervision bodies and other organizations.

1.4.7 In particular circumstances, the Register may give notification of its documents having ceased to be valid.

1.4.8 The validity of such documents may be restored, if the Register is satisfied that the grounds, which caused the loss of validity have been eliminated.

1.5 RESPONSIBILITIES ASSUMED BY THE REGISTER

1.5.1 The Register entrusts the performance of inspections to adequately qualified experts performing their functions with diligence and application. The Register bears responsibility for failure to meet its commitments or for their undue performance only in case of its fault (willful or negligent act).

2 TECHNICAL SUPERVISION

2.1 GENERAL

2.1.1 The scope of technical supervision includes:

.1 consideration of technical documentation;

.2 supervision during manufacture of materials and articles, specified in the Rules, intended for subsequent use in the supervised object;

.3 supervision during manufacture of containers;

.4 surveys of containers in service and surveys of containers under repair;

.5 issuance of the Register's documents;

.6 recognition of manufacturers, repair shops, other organizations involved in operation of containers, accreditation of laboratories for testing containers, materials and articles intended for the containers.

2.1.2 The basic method used by the Register in exercising supervision is random inspection, unless some other procedure has been adopted.

2.1.3 For the supervision to be carried out, container owners and manufacturers shall ensure that the representatives of the Register all afforded the possibility of conducting surveys of containers, free access to all places where materials or articles subject to supervision of the Register are manufactured and tested and shall provide all conditions for the supervision to be performed.

2.1.4 Container owners, design offices and the manufacturers of the containers shall fulfil the requirements set forth by the Register in performing supervision.

2.1.5 Any alterations relating to materials and the structural design of containers and articles to which the requirements of the Rules apply, planned by container owners and manufacturers shall be approved by the Register before they are made.

2.1.6 Controversial issues arising in the course of supervision may be transferred by container owners, manufacturers and other interested organizations directly to the higher Register Inspectorate. The judgement of the Register Head Office is final.

2.1.7 The Register may refuse from the supervision in case when the manufacturer systematically violates the Rules or agreement for Supervision contract concluded with the Register.

2.1.8 In case of revealing defects in a material or an article, which holds a valid document, the Register may require additional tests or appropriate corrections to be made, and if the defect cannot be remedied, may cancel this document.

2.2 SUPERVISION OF MATERIALS AND ARTICLES DURING MANUFACTURE

2.2.1 Relevant parts of the Rules contain the lists of materials and articles liable to supervision of the Register during manufacture.

If considered necessary, the Register may require that such materials and articles, which are not covered by said lists, should be also manufactured under its supervision.

2.2.2 The materials and articles liable to supervision of the Register are to be manufactured according to technical documentation approved by the Register.

2.2.3 A container manufactured in conformity with the approved technical documentation shall undergo the appropriate tests according to the procedures set out in the relevant Parts of the Rules for the Construction of Containers.

2.2.4 If, as a result of testing the prototype, the design of type-series containers, the associated equipment or the process of manufacture must be changed as compared with the approved documentation of the prototype, the manufacturer shall submit for consideration of the Register the documentation for series production of the containers, inclusive of the changes proposed.

3 TECHNICAL DOCUMENTATION

3.1 GENERAL

3.1.1 Prior to the commencement of the manufacture of containers, materials and articles, liable to supervision of the Register, the appropriate technical documentation shall be submitted to the Register outlined in the relevant Parts of the Rules for the Construction of Containers.

If necessary, the Register may require the scope of documentation to be increased.

Standards for certain materials and articles agreed with the Register may be substituted for the documentation in the whole or for a part thereof.

Standards not agreed with the Register may be submitted within the technical documentation of the container or article and are regarded as a constituent part thereof, while the possibility of their use in this particular case is confirmed by approval of the technical documentation without the standards themselves being agreed with the Register, to which effect a note is made in the letter of conclusion to be submitted by the Register to the author of the documentation (designer).

3.1.2 The changes which are introduced in the approved technical documentation in respect of the elements and structures, covered by the Rules, shall be submitted for consideration of the Register before proceeding with such changes.

3.1.3 The technical documentation submitted for consideration of the Register shall be drawn up in such a way, or is to supply such particulars, so as to afford clear evidence that the requirements of the Rules are met.

3.1.4 The calculations necessary for determining parameters and values regulated by the Rules are to be prepared according to the requirements of these Rules and according to procedures approved by the Register. The calculation procedures are to ensure sufficient accuracy of solving the problem, which is confirmed by prototype tests carried out under the appropriate provisions.

The Register does not verify the accuracy of calculations, including those obtainable from the computer, while taking into account their results during the consideration of the technical documentation.

Check calculations may be prepared under any program, if required by the Register.

3.1.5 The approval of technical documentation shall be confirmed by the stamps of the Register.

The approval does not apply to the elements and structures which are not covered by the Rules.

3.2 DURATION OF VALIDITY OF APPROVED TECHNICAL DOCUMENTATION

3.2.1 The Register approval of the technical documentation is valid for the period of 6 years. By the expiry of this term or in case when the interval between the date of documentation approval and the commencement of product manufacture exceeds 3 years, the documentation shall be checked and corrected to take account of the amendments to the Register's Rules, introduced during this period, and submitted to the Register for consideration.

The approval of the Register ceases to be valid if the above requirement is not fulfilled.

3.2.2 In justified cases, when serial products are manufactured, the validity term of the approved technical documentation specified in accordance with 3.2.1, may be extended by the Register for a period not longer than that required to manufacture (order) a lot of articles.

3.2.3 The standards on the containers and associated materials and articles are to be approved for a period of their validity.

When revising the standards these documents shall be checked to take account of the existing Rules and Regulations of the Register.

3.2.4 Notwithstanding the terms of approval, the technical documentation on containers, materials and articles as well as the approved standards shall be subjected to compulsory correction to take into account the adopted provisions of the international conventions and agreements, and the requirements of the instructions circularized by the Register which provide for their unconditional execution.

RULES
FOR THE CONSTRUCTION OF CONTAINERS

PART I. BASIC REQUIREMENTS

1 GENERAL

1.1 APPLICATION

1.1.1 The present Rules apply to high-capacity containers (gross mass of 10 t and upwards) intended for the carriage of goods by water, rail and road and for interchange between these modes of transport.

1.2 DEFINITIONS AND EXPLANATIONS

1.2.1 For the purpose of these Rules:

Container means an article of transport equipment:

of a permanent character and accordingly strong enough to be suitable for repeated use;

specially designed to facilitate the transport of goods by one or more modes of transport without intermediate reloading;

designed to be secured and/or readily handled, and having corner fitting for these purposes;

of a size such that the area enclosed by the four outer bottom corners is at least 14 m^2, or at least 7 m^2 if it is fitted with top corner fittings.

Note. The term "container" includes neither vehicles, nor packaging; however, containers when carried on chassis are included.

Swap body means an article of transport equipment having sufficient strength, designed, normally, for rail and road vehicle transportation on land or by water, having unified dimensions, unified means of securing and handling, and a width and/or a length exceeding those of ISO series 1 containers.

Offshore container means an article of transport equipment having sufficient strength, designed for use in the transport of goods or equipment, capable of being handled in open seas, to, from, and between fixed or floating installations and ships.

Maximum gross mass *R* means the maximum allowable combined mass of the container and its cargo.

Tare mass *T* means the mass of the empty container including permanently affixed ancillary equipment.

Maximum permissible payload *P* means the difference between maximum gross mass *R* and tare mass *T*.

Note. In case when during testing gravitational forces are used the inertial forces of the above values are denoted respectively by: *Rg, Tg, Pg*.

Type of Container means the design type of container complying with requirements of these Rules and approved by the Register.

Type-series container means any container manufactured in accordance with the approved design type.

Prototype means a container representative of those manufactured or intended to be manufactured in a definite design type-series.

Corner fittings mean the structural elements with apertures and faces, arranged at the top and bottom corners of a container for the purposes of handling, stacking and/or securing.

1.3 APPROVAL OF CONTAINERS

1.3.1 "Approval" of containers means the decision of the Register that a design type or an individual container is safe within the terms of the present Rules and is suitable for the transportation of cargoes according to designation.

1.3.2 The container, being manufactured and tested in accordance with the requirements of the present Rules, is considered to be approved under the terms of the International Convention for Safe Containers (CSC) and the Customs Container Convention (CCC).

1.3.3 For approval of container by design type or individually an application in writing shall be submitted to the Register.

1.3.4 The application for approval shall for each design type of container be accompanied by the following documentation:

.1 design or technical specifications of the container with description of its purpose, construction, technical characteristics, mechanical and chemical properties of materials involved, adopted welding procedures as well as methods of assembling, finish and painting;

.2 service instruction for special-purpose containers;

.3 general view drawings, sectional views with scantlings, assemblies and separate elements as well as the materials involved;

.4 test program indicating internal loads and external forces with methods of their application.

Technical documentation, as a rule, shall be submitted in triplicate.

Additional technical documentation may be required by the Register if considered necessary.

1.3.5 A prototype container or an individual container shall be subjected to testing in accordance with these Rules in the presence of a Surveyor to the Register.

Containers tested in accordance with the provisions of ISO document No.1496 are regarded as tested in compliance with the requirements of the CSC Convention.

1.3.6 With satisfactory results obtained in testing and surveying a prototype or an individual container, the Register issues to the applicant a Certificate of Container Safety Approval by Design Type.

1.3.7 The Certificate of Approval shall entitle the Applicant to affix a Safety Approval Plate[1] (see 4.1) to every type-series and individual container, manufactured under supervision of the Register to the approved design type.

1.3.8 The Register may approve for service containers manufactured as modifications of the approved design type, if satisfied that the modifications do not affect the results of tests made in the course of approval by design type.

1.4 SUPERVISION DURING PRODUCTION OF TYPE-SERIES CONTAINERS

1.4.1 At any stage during production of type-series containers to the approved design the Register may examine or test as many units as it considers necessary. The extent of testing and the intervals between tests shall be prescribed by the Register, unless expressly provided in these Rules.

1.5 RECOGNITION OF MANUFACTURERS AND ACCREDITATION OF TEST LABORATORIES

1.5.1 Recognition of manufacturers.

1.5.1.1 Where containers are to be manufactured by design type-series under supervision of the Register, the manufacturers shall submit to the Register the documents showing the work organization, the production methods, the particulars of equipment used for the manufacture and testing of containers, as well as information on existing quality control arrangements ensuring the adequate level and stability of quality of the type-series containers.

1.5.1.2 The basic requirements which will be particularly reviewed during examination of the documents listed in 1.5.1.1 are outlined as follows:

.1 arrangements for introducing modifications approved by the Register into the technical documentation and the manufacturing process and ensuring they are acted upon at the appropriate production stage;

.2 all supplies furnished by sub-suppliers shall be inspected for conformity with technical documentation approved by the Register and for the availability of test certificates of the materials and components of containers;

.3 jigs for verifying dimensional accuracy of containers during repeated use shall be periodically checked by quality control department;

.4 spare parts and expendable materials shall be appropriately stored;

.5 availability at the works manufacturing containers of certificated welders, welding engineer in charge of monitoring the welding procedures, approved welding procedures and qualified personnel engaged in the manufacture of container components and their assembly;

.6 control of final dimensions of the containers shall be provided;

.7 adequate rejection procedure and identification of rejected components and assemblies shall be provided and appropriate records kept;

.8 record of tests and inspections shall be kept for each container;

.9 Quality Manual and internal audit arrangements shall be provided.

1.5.1.3 The manufacturer of type-series containers shall give the assurance to the Register that it will:

.1 produce any of approved design type containers for examination at a request of the Register;

.2 affix the CSC Plate (see Fig.4.1.2) and the emblem of the Register to each container of the design type-series if permitted by the Register;

.3 agree with the Register all changes in the design specifications of the container;

.4 agree with the Register such changes in the container structure which might lead to non-compliance with requirements of the design specifications and the Rules;

.5 in cases mentioned under 1.5.1.3.3 and 1.5.1.3.4 affix the CSC Plate only after the Register's approval of such changes;

.6 keep a record of containers manufactured to the approved design type, which shall at least contain the manufacturer's identification numbers, dates of delivery, names and addresses of customers to whom the containers are delivered;

.7 notify the Register in advance about commencement of the production of each new series of containers manufactured to the approved design type.

1.5.1.4 The Register carries out a survey of the manufacturer and production equipment to ensure that an effective quality control features have been instituted which provide for conformity of type-series containers with the approved prototype.

1.5.1.5 When satisfied with the results of examination of the technical documentation and survey the Register may issue to the manufacturer a Certificate of Recognition confirming technical cap-

[1] Thereinafter called "the CSC Plate".

ability of the manufacturer to produce containers of the approved design type under supervision of the Register.

1.5.2 Accreditation of test laboratories.

1.5.2.1 A test laboratory for testing the containers and/or materials and articles intended for the containers shall be accredited by the Register. To be granted such accreditation the laboratory shall submit to the Register an application in writing. The application shall be accompanied by the following documentation:

.1 general arrangement plan of test station;

.2 description of equipment used by the test station for all kinds of test;

.3 list of gauges having a stamp and/or certificate of competent authority;

.4 types and designations of containers which may be tested;

.5 duration of each test;

.6 details of personnel qualification.

1.5.2.2 The Surveyors to the Register carry out survey of the test laboratory and witness the tests to ensure that the test laboratory is capable of testing according to the test program approved by the Register.

1.5.2.3 When satisfied with the results of the survey the Register issues to the laboratory a Certificate of Accreditation confirming that the test laboratory is capable of performing tests of containers and/or materials and articles intended for the containers under supervision of the Register. No Certificates of Accreditation shall be issued to the manufacturers' laboratories having a Certificate of Recognition.

2 GENERAL TECHNICAL DATA

2.1 DIMENSIONS, RATINGS AND MASS

2.1.1 The dimensions, ratings and mass as well as the specific structural details of the containers shall comply with the international standards or national standards recognized by the Register.

2.1.2 External dimensions and tolerances as well as the maximum gross mass R of the containers of ISO series 1 are shown in Table 2.1.2. The dimensions and tolerances cited correspond to the measurements obtained at a temperature of 20°C; if the measurements are taken at another temperature an appropriate tolerance will be introduced.

For the height and maximum gross mass R shown in Table 2.1.2 deviations may be permitted.

Table 2.1.2

Basic Characteristics of ISO Containers

Designation	Height H, mm	Width W, mm	Length L, mm	Maximum gross mass R, kg	Distance between centres of apertures in corner fittings, mm		K_{1max}, mm	K_{2max}, mm
					S	P		
1AAA	2896^{0}_{-5}	2438^{0}_{-5}	12192^{0}_{-10}	30480	$11985^{+6,5}_{-6,5}$	2259^{+4}_{-4}	19	10
1AA	2591^{0}_{-5}	2438^{0}_{-5}	12192^{0}_{-10}	30480	$11985^{+6,5}_{-6,5}$	2259^{+4}_{-4}	19	10
1A	2438^{0}_{-5}	2438^{0}_{-5}	12192^{0}_{-10}	30480	$11985^{+6,5}_{-6,5}$	2259^{+4}_{-4}	19	10
1AX	< 2438	2438^{0}_{-5}	12192^{0}_{-10}	30480	$11985^{+6,5}_{-6,5}$	2259^{+4}_{-4}	19	10
1BBB	2896^{0}_{-5}	2438^{0}_{-5}	9125^{0}_{-10}	25400	$8918^{+6,5}_{-6,5}$	2259^{+4}_{-4}	16	10
1BB	2591^{0}_{-5}	2438^{0}_{-5}	9125^{0}_{-10}	25400	$8918^{+6,5}_{-6,5}$	2259^{+4}_{-4}	16	10
1B	2438^{0}_{-5}	2438^{0}_{-5}	9125^{0}_{-10}	25400	$8918^{+6,5}_{-6,5}$	2259^{+4}_{-4}	16	10
1BX	< 2438	2438^{0}_{-5}	9125^{0}_{-10}	25400	$8918^{+6,5}_{-6,5}$	2259^{+4}_{-4}	16	10
1CC	2591^{0}_{-5}	2438^{0}_{-5}	6058^{0}_{-6}	2400	$5853^{+4,5}_{-4,5}$	2259^{+4}_{-4}	13	10
1C	2438^{0}_{-5}	2438^{0}_{-5}	6058^{0}_{-6}	2400	$5853^{+4,5}_{-4,5}$	2259^{+4}_{-4}	13	10
1CX	< 2438	2438^{0}_{-5}	6058^{0}_{-6}	2400	$5853^{+4,5}_{-4,5}$	2259^{+4}_{-4}	13	10
1D	2438^{0}_{-5}	2438^{0}_{-5}	2991^{0}_{-5}	10160	2787^{+4}_{-4}	2259^{+4}_{-4}	10	10
1DX	< 2438	2438^{0}_{-5}	2991^{0}_{-5}	10160	2787^{+4}_{-4}	2259^{+4}_{-4}	10	10

2.1.3 No part of the container shall project beyond the external dimensions.

2.1.4 Containers differing in design and dimensions from the requirements set out in this Section are subject to special consideration by the Register in each particular case.

2.2 CORNER FITTINGS

2.2.1 The dimensions and tolerances of corner fittings manufactured to ISO standard No.1161, as well as their relative position in an assembled container are shown in Figs.2.2.1-1, 2.2.1-2, 2.2.1-3 and in Table 2.1.2.

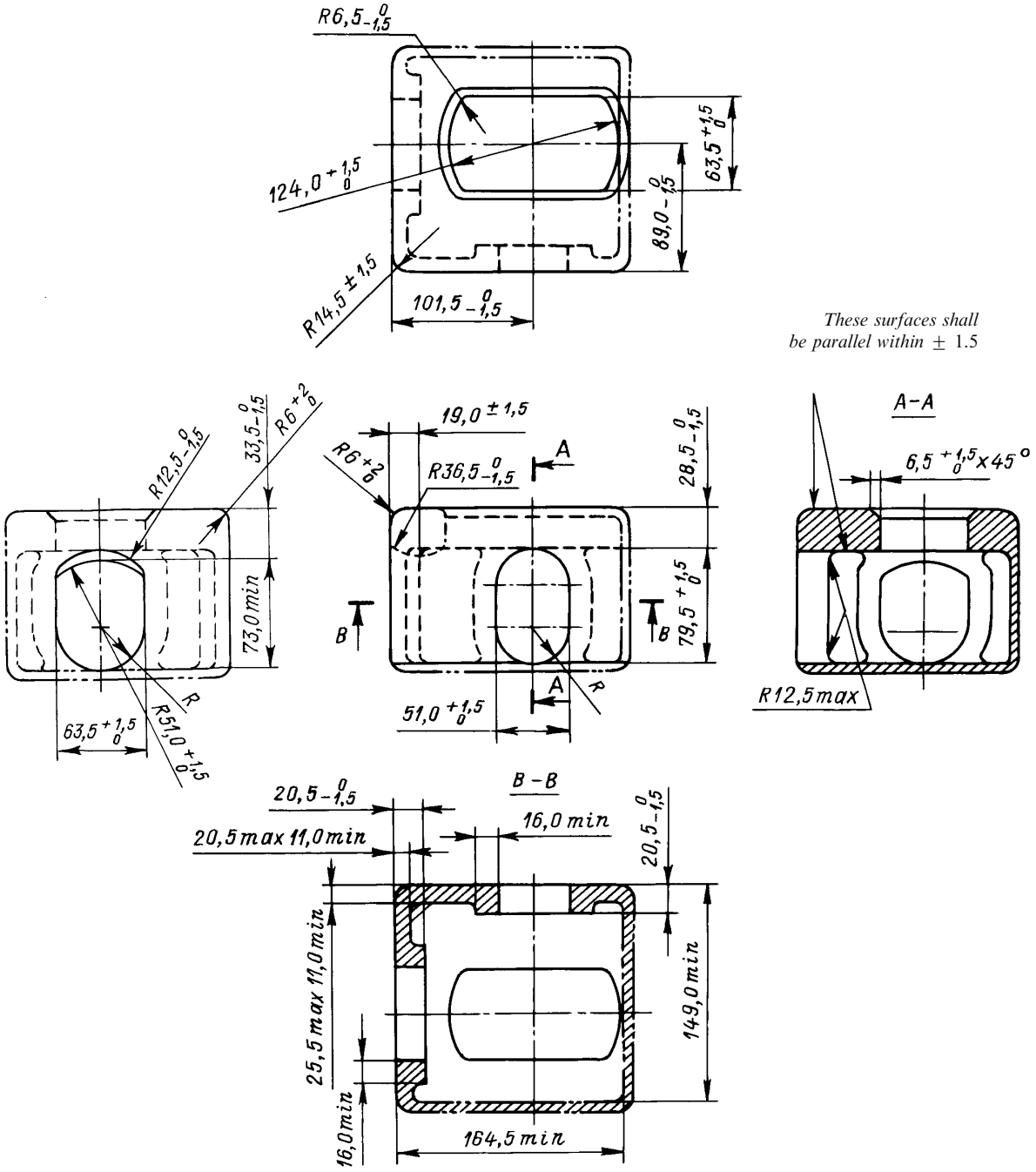


Fig.2.2.1-1 Top corner fitting, mm:

——— , – – – surfaces and contours which must be physically duplicated in the fitting; – · · – · · – optional walls which may be used to develop a box-shaped fitting. The outer and inner edge radii, where sharp corners are shown, shall not exceed 3 mm except as noted in the Figure.

The requirements of this Chapter are applicable only to the corner fittings of containers manufactured to ISO standard No.1496.

2.2.2 The upper faces of the top corner fittings shall protrude above the top of the container by a minimum of 6 mm. By the top of the container the highest point of the container roof is meant with no allowance made for the thickness of corner brackets.

2.2.3 Bottom corner fittings shall be capable of withstanding a load of 150 kN applied normally to the contact area of 25 + 6 mm on the bottom face (Fig. 2.2.3).

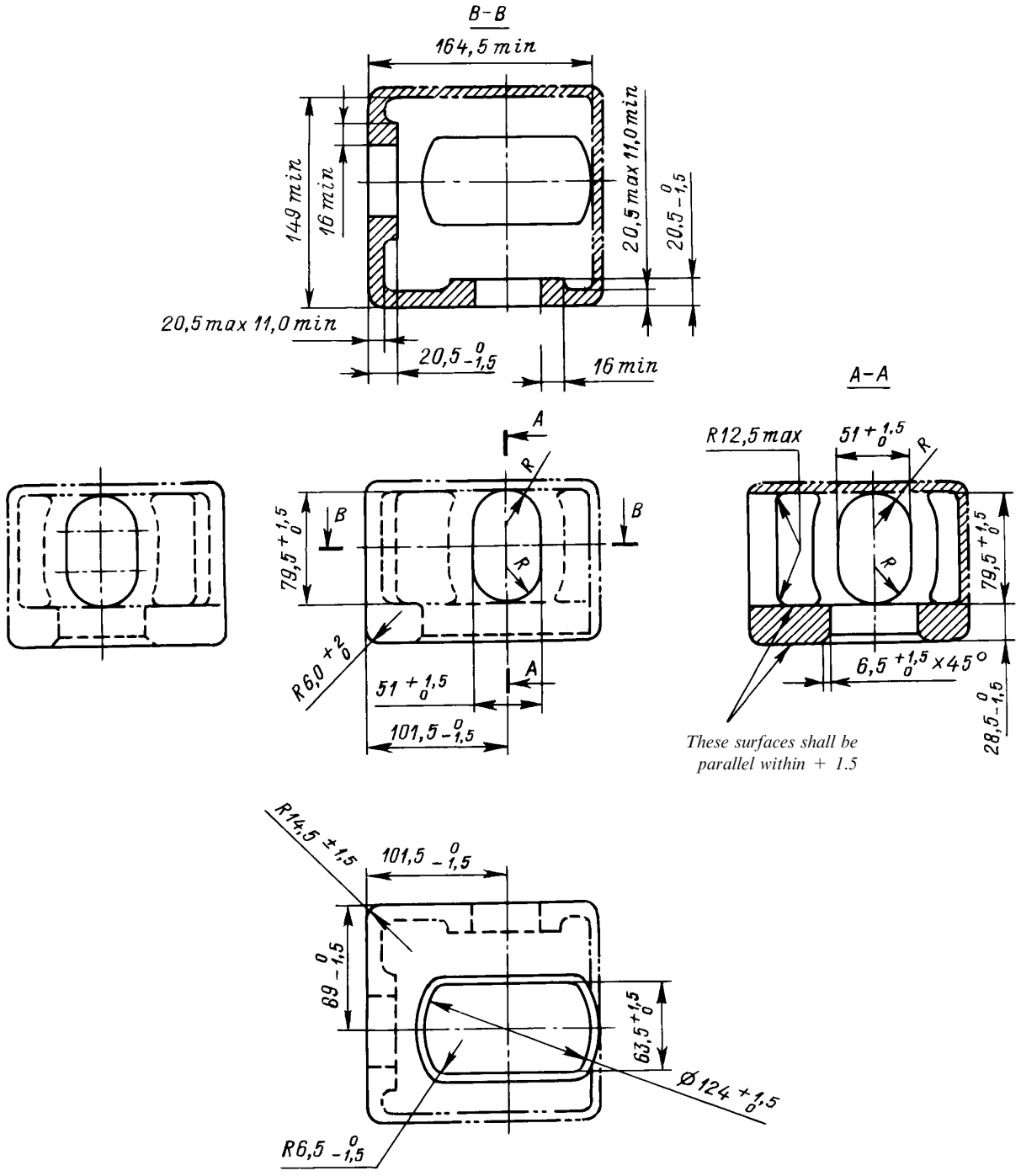


Fig.2.2.1-2 Bottom corner fitting, mm:

——— , _ _ _ _ surfaces and contours which must be physically duplicated in the fitting; _ . . _ . . _ optional walls which may be used to develop a box-shaped fitting. The outer and inner edge radii, where sharp corners are shown, shall not exceed 3 mm except as noted in the Figure.

2.2.4 Corner fittings of the containers shall be capable of withstanding the following loads resulting from the requirements of ISO documents Nos.1496-1 and 1161:

.1 stacking:

top corner fitting — 848 kN (with test corner fitting or pad offset 25,4 mm laterally and 38 mm longitudinally);

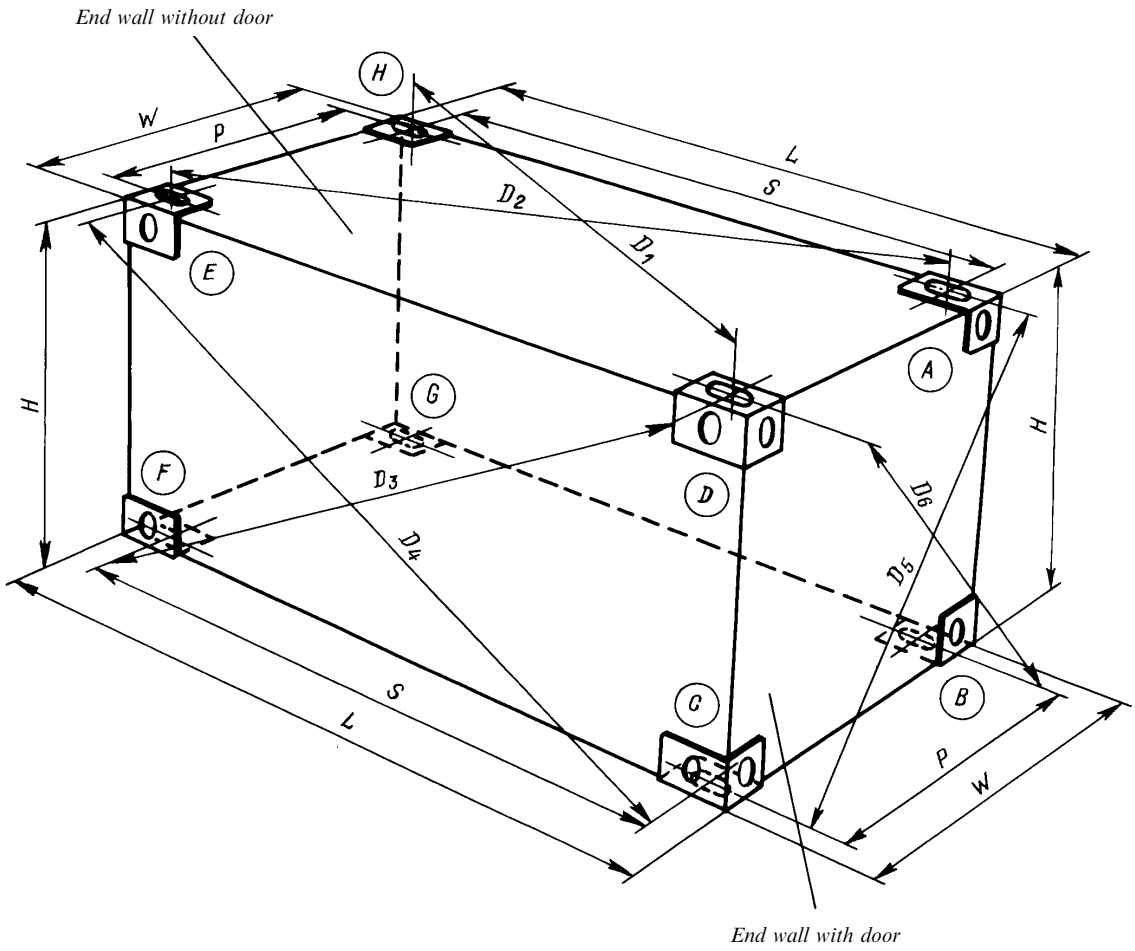


Fig.2.2.1-3 Assembled corner fittings position:
L — external length of the container; W — external width of the container; H — overall height; S — length between centres of apertures in corner fittings; P — width between centres of apertures in corner fittings; D — distance between centres of apertures (or projected reference points therefrom) of diagonally opposite corner fittings resulting in six measurements: D_1, D_2, D_3, D_4, D_5, D_6; K_1 — difference between D_1 and D_2 or between D_3 and D_4 (i.e. $k_1 = D_1 — D_2$ or $K = D_8 — D_9$); K_2 — difference between D_5 and D_6 (i.e. $K_2 = D_5 — D_6$).
Letters shown in circles serve for reference when dealing with documentation

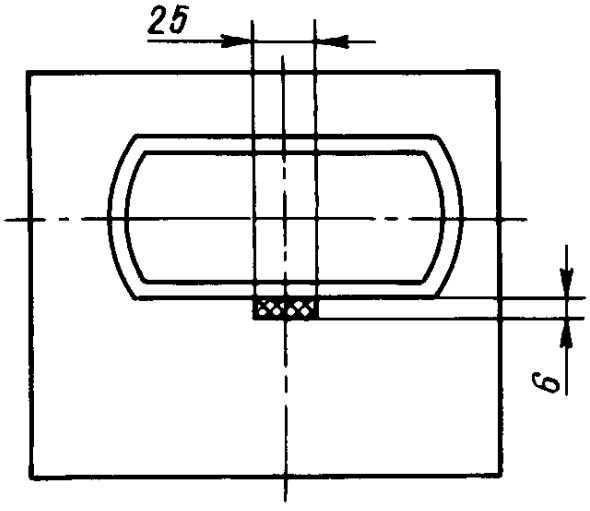


Fig. 2.2.3 Bottom corner fitting (view from below)

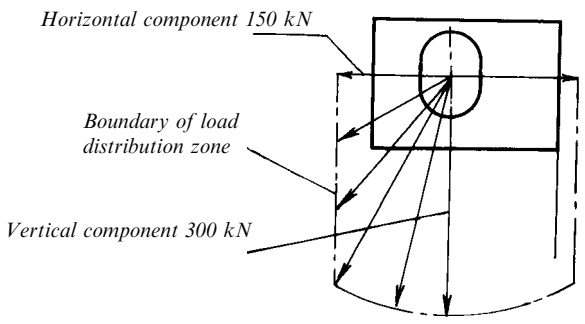


Fig. 2.2.4.4 Scheme of load application from securing of containers

bottom corner fitting of the lowermost container in stack (resting on flat support) — 954 kN;

bottom corner fitting of the next to the lowermost container in stack (its offset with respect to the lowermost container being 25,4 mm laterally and 38 mm longitudinally) — 848 kN;

.2 lifting:

top corner fitting — 150 kN;

bottom corner fitting (slung at 30° to horizontal) — 300 kN;

.3 longitudinal restraint: bottom corner fittings (two fittings carrying load) — 300 kN on each fitting;

.4 lashing and securing: front and side apertures of both top and bottom fittings — 300 kN vertically and 150 kN horizontally on each fitting, both forces acting in a plane parallel to the fitting front and side faces, at a distance not exceeding 38 mm from the faces. The maximum resultant load due to combined vertical and horizontal components shall not exceed the values indicated in Fig. 2.2.4.4.

2.2.5 Each fitting manufactured under the supervision of the Register shall be marked on the inside. As a minimum, the marking shall contain the following data: Manufacturer's mark, heat number, the Register abbreviation (RS). The marking may be cast on the fitting.

2.3 BASE STRUCTURE

2.3.1 Under conditions of dynamic and static tests with the container having a uniformly distributed internal load such that the combined mass of container and test load is equal to 1,8 *R*, no part of its base shall deflect by more than 6 mm below the base plane (bottom faces of bottom corner fittings). Under conditions of static loads with the container having a uniformly distributed internal load *P*, no part of its base shall protrude beyond the plane formed by bottom faces of bottom corner fittings.

2.3.2 Containers 1AAA, 1AA, 1A, 1AX, 1BBB, 1BB, 1B, 1BX, 1CC, 1C and 1CX shall have load transferring areas in their base structure to permit vertical load transfer when carried on chassis.

2.3.2.1 The distance between lower faces of load transferring areas and the base plane (bottom faces of the bottom corner fittings) shall be $12{,}5^{+5}_{-1{,}5}$ mm.

2.3.2.2 The load transferring areas of a cross-member with chassis shall cover zones of not less than 250 mm in width, not less than 25 mm in length and be located as shown in Fig. 2.3.2.2.

2.3.2.3 Maximum load on the zones shall not exceed 2*R*.

2.3.2.4 The load transferring areas shall be so arranged as to provide sufficient contact with chassis at:

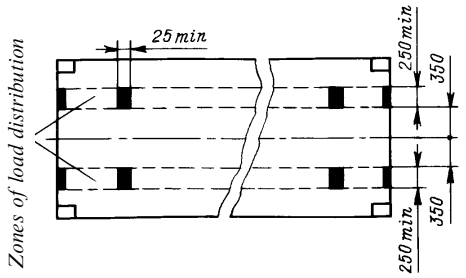


Fig. 2.3.2.2 Zones of load distribution, mm

.1 bottom end rails and cross-members spaced at intervals of 1000 mm or less;

.2 bottom end rails and cross-members, as well as gooseneck tunnel, at least, as shown in Figs. 2.3.2.4.2-1 to 2.3.2.4.2-4.

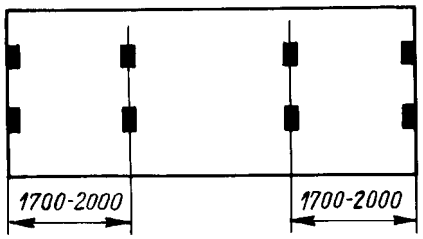


Fig. 2.3.2.4.2-1 Load transferring areas (in 1CC, 1C and 1CX containers)

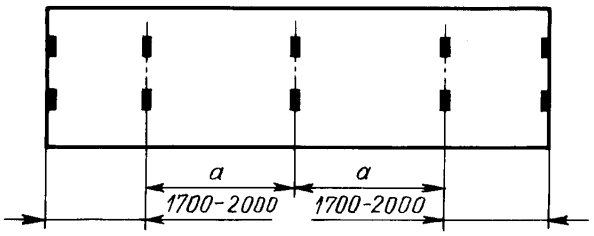


Fig. 2.3.2.4.2-2 Load transferring areas (in 1BBB, 1BB, 1B and 1BX containers)

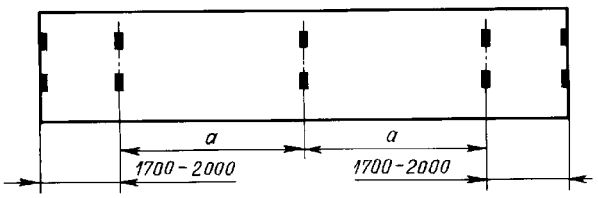


Fig. 2.3.2.4.2-3 Load transferring areas (in 1AAA, 1AA, 1A and 1AX containers without gooseneck tunnel)

2.3.3 All containers shall be so constructed that they can rest only on the bottom corner fittings.

2.3.4 1AAA, 1AA, 1A, 1AX, 1BBB, 1BB, 1B, 1BX, 1CC, 1C and 1CX containers shall be, moreover, so constructed that they can rest only on the load transferring area in their base structure when carried on chassis.

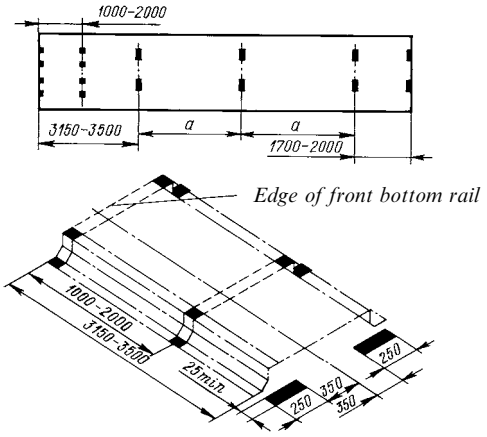


Fig. 2.3.2.4.2-4 Load transferring areas
(in 1AAA, 1AA, 1A and 1AX containers with gooseneck tunnel)

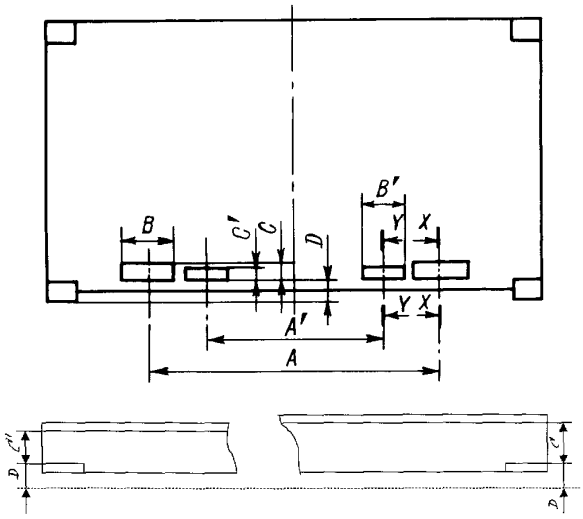


Fig. 2.6.1.1 Position and dimensions of fork lift pockets

2.4 END STRUCTURE

2.4.1 For 1AAA, 1AA, 1A, 1AX, 1BBB, 1BB, 1B, 1BX, 1CC, 1C and 1CX containers sideways deflection of the top with respect to the bottom of container while under full transverse racking test condition shall not cause the sum of the changes in length of diagonals D_5 and D_6 (see Fig. 2.2.1-3), to exceed 60 mm.

2.5 SIDE STRUCTURE

2.5.1 For 1AAA, 1AA, 1A, 1AX, 1BBB, 1BB, 1B, 1BX, 1CC, 1C and 1CX containers the longitudinal deflection of the top with respect to the bottom of container while under full longitudinal racking test condition shall not exceed 25 mm.

2.6 OPTIONAL STRUCTURES

2.6.1 Fork lift pockets.

2.6.1.1 Fork lift pockets may be provided for 1CC, 1C, 1CX, 1D and 1DX containers; no pockets shall be provided for tank containers.

Position and dimensions of pockets are shown in Fig. 2.6.1.1.

2.6.1.2 The fork pockets shall be cut in the bottom side rails from either side. The length of pocket is to be equal to the width of container.

2.6.2 Provision for handling by means of grappler arms or similar devices.

2.6.2.1 Areas for handling the containers by means of grappler arms or similar devices may be provided for all containers.

Position and dimensions of lifting areas for grappler arms are shown in Fig.2.6.2.1.

2.6.3 Gooseneck tunnel.

2.6.3.1 Gooseneck tunnel may be provided only for 1AAA, 1AA, 1A and 1AX containers.

Position and dimensions of the tunnel are shown in Fig. 2.6.3.1.

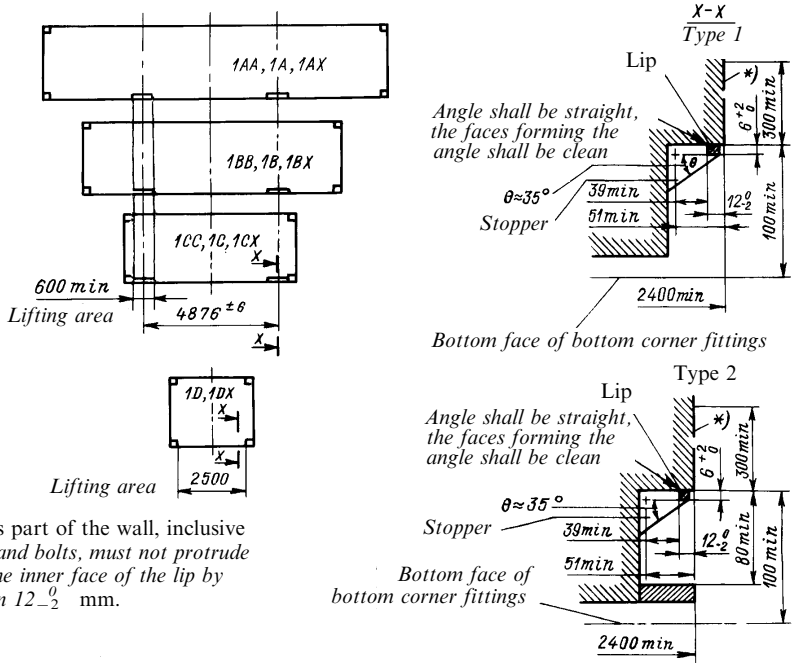
The provision of tunnel shall not preclude fulfilment of requirements specified for the base structure under 2.3.

2.6.4 Cargo securing devices.

Devices for securing container cargo may be used in the container in addition to props and struts to prevent cargo shifting within the container when transported. Cargo securing devices may be placed both on the base structure itself and above it. Number of devices placed on the base frame will be:

for 1AAA, 1AA, 1A and 1AX containers — 16,
for 1BBB, 1BB, 1B and 1BX containers —12,
for 1CC, 1C and 1CX containers — 10,
for 1D and 1DX containes — 8.

Designation of container	Dimensions and tolerances, mm						
	Pockets for loaded and empty container				Pockets for empty container only		
	A	B	C	D	A′	B′	C′
ICC, IC, ICX, ID, IDX	2050 ± 50 900 ± 50	355 min. 305 min.	115 min. 102 min.	20 min. 20 min.	900 ± 50	305 min.	102 min.



7. *) This part of the wall, inclusive of rivets and bolts, must not protrude beyond the inner face of the lip by more than 12^{0}_{-2} mm.

Fig. 2.6.2.1 Position of grappler arm lifting areas, dimensions (in mm) and design of grappler arm platforms

Provision of the cargo securing devices shall not be regarded as a ground for reducing the minimum dimensions of the door openings in the container.

2.6.5 Automatic electronic identification (AEI) equipment.

In the case of a container fitted with automatic electronic identification (AEI) equipment, this equipment shall comply with the requirements of ISO 10374.

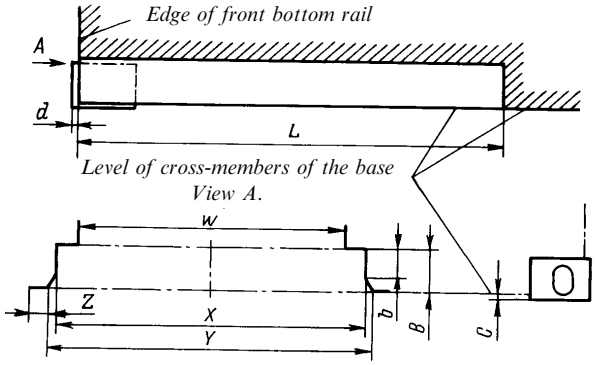


Fig. 2.6.3.1 Position and dimensions of gooseneck tunnel

Length	*L*	3150 - 3500
	d	6^{+1}_{-2}
Width	*W*	930 max
	X	1029^{+3}_{0}
	Z	25 min
	Y	1070 min
		1130 max
Height	B^{1}	120^{0}_{-3}
	b	35 min
		70 max
	c	$12.5^{+5}_{-1,5}$

[1] The *B* tolerance should be measured in the rear part of the tunnel on a length of about 600 mm.

3 MATERIALS AND WELDING

3.1 GENERAL

3.1.1 The materials used for the manufacture of containers shall satisfy requirements of these Rules, national standards and international rules agreed with, and recognized by the Register, normative-methodical instructions of the Register, as well as the requirements of technical documentation approved by the Register.

3.1.2 Depending on the design type and operating conditions of the container requirements for materials set forth in the relevant parts of the Rules for the Classification and Construction of Sea-Going Ships (Part X "Boilers, Heat Exchangers and Pressure Vessels", Part XIII "Materials" and Part XIV "Welding") and the Rules for the Classification and Construction of Gas Carriers (Part IX "Materials and Welding") may be also applicable to a reasonable extent.

3.1.3 The materials used shall have assured properties (strength, toughness, weldability, resistance to corrosion failures etc.) to ensure failure-free performance of the structure under service conditions specified in the technical documentation approved by the Register.

3.1.4 When selecting composition of a material for the bearing structures of the container (framework, tank) it is necessary to take into account the range of working temperatures (ambient temperatures) likely to be encountered on the operational routes, which run across the areas with the most unfavourable conditions. In any case resistance of the material to brittle and corrosion failures within the temperature range from —40 to +50°C must be assured.

Other ranges of the operating temperatures, depending on the climatic version of construction specified in the design, may be adopted subject to agreement with the Register and customer.

3.1.5 In the course of operation the container owner is responsible for the use of container in the specified climatic zone.

3.1.6 Where stated in the appropriate parts of these Rules, materials used for manufacture of containers shall be manufactured under supervision of the Register.

3.1.7 Special requirements specifying mechanical characteristics and selection of the material depending on operating conditions, design type of the container and kind of the cargo carried are set forth in the appropriate parts of these Rules, Rules for the Classification and Construction of Sea-Going Ships, Rules for the Classification and Construction of Gas Carriers, Regulations for the Transportation of Dangerous Goods by Sea.

3.1.8 Materials used in manufacture of containers shall not affect adversely each other and shall be adequately insulated, if necessary.

3.2 MATERIALS FOR FRAMEWORK ELEMENTS

3.2.1 The corner fittings may be manufactured by casting or other technique approved by the Register.

3.2.2 The corner fittings shall be manufactured at works recognized by the Register. Recognition is received on the basis of the results of survey and testing of the corner fittings under program agreed with the Register.

3.2.3 Requirements to the procedure for survey of the manufacturers of fittings, test extent in the course of approval and supervision during series production, as well as for approval of manufacture techniques other than casting and material compositions other than those indicated below, are set forth in the appropriate section of the Guidelines on the Supervision of Containers Under Manufacture.

3.2.4 The material of the corner fittings manufactured by casting shall meet the following requirements:

.1 chemical composition of steel shall comply with the requirements of Table 3.2.4.1.

.2 mechanical properties of the castings shall comply with the requirements of Table 3.2.4.2. Test specimens may be taken either from the cast corner fitting or from a separately cast sample;

.3 the indicated mechanical properties shall be consistent with the properties of castings after heat treatment according to procedures given in the agreed specification.

3.2.5 To manufacture the framework elements (rails, posts, supports etc.) carbon steel, carbon-manganese steel, carbon-manganese microalloy steel and low-alloy steel meeting requirements of Table 3.2.7 may be used.

3.2.6 Chemical composition of material, heat treatment, weldability shall comply with the requirements of national and international standards agreed with or recognized by the Register, as well as with operating conditions specified during designing of the container.

3.2.7 Depending on the yield stress values grades of steel are determined in accordance with Table 3.2.7.

Table 3.2.4.1

Chemical Composition (from the results of ladle analysis)

C, max	Mn	Si, max	P, max	S, max	Cr, max	Ni, max	Cu, max	Mo, max	Al, min	Cr + Ni + Cu + Mo, max
0,20	0,90 — 1,50	0,50	0,035	0,035	0,25	0,30	0,20	0,08	0,015	0,70

Notes:

1. Castings shall be manufactured in electric furnaces or by oxygen-converter or other process subject to agreement with the Register, and steel must be killed.

2. The carbon equivalent calculated by the formula: $C_{eq} = C + Mn/6 + (Cr + Mo + V)/5 + (Ni + Cu)/15$ shall not exceed 0,45%.

3. Aluminium may be partially or totally replaced by other grain refining elements according to approved specification.

Table 3.2.4.2

Mechanical Properties

Yield stress R_{eH}, N/mm^2, min	Tensile strength R_m, N/mm^2	Elongation A_5, %, min	Reduction of area Z, %, min	Impact energy KV [1], J, min at temperature, °C, min of	
				-20	-40[2]
220	430-600	25	40	27	21

[1] Average value obtained at testing three sharp-notch specimens in accordance with 2.2.3, Part XIII "Materials" of the Rules for the Classification and Construction of Sea-Going Ships. The value of impact energy determined on one test specimen may be less than that given in the Table but in any case it shall not be less than 70% of the tabulated value.

[2] Test at lower temperature may be carried out at the request of the customer with due regard for the climatic design version of the article.

where E is the average value of impact energy obtained on standard specimens measuring 10×10 mm.

3.2.9 The framework elements may be made of hull structural steel of normal and higher strength in accordance with Part XIII "Materials" of the Rules for the Classification and Construction of Sea-Going Ships, national and international standards agreed with and recognized by the Register, provided the requirements of Table 3.2.7 are complied with.

3.2.10 Where aluminium alloys are used for the construction of frame and corner fittings of containers, the mechanical properties and the scope of testing, required for aluminium alloys, shall be specially considered by the Register in each particular case.

Table 3.2.7

Steel grade	Yield stress R_{eH}, N/mm^2, min.	Tensile strength Rm, N/mm^2, min.	Elongation, A5, $5{,}65\sqrt{S_0}$, %, min.	Impact energy KV, J, at working temperature on V-notched specimens
27	265	430	21	27 on transverse specimens for plates; 41 on longitudinal specimens for bars and structural shapes
30	295	430	21	
32	315	450	21	
35	345	490	21	
40	390	510	20	

Note. Impact testing of material of 5 mm in thickness and less is not required.

3.2.8 When selecting material for the framework elements consideration must be given to the requirements set out in 3.1.4, to provide an assured impact energy value at the working temperature, which shall not be lower than the average value of 27 J obtained at testing three standard specimens measuring 10×10 mm, with sharp V-notch, to be cut transverse to the final direction of rolling of the material used. If the thicknesses of the material under test are less than 10 mm, the following average values of impact energy are taken:

for specimens measuring $10 \times 7{,}5$ mm — $5E/6$, i.e. 22 J;

for specimens measuring $10 \times 5{,}0$ mm — $2E/3$, i.e. 18 J,

3.3 MATERIALS FOR TANK CONTAINER VESSELS

3.3.1 Materials used in the manufacture of tank container vessels, piping, manholes and their covers, flanges, fittings, safety devices along with the materials used for their attachment, shall withstand the temperatures, the pressure produced by the goods carried and their vapours under the operating conditions, and be immune to attack by the goods transported and their vapours, with regard to the corrosion allowances (if applicable), or shall be passivated or neutralized by chemical reaction, or lined with corrosion-resistant material.

3.3.2 Depending on the type of tank container, kind of cargo carried and operating conditions, use may be made of carbon-manganese microalloy steel, low-alloy steel, territic-austenitic steel, austenitic steel, aluminium alloys.

3.3.3 Chemical composition of the materials and their mechanical properties shall meet the requirements of national standards and international rules agreed with and recognized by the Register. Steel shall be approved by the Register for appropriate operating conditions and working temperature.

3.3.4 The materials involved may be used within the minimum design temperature range in accordance with Table 3.3.4.

Table 3.3.4

Groups of steels	Minimum design temperature, °C
Carbon-manganese, microalloy, totally deoxidized (normalized or tempered and quenched) steel	-45
Ferritic-austenitic steel with nickel content, %:	
0,5	-55
1,5	-60
3,5	-90
5 9	-105
Austenitic steel	-165
Aluminium alloys	-165

3.3.5 The minimum value of impact energy obtained at testing V-notched specimens at the minimum operating temperature shall not be less than 27 J for transverse specimens and 41 J for longitudinal specimens. If the thickness of material is less than 5 mm the said tests are not required.

3.3.6 Materials used for manufacture of tank containers intended for carriage of liquified gas shall in addition comply with the requirements of Part IX "Materials and Welding" of the Rules for the Classification and Construction of Gas Carriers.

3.3.7 Steels used for the manufacture of tank container vessels intended for the transportation of dangerous goods, as well as welded-in flanges, manholes and their covers, shall have a yield strength/tensile strength ratio of not more than 0,85.

3.4 WOOD

3.4.1 Sawn timber shall be of sufficient strength, with no sap, cracks and loose knots, and with moisture content not over 18%.

3.4.2 Plywood shall be manufactured of durable timber, with layers of veneer glued together by efficient waterproof adhesives resistant to ageing affects so that laminations will not occur if wetted.

3.4.3 The preserving means used for treatments and impregnation of timber shall have no adverse effect on the cargoes carried in containers.

3.5 PLASTICS

3.5.1 The plastics used for the construction of containers shall be specially considered by the Register in each particular case.

3.6 SEALING MATERIALS

3.6.1 Rubber and other sealing materials used for the sealing of doors shall be elastic, durable and stable to mechanical wear under changes of ambient temperature encountered in service conditions of a container, and shall be also resistant to deteriorative action of sea water.

3.7 WELDING

3.7.1 The welding consumables used for construction of containers shall be approved by the Register and meet the requirements of standards agreed with or recognized by the Register.

3.7.2 The technological procedures of welding used during manufacture of container elements shall be approved by the Register, based on the tests performed at the works manufacturing the containers under a program approved by the Register on completion of which Welding Procedure Approval Test Certificates (form 7.1.33) are issued.

3.7.3 Welding operations at the works manufacturing the containers shall be performed by certified welders Having Welder Approval Test Certificate under Form 7.1.30.

3.7.4 For welding of bearing structures of the framework and for welding of tank, use shall be made of welding consumables with cointrollable diffusible hydrogen content according to Part XIV "Welding" of the Rules for the Classification and Construction of Ses-Going Ships.

3.7.5 Welded joints of the vessel shell with manholes, branches and tanks shall be made with full penetration.

3.7.6 Inspection of welded joints of the containers, including vessels of the tank containers, shall meet the requirements of Part XIV "Welding" of the Rules for the Classification and Construction of Sea-Going Ships, the national standards agreed with and

recognized by the Register, as well as the technical documentation approved by the Register.

3.7.7 During construction of the tank containers intended for the carriage of liquified gas consideration must be in addition given to the requirements for welding and nondestructive inspection of welded joints, set forth in Part IX "Materials and Welding" of the Rules for the Classification and Construction of Gas Carriers.

4 MARKING

4.1 THE CSC PLATE

4.1.1 The CSC Plate shall be permanently affixed to every container of the approved design type-series or to a container approved individually.

4.1.2 The CSC Plate shall bear the following particulars in the English language (Fig. 4.1.2):

Safety Approval According to CSC
.1 .....;
.2 date of manufacture;
.3 identification number;
.4 maximum operating gross mass ..... kg ..... lbs;
.5 allowable stacking load for 1,8 g ..... kg ..... lbs;
.6 transverse racking test force ..... newtons;
.7 .....;
.8 .....;
.9 .....;

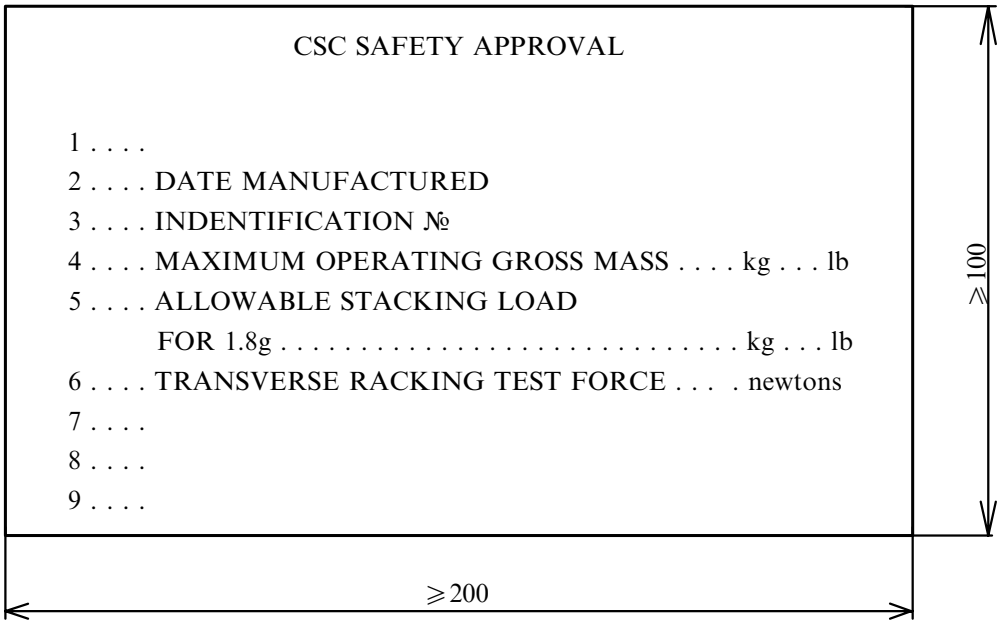


Fig. 4.1.2 The CSC Plate

Notes: **1.** The country of approval shall be indicated by means of a distinguishing sign used to indicate the country of registration of motor vehicles in international road traffic. The approval reference shall include the number and the date (day, month and year) of issue of the Approval Certificate.

2. The date of manufacture is the month and year of manufacture.

3. The identification number is the number assigned to the container by the manufacturer.

4. Maximum operating gross mass is the maximum allowable gross mass *R*.

5. Allowable stacking load for 1,8 g.

6. Transverse racking test force.

7. End wall strength is indicated on the plate if the end walls are designed to withstand a load of less or greater than 0,4P.

8. Side wall strength is indicated on the plate if the side walls are designed to withstand a load of less or greater than 0,6P.

9. The dates of examinations are the first maintenance examination date (month and year), as well as the dates (month and year) of subsequent maintenance examinations. The interval between the date of manufacture and the date of the first maintenance examination shall not exceed 5 years.

A blank space shall be reserved on the plate for indication of survey date and stamping.

4.1.3 The CSC Plate shall be a plate of rectangular shape measuring at least 200 by 100 mm.

The height of letters for the title (see Fig.4.1.2) of the plate shall be at least 8 mm. The height of all other letters and figures shall be not less than 5 mm.

The title and particulars of the CSC Plate shall be stamped into, embossed on, or indicated on its surface in any other permanent and legible way.

Any letters and figures placed on the plate to those already available, shall be of a minimum height 5 mm, stamped into, embossed on, or indicated in any other permanent and legible way.

4.1.4 The CSC Plate shall be made of durable, non-corrosive and fire-proof material providing legible impression of the Register's stamp and survey date.

4.1.5 The CSC Plate shall be permanently affixed to the container at a readily visible place where it would not be easily damaged.

4.1.6 Consolidated Data Plate (see Fig. 4.1.6) bearing, as a minimum, particulars in accordance with 4.1.2 of this section and 3.1.2 of the Rules for Approval of Containers for the Transport of Goods Under Customs Seal, as well as particulars in accordance with other international and national requirements may be used instead of several individual plates.

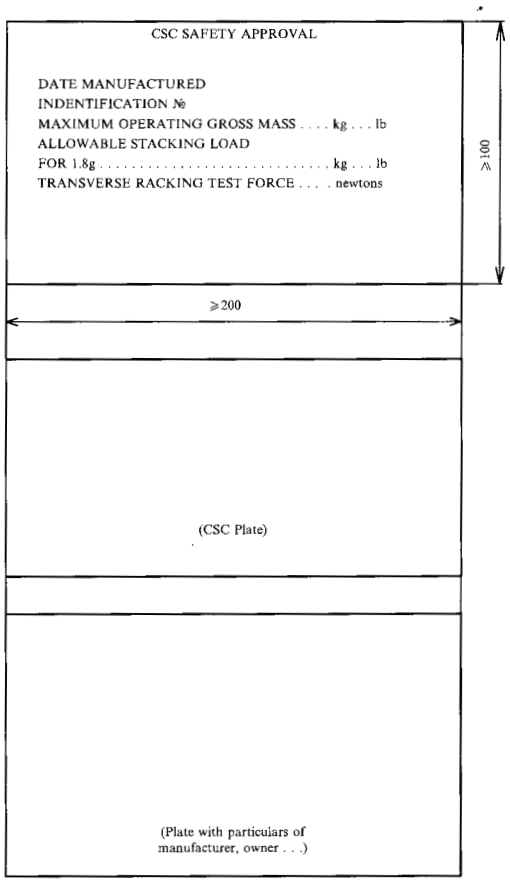


Fig. 4.1.6 Consolidated Data Plate

4.2 ADDITIONAL MARKING

4.2.1 In addition to the CSC Plate the container shall bear the due form of the Register emblem and at least the following inscriptions and indications:

.1 the code of container type and size;

.2 the warning symbol of the risk of electric shock (for the containers fitted with ladders);

.3 the code of the owner, the number, given by the owner and reference number;

.4 gross mass and tare mass of the container. The gross mass shall correspond to that indicated on the CSC Plate and the tare mass — to the actual mass obtained by weighing of the prototype container, unless otherwise stated in the Rules;

.5 symbol of the container height (for the containers over 2,6 m in height);

.6 marking containing the "ACEP" index if the container is operated under the Approved Continuous Examination Program.

4.2.2 The inscriptions indicated in 4.2.1 shall be painted in a colour well contrasting with the painting of container. The letters and figures shall be not less than 100 mm in height and not less than 10 mm in width, except that the gross mass and tare mass shall have the figures of not less than 50 mm in height.

The inscriptions may be painted or applied by means of material with a glue film.

4.2.3 If a container is fitted with special arrangements intended for use solely when the container is empty (e.g. fork lift pockets used for lifting and transporting an empty container), inscriptions notifying of this restriction shall be made in painting alongside the arrangements.

The inscriptions shall be made in the English language; inscriptions in other languages are also permitted.

4.2.4 For special-purpose containers requirements for the additional marking are, moreover, set forth in the relevant Parts of the Rules.

4.2.5 When the containers are surveyed under the periodical survey scheme, the dates of subsequent surveys of the container, shown on the CSC Plate, may be marked on the container sides in a definite color for every year:

brown — 1986, 1992, 1998;
blue — 1987, 1993, 1999;
yellow — 1988, 1994, 2000;
red — 1989, 1995, 2001;
black — 1990, 1996, 2002;
green — 1991, 1997, 2003, etc.

PART II. GENERAL CARGO CONTAINERS

1 GENERAL

1.1 APPLICATION

1.1.1 The provisions of the present Part of the Rules apply to containers for general cargo.

1.1.2 The general cargo containers shall comply with the requirements of Part I "Basic Requirements" and the present Part of the Rules.

1.1.3 The general cargo containers differing in design and dimensions from requirements set out in Section 2 of this Part, including swap bodies and offshore containers, are subject to special consideration by the Register in each particular case.

1.2 DEFINITIONS AND EXPLANATIONS

1.2.1 The definitions and explanations referring to general terms of the Rules are given in Part I "Basic Requirements".

For the purpose of this Part, the following definitions apply:

g e n e r a l c a r g o c o n t a i n e r means a container used for the transport and storage of a number of unit load, packages and bulk material.

Structural elements of a general cargo container are given in Figs.1.2.1-1 — 1.2.1-5.

o p e n t o p c o n t a i n e r means a container similar in all respects to the general purpose container, but that has no rigid roof and may have a flexile or removable roof or cover, made e. g. of canvas or plastic or reinforced plastic material, supported on movable or removable roof bows. An open top container may have a movable or removable rear top rail.

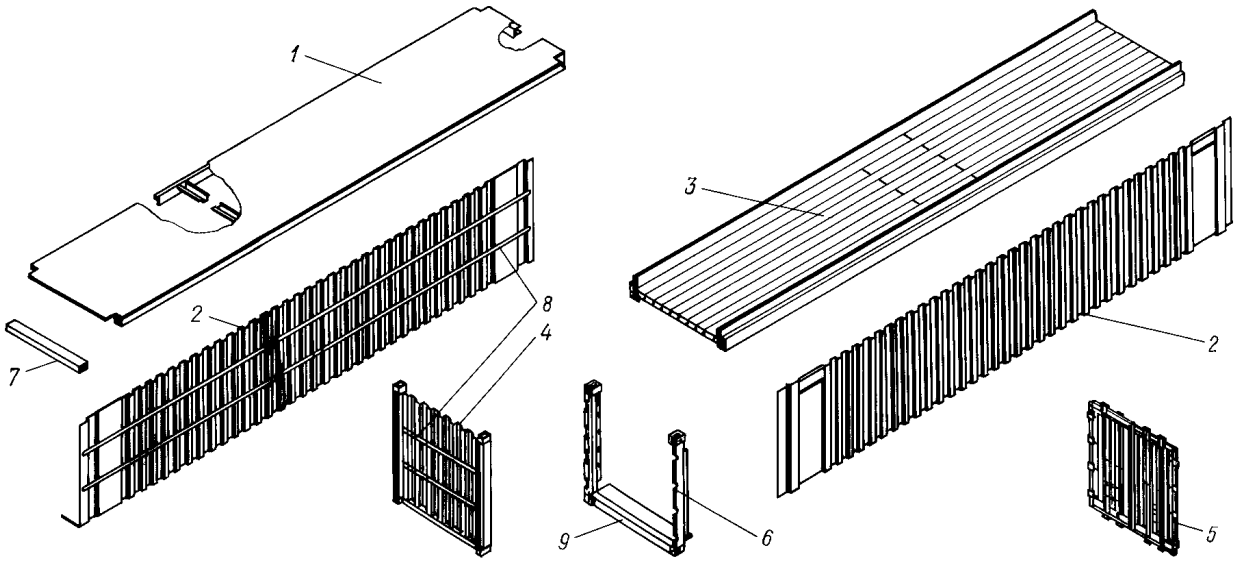


Fig.1.2.1-1 Structural elements of general cargo containers:
1 — roof; *2* — side wall; *3* — base; *4* — front wall; *5* — door; *6* — rear corner post; *7* — rear top rail;
8 — cargo securing arrangements; *9* — rear bottom rail

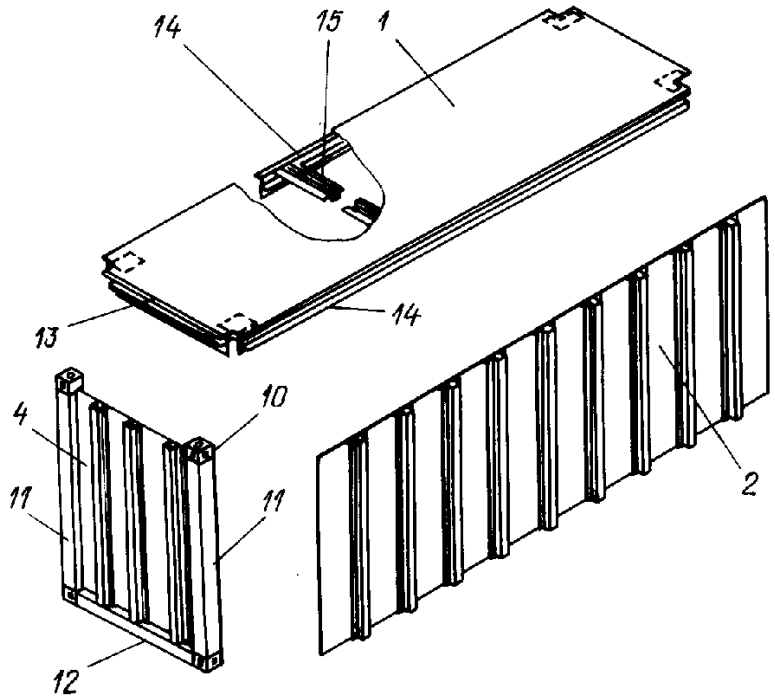


Fig.1.2.1-2 Structural elements of general cargo containers:
1,2,4 — see Fig.1.2.1-1; *10* — corner fitting; *11* — front corner post; *12* — front bottom rail; *13* — front top rail; *14* — top side rail; *15* — roof cross member

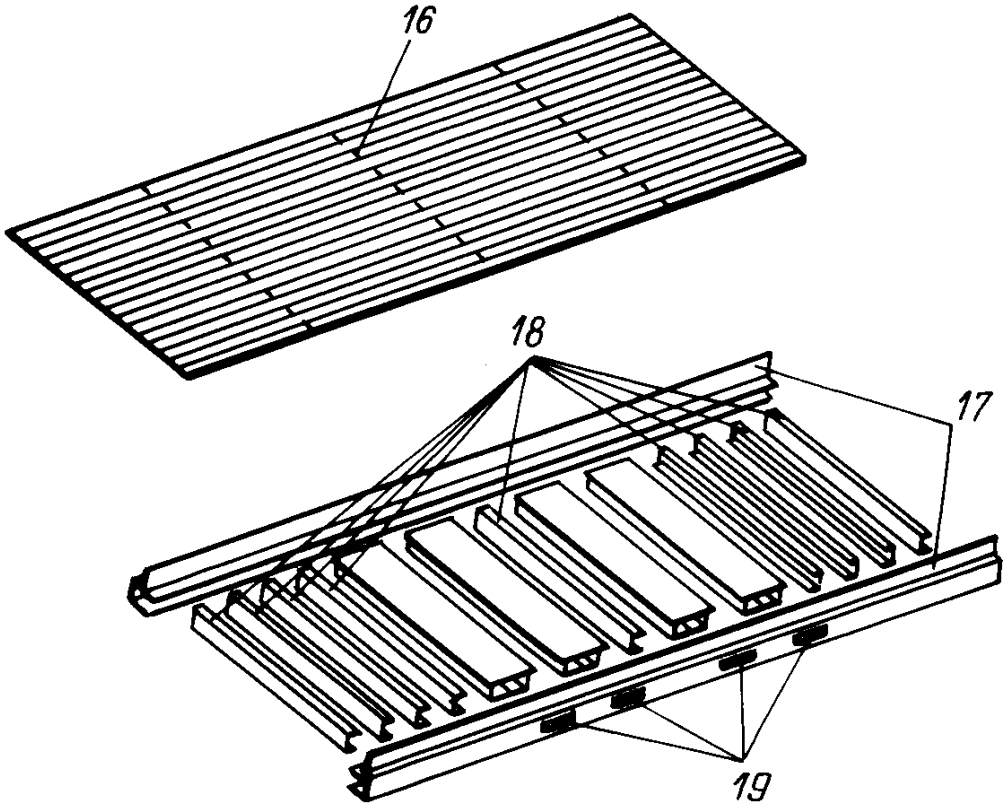


Fig.1.2.1-3 Structural elements of general cargo containers:
16 — floor; *17* — bottom side rail; *18* — bottom cross-member; *19* — fork lift pockets

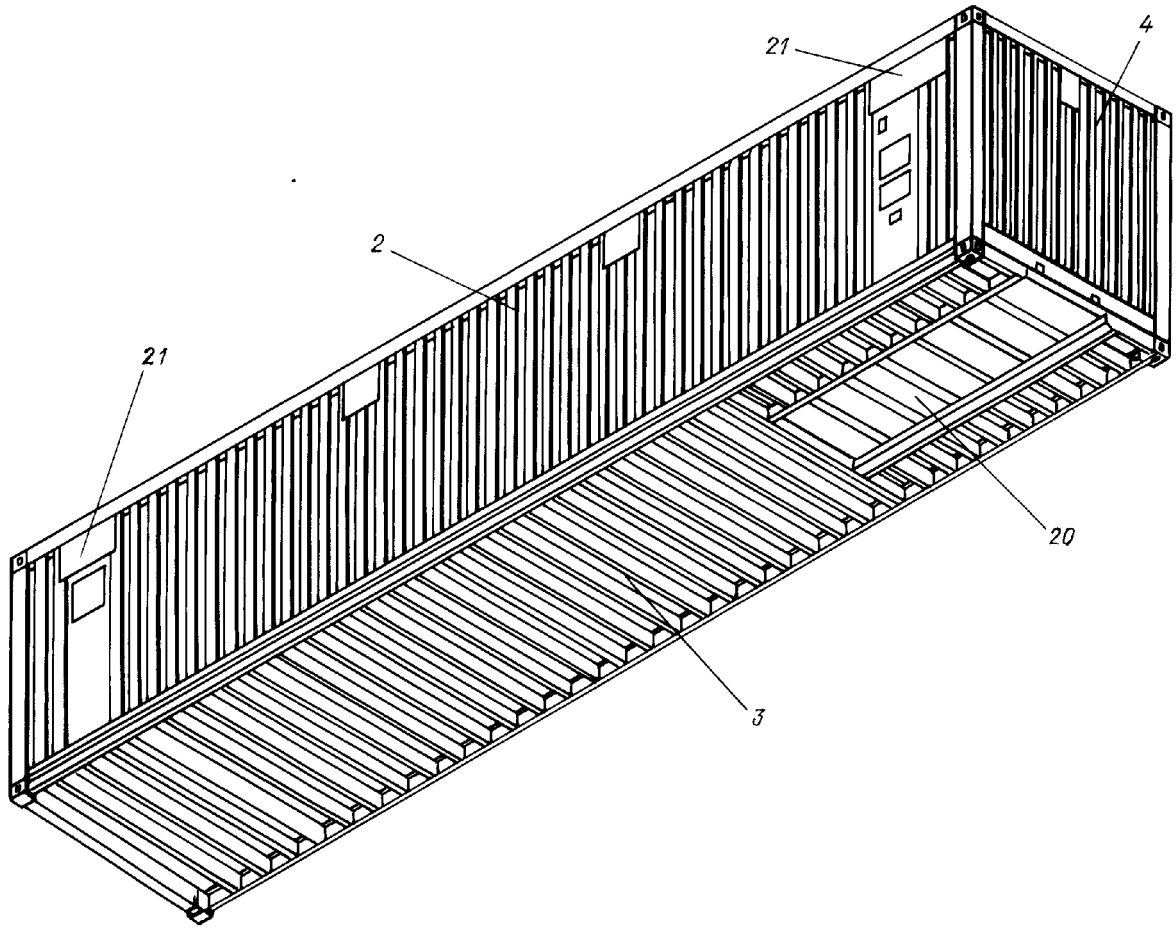


Fig.1.2.1-4 Structural elements of general cargo containers:
2,3,4 — see Fig.1.2.1-1; *20* — gooseneck tunnel; *21* — ventilation unit

1.3 SCOPE OF SUPERVISION

1.3.1 Technical supervision of the Register shall cover:

framework (bearing structure);
walls, floor and roof;
corner fittings;
doors and their locking devices;
covers for open top containers.

1.4 TECHNICAL DOCUMENTATION

1.4.1 For general cargo containers, the technical documentation stated in 1.3.3, Part I "Basic Requirements", shall comprise:

1.4.1.1 specification of the container;

1.4.1.2 test program and test procedure for the container;

1.4.1.3 the State Health Authorities approval of the floor material and its antiseptic impregnation, coverings and sealants;

1.4.1.4 drawings of the following parts, assemblies and general views, inclusive of all the specified dimensions:

.1 corner fittings;
.2 door locks;
.3 ventilation arrangements;
.4 corner posts;
.5 top and bottom end rails;
.6 top and bottom side rails;
.7 roof;
.8 base with bottom corner fittings and gooseneck tunnel;
.9 floor (fastening, caulking, size of panels and boards, construction of planking);

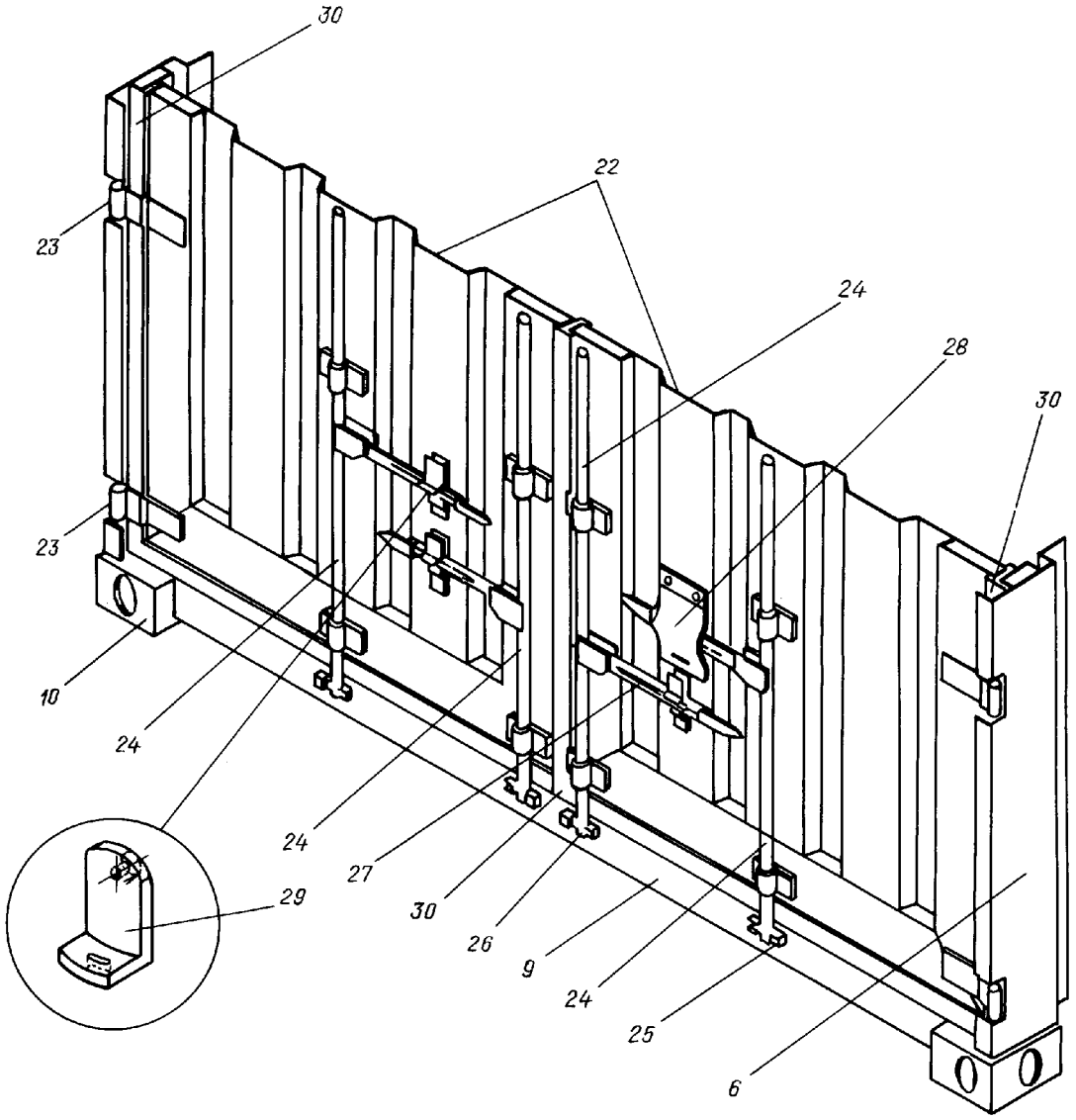


Fig.1.2.1-5 Structural elements of general cargo containers (door):
6,9 — see Fig.1.2.1-1; *10* — see Fig.1.2.1-2; *22* — door panel; *23* — hinge; *24* — door locking bar;
25 — cam retainer; *26* — cam; *27* — door locking handle; *28* — Customs seal protection cover (allowed not to be fitted);
29 — device for affixing the Customs seal; *30* — door gasket

.10 doors assembled with gaskets and locks;

.11 details covered by requirements of the CCC Convention;

.12 the CSC Plate and Customs Approval Plate for Containers [1];

.13 general views and markings of the container;

.14 roof and detachable bows for affixing the container sheet;

.15 container sheet with views of seams and edges, wire rope with end-pieces for affixing of the Customs seal;

.16 locks of top rails (if removable);

.17 cargo securing arrangements of the container (if any).

Note. Requirements 1.4.1.3.14-1.4.1.3.16 are applicable only to general cargo containers with open top.

The extent of above documentation is the minimum required.

[1] Hereinafter called "the CCC Plate".

2 TECHNICAL REQUIREMENTS

2.1 INTERNAL DIMENSIONS

2.1.1 Closed containers are to have internal dimensions not less than given Table 2.1.1.

Table 2.1.1

Minimum internal dimensions of containers, in mm

Designation of container	Height	Width	Length
1AAA	2566	2330	11998
1AA	2350	2330	11998
1A	2197	2330	11998
1AX	< 2197	2330	11998
1BBB	2566	2330	8931
1BB	2350	2330	8931
1B	2197	2330	8931
1BX	< 2197	2330	8931
1CC	2350	2330	5867
1C	2197	2330	5867
1CX	< 2197	2330	5867
1D	2197	2330	2802
1DX	< 2197	2330	2802

Note. The part of top corner fitting protruding into the inner space of the container shall not be regarded as a ground for reducing the required internal dimensions of the container.

2.2 DOOR OPENING

2.2.1 Containers shall be provided with a door opening at least at one end.

2.2.2 Closed 1A, 1B, 1C and 1D containers shall have a door opening preferably having dimensions equal to those of the internal cross-section of the container and in any case not less than 2134 mm high and 2286 mm wide; while for 1AA, 1BB and 1CC containers the door opening shall be not less than 2261 mm high and 2286 mm wide and for 1AAA, 1BBB containers — not less than 2566 mm high and 2286 mm wide.

2.3 DOORS

2.3.1 All doors shall open and close freely, the closing shall provide tightness. The angle of opening of each end door shall be 270°, and that of a side door, 180°.

Suitable stop devices shall be provided for keeping the doors open.

3 TESTING

3.1 GENERAL

3.1.1 Irrespective of the design, designation and material used for the construction, the general cargo containers shall be subjected to test loadings and testing procedures set forth in 3.2-3.16, while the specified dimensions and tare mass shall be determined in accordance with the requirements of 3.17. Application of loads different from those given in 3.7, 3.10, 3.13 and 3.14 shall be subject to special consideration of the Register.

3.1.2 The test devices for creating the required test loadings shall not interfere with free deflection of container sections under test.

3.1.3 Upon completion of each test the container shall show neither permanent deformations nor abnormalities which could render it incapable of being used for its designed purpose.

3.1.4 The order of tests is not mandatory, except that the test under 3.15 shall be made last and be applied to each container.

3.2 LIFTING BY TOP CORNER FITTINGS

3.2.1 The container having the prescribed internal loading shall be carefully lifted in such a way that no significant acceleration forces are applied.

After lifting, the container shall be suspended for 5 min and then carefully lowered to the ground.

3.2.2 The container shall have a uniformly distributed loading such that the combined mass of the container and test load is equal to $2R$.

3.2.3 The external forces applied to the container shall be such as to permit lifting a combined mass of $2R$, by the following methods:

for 1AAA, 1AA, 1A, 1AX, 1BBB, 1BB, 1B, 1BX, 1CC, 1C and 1CX containers, vertically at all four fittings (Fig. 3.2.3, a);

for 1D and 1DX containers, at all four corner fittings, so that the angle between each lifting device and the vertical is 30° (Fig.3.2.3, b).

3.2.4 When lifting by the top corner fittings the measurements shall be taken to determine:

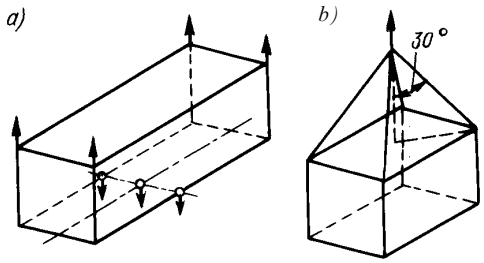


Fig. 3.2.3 Lifting by top corner fittings

.1 deflection at the lowest points of side rails and at longitudinal centre line of the base, while the container is loaded and supported by bottom corner fittings;

.2 maximum elastic deformations during lifting;

.3 permanent set remaining on removal of the load.

3.3 LIFTING BY BOTTOM CORNER FITTINGS

3.3.1 The container having the prescribed loading shall be carefully lifted in such a way that no significant acceleration forces are applied.

After lifting, the container shall be suspended for 5 min.

3.3.2 The container shall have a uniformly distributed loading such that the combined mass of the container and test load is equal to $2R$.

3.3.3 The external forces applied to the container shall be such as to permit lifting a combined mass of $2R$, by the following method:

the lifting devices shall be secured through the side apertures of the bottom corner fittings so that the lines of action of the lifting forces and the outer faces of corner fittings shall be no farther apart than 38 mm, with the lifting forces applied at an angle to the horizontal (Fig. 3.3.3) of:

30°, for 1AAA, 1AA, 1A, 1AX containers;

37°, for 1BBB, 1BB, 1B, 1BX containers;

45°, for 1CC, 1C, 1CX containers;

60°, for 1D and 1DX containers.

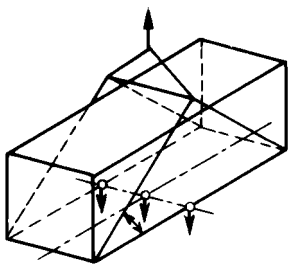


Fig.3.3.3 Lifting by the bottom corner fittings

3.3.4 When lifting by the bottom corner fittings the measurements shall be taken to determine the maximum elastic deformations during lifting and the permanent set of the container base.

3.4 LIFTING BY FORK LIFT POCKETS

3.4.1 Tests are carried out for 1CC, 1C, 1CX, 1D and 1DX containers having fork lift pockets.

The container having the prescribed loading shall be carefully lifted in such a way that no significant acceleration forces are applied.

After lifting, the container shall be suspended for 5 min.

3.4.2 The container shall have a uniformly distributed internal loading such that the combined mass of the container and test load is equal to $1{,}6R$.

3.4.3 The external forces applied to the container shall be such as to permit lifting of a combined mass of $1{,}6R$, in which case the container shall be placed on two bars which are in the same horizontal plane, one bar being centered within each fork lift pocket. The bars shall be of the same width as the forks intended to be used for handling the container, but not less than 200 mm, and shall project into the fork pocket for a distance of 1828 ± 3 mm, measured from the outer face of the container side.

3.4.4 In case of containers having four fork lift pockets on each side, tests under 3.4.3 shall be carried out for the most widely spaced pockets (outer), which are used for lifting a loaded container.

For pockets (inner) spaced at the least intervals which are used for lifting an empty container, the test procedure is similar to that outlined in 3.4.3, except that the external force applied shall be equal to $0{,}625R$.

When lifting by fork lift pockets the measurements shall be taken to determine the maximum elastic deformations during lifting and permanent set of the container base.

3.5 LIFTING WITH THE USE OF GRAPPLER ARMS

3.5.1 Tests are carried out for containers provided with grappler arm lifting areas.

The container having the prescribed internal loading shall be carefully lifted in such a way that no significant acceleration forces are applied. After lifting, the container shall be suspended for 5 min and then carefully lowered.

3.5.2 The container shall have a uniformly distributed internal loading such that the combined mass of the container and test load is equal to $1{,}25R$.

3.5.3 Where areas are provided for lifting by grappler arms, the container shall be placed on four pads in the same horizontal plane, one under each grappler arm area. These pads shall be of the same dimensions as the lifting area of the grappler arms

intended to be used for handling the container, but not less than 32×254 mm.

3.5.4 When lifting with the use of grappler arms the measurements shall be taken to determine the maximum elastic deformations during lifting and permanent set remaining on removal of the internal load.

3.6 OTHER LIFTING METHODS

3.6.1 Where containers are designed to be lifted in the loaded condition by any method not covered by 3.2, 3.3 and 3.5, they shall also be tested with internal loading and externally applied forces representative of the acceleration conditions appropriate to the method.

3.6.2 When carrying out the tests the measurements shall be taken to determine the maximum elastic deformations during lifting and permanent set remaining on removal of the load.

3.7 STACKING

3.7.1 The test shall be carried out to prove the ability of the loaded container to support the mass of stacked containers of the same length and loaded to the gross mass R, each under acceleration conditions taking into account the possible relative eccentricities between containers (Fig. 3.7.1).

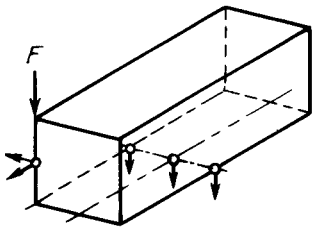


Fig. 3.7.1 Stacking test

3.7.2 A container having a uniformly distributed internal loading such that the combined mass of the container and test load is equal to $1{,}8R$, shall be placed on four level pads which in twin rest on a rigid horizontal surface. The pads shall be centralized under each corner fitting and be of approximately the same plan dimensions as the fittings.

3.7.3 The externally applied forces shall be simultaneously applied to each of the four top corner fittings through corresponding test corner fittings or through pads of the same dimensions as the corner fittings. The test corner fittings or pads shall be placed with respect to the top corner fittings in such a manner as to cover all positions of offset by 25 mm laterally and 38 mm longitudinally. The container shall be exposed to the externally applied forces during 5 min.

3.7.4 The external forces applied to each of the four top corner fitting shall be equal to:

848 kN — for 1AAA, 1AA, 1A, 1AX, 1BBB, 1BB, 1B, 1BX, 1CC, 1C and 1CX containers. These values are calculated on the assumption that the containers are stacked in nine tiers, mass $R = 24000$ kg and acceleration = 1,8 g;

224 kN — for 1D and 1DX containers. These values are calculated on the assumption that the containers are stacked in six tiers, mass $R = 10160$ kg and acceleration = 1,8 g.

In case when the external forces are applied to each pair of the top corner fittings the above values will be doubled.

3.7.5 For conditions of transport where the maximum vertical acceleration forces vary significantly from 1,8 g, and when the container may be effectively used only in such conditions of transport, the stacking load may be varied by the appropriate ratio of acceleration forces.

3.7.6 In the course of testing measurements shall be taken to determine:

.1 deflections at the lowest points of side rails and at the longitudinal centre line of the base;

.2 deflections both longitudinally and laterally at mid-height of corner posts or at nay point of maximum deflection of the corner posts;

.3 permanent set remaining on removal of the load.

3.8 ROOF STRENGTH

3.8.1 No internal loading is provided. The externally applied force which is a load of 3 kN uniformly distributed over an area of 600×300 mm, shall be applied vertically downwards to the outer surface at the weakest point of the roof (Fig. 3.8.1).

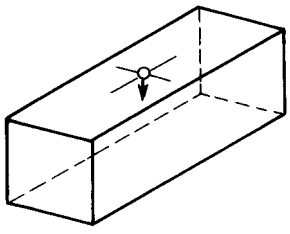


Fig. 3.8.1 Roof strength test

3.8.2 In the course of testing the measurements shall be taken to determine the maximum deflection of the roof section under test and permanent set.

3.9 FLOOR STRENGTH

3.9.1 The container shall be placed on four level supports under its four bottom corners in such a way that the base structure of the container is free to deflect (Fig.3.9.1).

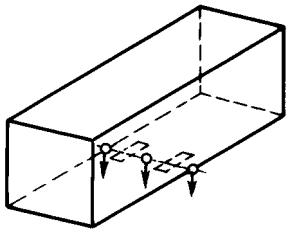


Fig. 3.9.1 Floor strength test

3.9.2 A truck loaded to an axle weight of 54,6 kN that is 27,3 kN on each of two wheels, is used as internal concentrated load applied to the floor. The contract area of the wheels when loaded shall be 284 cm^2, that is 142 cm^2 on each wheel, the wheel width being 180 mm and the distance between centres of the wheels 760 mm; all contact points are to be within a rectangle of 185 mm (parallel to the wheel axle) and 100 mm in size. The truck shall be manoeuvred over the entire floor area of the container. No external forces are applied to the container.

3.9.3 In the course of testing the measurements shall be taken to determine deflection of the base at three locations of the truck and permanent set.

3.10 TRANSVERSE RACKING

3.10.1 The 1AAA, 1AA, 1A, 1AX, 1BBB, 1BB, 1B, 1BX, 1CC, 1C and 1CX containers shall be capable of withstanding the transverse racking forces.

3.10.2 A container with no internal loading shall be placed on four level supports, one under each of the four bottom corner fittings (Fig.3.10.2). The container shall be restrained against vertical movement by means of the anchor device acting through the bottom apertures of bottom corner fittings. Lateral restraint is provided by means of anchor device acting alternately through the side apertures of bottom corner fittings diagonally opposite to those at which the forces are applied.

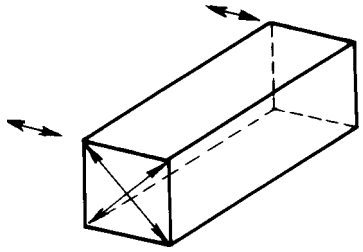


Fig. 3.10.2 Transverse racking test

External forces equal to 150 kN shall be applied either separately or simultaneously to each of the top corner fittings on one side of the container in lines parallel both to the base and to the planes of the end walls. The forces are applied first towards and then away from the top corner fittings.

If the end walls of the container are symmetrical about their own vertical centre lines, one side only need be tested. With asymmetric ends, the forces shall be applied to both sides.

The changes in lengths of the diagonals D_5 and D_6 (Fig. 2.2.1-3, Part I "Basic Requirements") shall be measured in the course of testing. The sum of these changes shall not exceed 60 mm.

3.11 LONGITUDINAL RACKING

3.11.1 The 1AAA, 1AA, 1A, 1AX, 1BBB, 1BB, 1BX, 1CC, 1C and 1CX containers shall be capable of withstanding the longitudinal racking forces.

3.11.2 A container with no internal loading shall be placed on four level supports, one under each of the four bottom corner fittings (Fig.3.11.2). The container shall be restrained against vertical movement by means of an anchor device acting through the bottom apertures of bottom corner fittings. Longitudinal restraint is provided by means of the anchor device acting alternately through the end apertures of bottom corner fittings diagonally opposite to those at which the forces are applied.

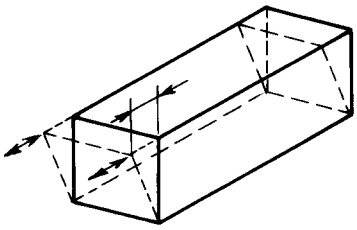


Fig. 3.11.2 Longitudinal racking test

External forces equal to 75 kN shall be applied separately or simultaneously to each of the top corner fittings on one end of the container in lines parallel both to the base and the planes of the sides. The forces are applied first towards and then away from the top corner fittings.

If the sides of the container are symmetrical about their own vertical centre lines and are also of similar construction, one end only need to be tested. Where the sides are asymmetrical and of a differing

construction as many tests shall be carried out as are necessary to cover all possible modifications.

Longitudinal displacement of top side rails shall be measured during the test. The value of displacement shall not exceed 25 mm.

3.12 LONGITUDINAL RESTRAINT (STATIC TEST)

3.12.1 A container having a uniformly distributed internal loading such that the combined mass of the container and test load is equal to *R*, shall be restrained longitudinally by securing the bottom corner fittings (through the bottom apertures) at one end of the container to suitable anchor points (Fig.3.12.1). Two external forces, each equal to *Rg*, shall be applied horizontally to both unsecured bottom corner fittings, first towards and then away from the anchor points so that the base of the container is subjected to the action of a combined force of 2*Rg*.

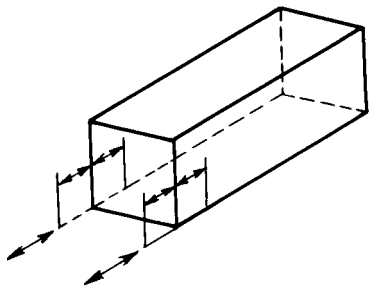


Fig.3.12.1 Longitudinal restraint

In the course of testing the change in length of each bottom side rail shall be measured in both directions.

3.13 STRENGTH OF END WALLS

3.13.1 The end wall shall be capable of withstanding an internal loading equal to 0,4*Pg*. The container may, however, be tested by a loading lesser or greater than 0,4*Pg* (or any other loading to which the wall is designed) uniformly distributed over the whole surface in such a way as to allow free deflection of the wall (Fig.3.13.1).

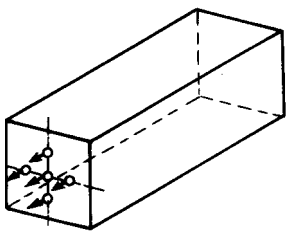


Fig. 3.13.1 End wall strength test

No external forces are applied.

Both end walls shall be tested. However only one wall need be tested when both are similar in construction.

In the course of testing the measurements shall be taken to determine the deflection at the centre and at least two other points of the wall, and permanent set at the same locations.

3.14 STRENGTH OF SIDE WALLS

3.14.1 The side walls shall be capable of withstanding an internal loading of 0,6*Pg*. The container may, however, be tested by a loading lesser or greater than 0,6*Pg*, if the side walls have been designed to withstand such loading.

The inner surface of the side wall shall be subjected to a loading of 0,6*Pg* (or any other loading to which the wall is designed) uniformly distributed over the whole surface in such a way as to allow the side wall and its top and bottom side rails to deflect freely. The loading shall be applied separately to each side wall (Fig. 3.14.1). No external forces are applied.

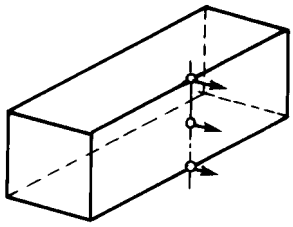


Fig. 3.14.1 Side wall strength test

Both side walls shall be tested. However, only one wall need be tested when both are similar in construction.

In the course of testing the measurements shall be taken to determine deflection at the centre of the wall and at mid-length of the top and bottom side rails, as well as permanent set at the same locations.

3.15 WEATHERTIGHTNESS

3.15.1 All outer surfaces, connections and seams of the container shall be subjected to a stream of water, providing that:

.1 nozzle diameter — 12,5 mm;

.2 water pressure measured at the nozzle outlet — 0,1 MPa;

.3 distance from the nozzle to the surface under test — 1,5 m;

.4 nozzle directed to the surface at an angle of 90°;

.5 speed of stream — 100 mm/s.

Several nozzles may be used for testing provided the above requirements are fulfilled as for a single nozzle.

Upon completion of the test the inner surfaces of the container must be dry.

The weathertightness test may be performed by any other method approved by the Register.

3.16 STRENGTH OF CARGO SECURING DEVICES

3.16.1 The test shall be carried out for containers fitted with cargo securing devices.

3.16.2 The cargo securing devices shall be capable of withstanding a loading which is 1,5 times higher than the design loading. The lines of action of the forces applied are directed:

for arrangements fitted on the base structure, at right angles to the centre line of the structural elements and at an angle of 45° to the horizontal plane;

for arrangements fitted above the base structure, at an angle of 45° upwards and downwards in respect to the horizontal plane;

3.16.3 The minimum design loading for the arrangements fitted on the floor is equal to 1000 kg, for other arrangements — 500 kg. The arrangements shall be subjected to the loading for at least 5 min.

In the course of testing the measurements shall be taken to determine permanent set of devices and structural elements of the containers at the points where they are fastened.

3.17 INSPECTIONS

3.17.1 Inspections comprise visual inspection, verification of specified dimensions and weighing of the container.

Visual inspection shall be conducted during the manufacture of the container and/or upon completion of works, to ascertain that the container design, materials and workmanship comply with the requirements of the present Rules. Visual inspection shall include checking of the opening and closing of the doors.

The specified dimensions shall be verified before commencement, as well as on completion, of the tests.

The container shall be weighed upon completion of all works including painting.

PART III. THERMAL CONTAINERS

1. GENERAL

1.1 APPLICATION

1.1.1 The provisions of the present Part of the Rules apply to thermal containers.

1.1.2 Thermal containers shall comply with requirements of Part I "Basic Requirements", and with requirements of the present Part of the Rules.

1.1.3 Thermal containers differing in design and dimensions from those defined in this Part, including thermal swap bodies and offshore thermal containers, are subject to special consideration by the Register in each particular case.

1.2 DEFINITIONS AND EXPLANATIONS

For definitions and explanations referring to general terms of the Rules, see Part I "Basic Requirements". For the purpose of this Part of the Rules the following definitions apply:

Thermal container is a container the walls, doors, floor and roof of which are insulated to limit heat exchange between the inside and outside of the container.

The thermal containers include the following container types:

insulated container is a thermal container without the use of permanently attached devices for cooling and/or heating;

refrigerated container with expendable refrigerant is a thermal container using a source of cold such as ice, dry ice with or without sublimation control, liquified gases with or without evaporation control, and requiring no external power supply;

mechanically refrigerated container is a thermal container served by a refrigerating unit (of compression or absorption type);

heated container is a thermal container served by a heat producing appliance;

refrigerated and heated container is a thermal container served by a refrigerating unit or using an expandable refrigerant and heat producing appliance.

Refrigerating unit is the equipment comprizing one or several mechanical refrigeration units, pipelines, control and monitoring devices, and designed to create and maintain the prescribed temperature inside the container.

Refrigerating machine is a machine consisting of a prime mover, one or several compressors, one condenser and evaporator as well as necessary fittings, control devices to ensure independent operation of the machine.

Refrigerating machinery space is a space or enclosure containing compressors and other elements of the refrigerating machinery.

Internal volume is a volume confined within the inner surfaces of a thermal container. Battens and equipment, located inside the container, are not included into the internal volume.

Batten is a structural element of the container protruding from the inside walls and/or roof, built integral with, or fastened to the walls or roof, or installed during cargo loading to create a clearance between cargo and wall and/or roof for air circulation.

Drainage is a system intended to drain liquid from defrosting internal surfaces of the container and to relieve internal pressure, and which comprises trays, pipes, drain openings and appropriate closures.

Ceiling duct is a passage or passages located in proximity to the ceiling to direct air flow.

Floor air duct is a passage or passages located beneath the freight support surface for air circulation.

Removable equipment means the refrigerating and/or heating unit so designed and constructed that it may be attached to, or detached from, the container when transferring between different modes of transport.

1.3 SCOPE OF SUPERVISION

1.3.1 Technical supervision of the Register shall cover:

.1 framework (bearing structure including the walls, insulation, floor and roof);

.2 corner fittings;

.3 doors and door locks;

.4 stationary refrigerating and/or heating units of the container;

.5 electrical equipment;

.6 electric power source with prime mover.

1.3.2 In the course of manufacture components, assemblies, units and equipment, specified in 1.3.1 shall comply with the requirements of the present Rules and are subject to control over fulfilment of the

requirements of Part IX "Machinery", Part X "Boilers, Heat Exchangers and Pressure Vessels", Part XI "Electrical Equipment", Part XII "Refrigerating Plants" and Part XV "Automation" of the Rules for the Classification and Construction of Sea-Going Ships, as applied to the thermal containers.

1.4 TECHNICAL DOCUMENTATION

1.4.1 For approval by the Register of a thermal container by design type or individually the following technical documentation in triplicate shall accompany the application for approval, in addition to the technical documentation specified in 1.3.3, Part I "Basic Requirements":

.1 specification, diagrams and drawings of refrigerating and/or heating units with thermal, mechanical and other characteristics;

.2 specification of electrical equipment with parameters of circuit breakers, control and indication facilities, drawings of plug and socket connections, operating diagrams;

.3 specification, diagrams and drawings of electrical power source with its prime mover;

.4 specification of thermal insulation;

.5 thermal calculations;

.6 program and procedure of thermal tests with indication of values which shall be attained;

.7 program of prototype testing and type-series production of refrigerating and/or heating units.

2 TECHNICAL REQUIREMENTS

In addition to the requirements contained in this Section, the thermal containers shall meet the requirements of Section 2, Part I "Basic Requirements".

2.1 INTERNAL DIMENSIONS

The minimum internal dimensions of the thermal containers are given in Table 2.1.

2.2 EQUIPMENT FOR HANGING CARGO

The structure of equipment designed for the carriage of hanging cargo shall withstand the loads indicated in 3.2.2.

2.3 DOOR OPENING

Each container shall be provided with a door opening at least at one end.

The door opening shall preferably have dimensions equal to those of the internal cross-section of the container but the width of such door opening shall not be less than that given in Table 2.1.

2.4 DOORS

Requirements for the doors are outlined in 2.2 of Part II "General Cargo Containers".

Table 2.1

Container code	Minimum length[1] = nominal external containers length minus, mm	Minimum width = nominal external container width minus, mm	Minimum height[1] (without gooseneck tunnel) = nominal external container height minus, mm	Minimum height[1] (with gooseneck tunnel) = nominal external container height minus, mm
30, 31, 32, 33	690	220	345	385
36, 37, 38, 41	990			
40	440			
42	390	180	310	350
45	340	220	285	340
46	290	180	250	290

[1]A part of the container length and height shall be used for air circulation.

2.5 THERMAL CHARACTERISTICS

2.5.1 Thermal containers shall be so designed as to provide thermal characteristics indicated in Table 2.5.1.

2.6 TEMPERATURE MEASURING DEVICES

2.6.1 Thermal containers, except for insulated and refrigerated containers with expendable refrigerant, shall be fitted with temperature measuring devices to permit indication of temperature outside the container.

2.6.2 In thermal containers other than insulated and refrigerated ones with expendable refrigerant, there shall be fitted a temperature recorder to record the temperature inside the container.

Table 2.5.1

Container code	Container type	Maximum heat transfer U_{max}, W/°C, for container designations						Temperature, °C	
		1D	1C, 1CC	1B, 1BB	1BBB	1A, 1AA	1AAA	inside	outside
30	Refrigerated container with expendable refrigerant	15	26	37	40	48	51	−18	+38
31	Mechanically refrigerated container	15	26	37	40	48	51	−18	+38
32	Refrigerated and heated container	15	26	37	40	48	51	+16/−18	−20/+38
33	Heated container	15	26	37	40	48	51	+16	−20
36	Mechanically refrigerated container with its own power source	15	26	37	40	48	51	−18	+38
37	Refrigerated and heated container with its own power source	15	26	37	40	48	51	+16/-18	−20/+38
38	Heated container with its own power source	15	26	37	40	48	51	+16	−20
40	Mechanically refrigerated and/or heated refrigerated container with expendable refrigerant and/or heated container with removable equipment fitted outside the container	15	26	37	40	48	51	—	—
41	Mechanically refrigerated and/or heated/refrigerated container with expendable refrigerant and/or heated container with removable equipment fitted inside the container	15	26	37	40	48	51	—	—
42	Mechanically refrigerated and/or heated/refrigerated container with expendable refrigerant and/or heated container with removable equipment fitted outside the container	26	46	66	71	86	92	—	—
45	Insulated container	15	26	37	40	48	51	—	—
46	Insulated container	26	46	66	71	86	92	—	—

Notes.

1. The heat transfer value for a container with enhanced insulation (codes 30, 31, 32, 33, 36, 37, 40, 41 and 45) corresponds to thermal conductivity $K \leqslant 0{,}4$ W/m^2°C.
2. The heat transfer value for a container with normal insulation (codes 42 and 46) corresponds to thermal conductivity $K \leqslant 0{,}7$ W/m^2°C.
3. No temperature limits are determined for containers with codes 40, 41 and 42. Such limits depend on capacity of the removable refrigerating or heating unit used on various vehicles.

2.7 VENTILATION

2.7.1 Air opertures for the ventilation of the internal volume of a container shall have closures readily accessible from outside.

2.7.2 The air circulation openings of 1AA, 1CC and 1C containers, where removable equipment is used for refrigerating or heating of the container, shall comply with the following requirements (Fig. 2.7.2):

.1 the bosses for holes shall be minimum 457 mm in diameter or square for 1CC and 1C containers and minimum 550 mm for 1AA containers;

.2 the face of bosses shall be smooth with a tolerance of 0,25 mm on the parallel plane of the front faces of corner fittings;

.3 a clearance of 3 to 4,8 mm shall be provided between the plane of the front faces of corner fittings and the face of bosses;

.4 the bore of the hole shall be not less than 254 mm in diameter for 1CC and 1C containers and not less than 350 mm for 1AA containers;

.5 the opening shall have closures complying with the requirements of the Rules for the Approval of Containers for the Transport of Goods Under Customs Seal.

The size of openings and their location for containers of other designations shall be specially considered by the Register in each particular case.

2.8 DRAINAGE

2.8.1 The bottom portion of the container may be fitted with drainage complying with the following requirements:

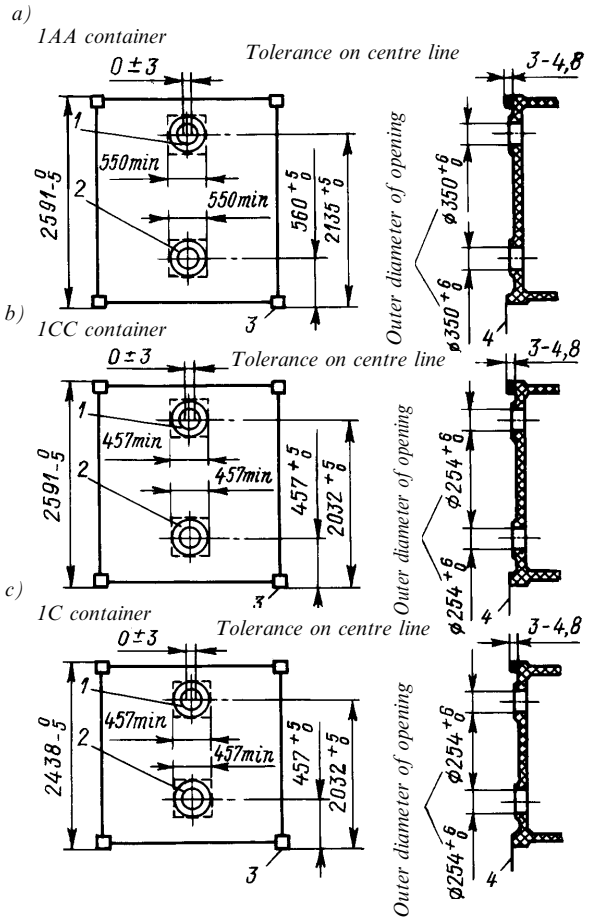


Fig. 2.7.2 Air apertures in end wall (front and lateral view) of 1AA, 1CC and 1C containers:
1 - air outlet hole; *2* - air inlet hole; *3* - bottom face of bottom corner fitting; *4* - front face of bottom corner fitting

.1 the drains, if required to operate when carrying cargo, shall have suitable fittings which open automatically above normal internal operating pressure;

.2 if required for cleaning of the interior of the container, the drain fittings shall be provided with manual closures;

.3 the design of the draining system shall comply with the requirements of the Rules for the Approval of Containers for the Transport of Goods Under Customs Seal.

2.9 ADDITIONAL SEATS FOR ATTACHING REMOVABLE EQUIPMENT

If the containers are suitable for attachment of removable equipment, additional seats shall be made and located according to Fig. 2.9.

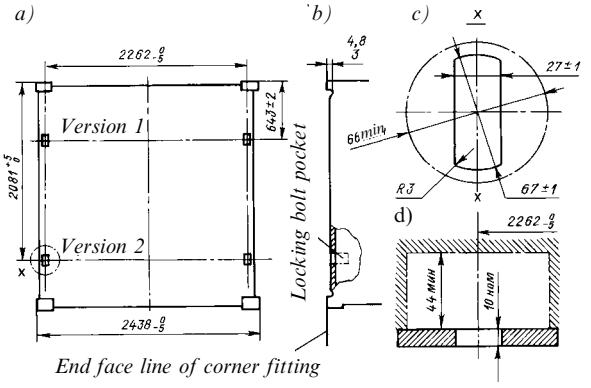


Fig. 2.9 Location of additional seats used for attaching removable equipment to the container:
a) front view of the container; *b)* lateral view of the container; *c)* seat section; *d)* seat profile

2.10 MATERIALS

2.10.1 Materials used for construction of a container, as well as its refrigerating and heating equipment shall not have an adverse effect on the cargo carried (especially, on the foodstuffs).

2.10.2 The inner surface of the thermal container shall meet the following requirements:

.1 the inner surfaces, as far as practicable, shall be plane and shall not permit moisture to accumulate;

.2 the inner surfaces shall be resistant to steam, detergents and disinfectants;

.3 the inner surfaces shall be provided with the pockets accessible to normal cleaning and disinfecting procedures.

2.10.3 Thermal containers shall have their outer and inner surfaces light-coloured (white, light-grey, silvery, etc.).

2.10.4 The insulating materials of a container shall ensure heat conductivity determined from Table 2.5.1, be non-hydroscopic, as far as practicable, and have physical and chemical resistance, remaining at the same time neutral to the materials with which they are in contact.

2.10.5 The insulation of a container shall be covered with a lining of adequate strength to protect the insulation during container handling operations.

2.11 REFRIGERATING AND HEATING UNITS

2.11.1 The requirements of this Chapter cover the refrigerating units employing R-134A or R-22 refrigeration compressors. The use of refrigerating units of other designs or compressors with refrigerants other than stated above, is subject to special consideration of the Register in each particular case.

Toxic, flammable and aggressive refrigerants shall not be used in refrigerating units of containers.

2.11.2 The refrigerating unit of a container:

.1 shall be fitted with a hermetic or semi-hermetic compressor;

.2 shall be air cooled;

.3 shall be designed for continuous running and have a capabity sufficient to maintain the minimum required temperature inside the container at maximum outside temperature, when running not more than 18 hours a day;

.4 shall have all the equipment fully automated, inclusive of defrosting devices;

.5 shall have reliable overpressure protection, with the pressure-relief devices, located outside the internal volume of the container;

.6 shall include precautions to prevent freezing of the elements of the automatic control devices;

.7 shall be fitted with hand controls operable from a readily accessible position;

.8 shall withstand vibration and impacts during conveyance by different modes of transport.

2.11.3 Provision shall be made in the container for fitting of at least one thermometer to control the operation of refrigerating unit and also for measurements to be taken by a test thermometer.

2.11.4 If the internal combustion engine is used as prime mover the following conditions shall be met:

.1 the engine shall run on fuel with flash point no less than 55°C;

.2 the fuel tank shall be provided with draining arrangements and a level gauge;

.3 the air pipe shall be fitted with a flameproof head;

.4 to prevent restarting the engine shall be shut down automatically when the fuel level in tank is minimum;

.5 the exhaust pipe of the engine shall be fitted with a spark arrester;

.6 the engine shall be started up freely at least at a temperature of —10°C.

2.11.5 A refrigerated container with expendable refrigerant shall be fitted with arrangements for draining the rest of refrigerant after consumption.

2.11.6 A heating unit shall meet the requirements applicable to refrigerating unit with respect to capacity, operation and safety.

2.12 ELECTRICAL EQUIPMENT

2.12.1 Electrically powered equipment.

2.12.1.1 It is permissible to use in containers such equipment which is operating from electrical power supplies with characteristics as follows:

3-phase current with voltage of 180 to 230 V at a frequency of 50 Hz, as well as voltage of 200 to 250 V at a frequency of 60 Hz (Type I Equipment);

3-phase current with voltage of 360 to 460 V at a frequency of 50 Hz, as well as voltage of 400 to 500 V at a frequency of 60 Hz (Type II Equipment);

3-phase current with voltages and frequencies of both Type I and Type II Equipment (Type III Equipment).

2.12.1.2 Where electrical equipment of the container is designed to operate on voltages other than indicated in 2.12.1.1, there shall be fitted a transformer supplied with voltages prescribed for Type I or Type II Equipment.

2.12.2 General requirements.

2.12.2.1 The type of protective enclosure used for the equipment shall be not less than 1P56.

2.12.2.2 The electrical equipment shall operate reliably at frequency variations from nominal values within $\pm 2{,}5\%$.

2.12.2.3 The total power of electrical equipment under rated operating conditions shall not exceed 15 kW (18,75 kVA).

2.12.2.4 Electrical equipment shall be earthed in such a way that when supplied from external source of power, the earthing is effected by means of a special core in the flexible power cable, and through a separate earthing conductor of at least 16 mm^2 cross-section, connected to the structure of container, when supplied from its own power source.

2.12.2.5 The insulation resistance of the electrical equipment shall be not less than 1 MOm.

2.12.2.6 The electrical apparatus of the container shall have a switch to permit disconnection from external power source. Such switch shall also effect transfer of all electric circuits to operation from the container's own supplies, with the driving machinery of refrigerating unit running in any of the prescribed operating ranges.

2.12.3 Cables.

2.12.3.1 A four-core flexible power cable shall be used to supply the equipment of the container from an external source of electric power. A core shall have a cross-section area sufficient for voltages to be supplied to all the consumers simultaneously according to 2.12.2.3. The length of the cable shall be equal to the length of the container plus 6 m, or 15 m, whichever is greater.

2.12.3.2 The flexible power cable shall be permanently attached to the terminals of electric apparatus of the container, while the free and shall have a 4-pin plug (3 poles and 1 earth).

2.12.3.3 Type III equipment shall be provided with two cables so that different voltage supplies are possible.

2.12.3.4 A flexible power cable shall be stored in a well ventilated space used solely for this purpose.

2.12.3.5 Electrical equipment of the container when supplied from an external source of power shall operate with clockwise phase rotation A(R), B(S), C(T), according to a scheme presented in Fig. 2.12.3.5.

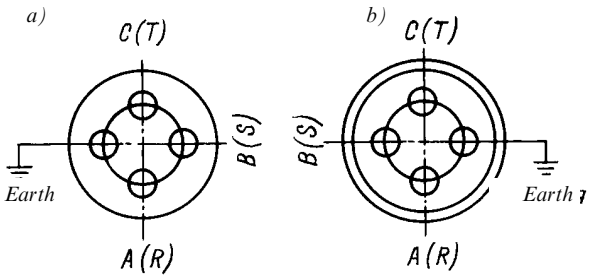


Fig.2.12.3.5 Phase connections to container plugs and sockets:
a) front view of plug;
b) front view of socket

2.12.4 Plug and socket connections.

2.12.4.1 The plugs of flexible power cables shall, depending on supply voltages, be designed for the following rated currents:

60A, for Type I Equipment;

32A, for Type II Equipment;

both 60 and 32A, for Type III Equipment.

2.12.4.2 The design and dimensions of plugs and sockets shall comply with accepted national and international standards.

2.12.5 Switch gear, control and protection devices.

2.12.5.1 The equipment controls shall be located in accessible positions, be easy for operation and be adequately protected against mechanical damage.

2.12.5.2 The electrical consumers of the container shall be supplied through a switch so arranged as to provide disconnection of power supply at all phases when in off-position. A visual signal shall be provided to indicate that the switch is in on-position.

2.12.5.3 With the switch in on-position the electrical equipment shall operate automatically under cooling or heating conditions.

2.12.5.4 The control devices and electric motors shall be so designed that the peak initial starting current is as low as possible. In no case shall the starting current exceed:

300 A for Type I Equipment;

150 A for Type II Equipment.

2.12.5.5 The increase in motor rotation speed when started shall be such that the starting currents, stated in 2.12.5.4, will delay to 1,25 times the rated current in not more than 1 s.

2.12.5.6 The switch gear shall be fitted with protective devices against overloads and short circuits.

2.12.5.7 The circuit breakers shall meet the following requirements:

.1 in case of Type I Equipment:

the circuit breaker shall trip at a continuous current up to 90 A;

it shall interrupt supply, once the current has reached:

200 A, with time delay minimum 3 s,

360 A, with time delay maximum 10 s,

over 600 A, within maximum 0,2 s;

.2 in case of Type II Equipment:

the circuit breaker shall trip at a continuous current up to 50 A;

it shall interrupt supply, once the current has reached:

100 A, with time delay minimum 3 s,

180 A, with time delay maximum 10 s,

over 300 A, within maximum 0,2 s.

3 TESTING

3.1 GENERAL

3.1.1 Irrespective of the design, designation and material chosen for construction of a thermal container, all types of thermal containers shall be subjected to test loads and testing procedures outlined in 3.1.5 and 3.2-3.7, with prescribed dimensions and tare mass to be determined according to 3.17, Part II "General Cargo Containers".

3.1.2 Refrigerated and/or heated containers shall be tested together with their cooling and/or heating units.

3.1.3 In testing refrigerated and/or heated containers with removable equipment, a mass or strength equivalent may be substituted for removable equipment.

3.1.4 On completion of each test, the container shall show neither permanent deformation nor abnormalities which may render it unsuitable for the designed purpose.

3.1.5 The test loads and testing procedures for lifting, stacking, floor strength, racking, longitudinal restraint (static test), strength of end and side walls are described in Section 3 of Part II "General Cargo Containers".

3.1.6 Gauges used in testing shall be certified by a competent authority and shall provide the following accuracy of measurements:

temperature gauges (protected from radiation heat): $\pm 0{,}5°C$;

electrical measuring instruments: $\pm 2\%$;

flowmeters: $\pm 3\%$;

pressure gauges: $\pm 5\%$.

3.2 STRENGTH OF THE ROOF AND FITTINGS FOR THE CARRIAGE OF HANGING CARGO

3.2.1 The roof testing procedure is outlined in 3.8 of Part II "General Cargo Containers".

3.2.2 Where fittings for the carriage of hanging cargo are used in a thermal container, they shall withstand an internal test loading of 30 kN per 1 m of the internal useful length of the container, or a double operating load per 1 m of the internal useful length, whichever is the greater.

On completion of testing, the fittings for the carriage of hanging cargo shall have no damages and deformations, affecting their safe use.

3.3 WEATHERTIGHTNESS

The container subjected to testing shall be fitted with full number of equipment prescribed in specifications. The testing procedure and characteristics of the water stream are set out in 3.15 of Part II "General Cargo Containers". The test shall be carried out on door gaskets, external flanged connections, opening fitted with closing devices, as well as refrigerating units and their attachments to container. Upon completion of the test the inner surfaces of the container must be dry.

3.4 AIRTIGHTNESS

3.4.1 The airtightness test shall be carried out after completion of the tests stated in 3.1.5, 3.2 and 3.3, and prior to thermal test.

3.4.2 The test shall be performed at the temperatures outside and inside the container within the range of $+15$ to $+25°C$ under the standard atmospheric conditions.

3.4.3 During testing the outside and inside temperatures shall be stabilized within $3°C$ of one another.

3.4.4 The container shall be fitted with full number of equipment prescribed in specifications. Doorways, ventilation, drain and other openings shall be closed in normal manner.

3.4.5 The air duct to the container shall be fitted with a calibrated metering device to control the air supply, a pressure gauge and a flowmeter. The pressure gauge shall be connected to the container itself, outside the air supply system.

3.4.6 An excessive internal pressure equal to 250 ± 10 Pa (25 ± 1 mm W.G.) shall be produced in the container.

After the pressure in the container reaches a steady-state value, air flow required to maintain this pressure shall be recorded.

Measurement of air flow shall be taken during 30 min.

3.4.7 For all the thermal containers, with the exception of containers provided with additional door openings, determined for the standard atmospheric conditions, the air leakage shall not exceed $10 m^3/h$. For each additional door opening (e.g. for side doors), provision shall be made for an additional air leakage equal to $5\ m^3/h$.

3.5 THERMAL TEST

3.5.1 The thermal test shall be carried out subject to the condition that the container complies with the requirements of 3.4.4 and is prepared, with respect to its technical state, to operation under prescribed conditions. The removable refrigerating and/or heating equipment shall not be fitted to the container and the openings in end wall shall be closed.

3.5.2 The heat transfer required to make up heat balance, shall be determined only by internal heating method.

3.5.3 The heat transfer shall be determined as a total heat transfer to be derived from the formula

$$U_t = \frac{Q}{t_{outs.} - t_{ins.}} \qquad (3.5.3)$$

where U_t = total heat transfer;
t = mean average wall temperature, °C;
$t = \frac{t_{ins.} + t_{outs.}}{2}$
Q = power dissipated by the operation of internal heaters and fans, W;
$t_{ins.}$ = average temperature calculated as the arithmetic mean of the temperatures measured at least at 12 points inside the container at the end of each test period, °C (Fig.3.5.3-1);
$t_{outs.}$ = average temperature calculated as the arithmetic mean of the temperatures measured at least at 12 points outside the container at the end of each test period, °C (Fig.3.5.3-2).

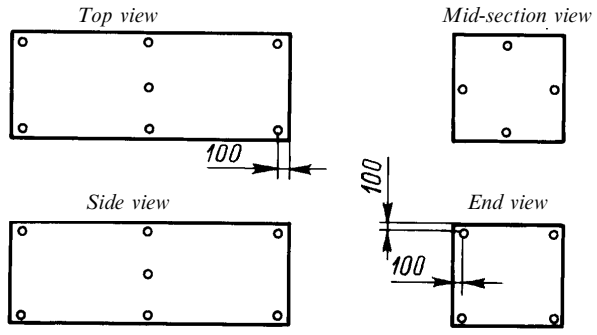


Fig. 3.5.3-1 Inside air temperature measurement points:
o — measurement point

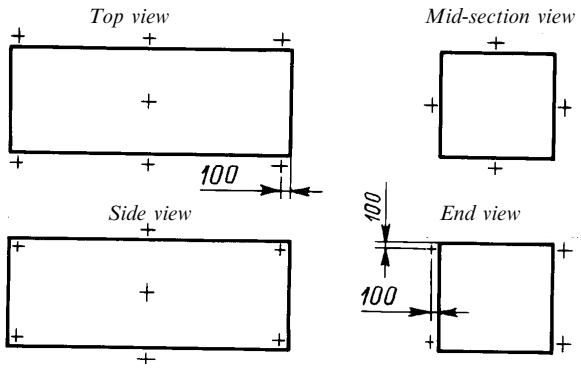


Fig. 3.5.3-2 Outside air temperature measurement points:
+ — measurement point

3.5.4 Measurements to determine the heat transfer of a container shall be taken uninterruptedly during 8 h and the following conditions shall be met:

.1 mean wall temperature shall be within a range of 20-32°C and the difference between the inside and outside air temperatures ($t_{ins.} - t_{outs.}$) shall be not less than 20°C;

.2 the maximum difference between the highest and the lowest temperatures at any one time shall not exceed 3°C both for the outside and inside temperatures;

.3 the maximum difference between any two mean air temperatures inside and outside the container shall not exceed 1,5°C;

.4 the maximum difference, expressed as a percentage, between the lowest and highest values of the dissipated power shall not exceed 3% of the lowest value.

3.5.5 All the gauges and devices shall provide accuracy of measurements indicated in 3.1.6 and the measurements shall be taken at not more than 30 min intervals.

3.5.6 Air current shall flow over the container surface with a speed of not more than 2 m/s measured at points located approximately 100 mm away from the middle of container side walls and roof.

3.5.7 All temperature gauges fitted inside and outside the container shall be protected from radiation heat.

3.5.8 The heat transfer U, W/°C shall be calculated as the arithmetic mean of the heat transfer values, measured within at least 8 h under thermal equilibrium conditions, by the formula

$$U = \frac{1}{n} \sum_{1}^{n} U_t \qquad (3.5.8)$$

where n = number of measurement points; $n \geqslant 17$.

The heat transfer value shall be recorded simultaneously with the mean wall temperature values obtained in the course of testing. The heat transfer value corrected for the standard mean wall temperature of 20°C shall also be recorded. The correction shall be made using a curve relating heat transfer to mean wall temperature relation. The heat transfer shall not exceed values given in Table 2.5.1.

3.5.9 Thermal conductivity, $W/m^2 \cdot °C$ shall be calculated using the following formula:

$$k = U/S$$

where $S = \sqrt{S_{in} Sout}$ is the geometric mean of the container surface area, m^2;
S_{in} is the inner surface area without corrugations, m^2;
S_{out} is the outer surface area without corrugations, m^2.

3.6 PERFORMANCE TEST OF REFRIGERATING UNIT

3.6.1 Where the thermal test shows positive results the container provided with permanent or

removable refrigerating machinery shall be placed in a room with air temperature consistent with this type of container (see Table 2.5.1).

3.6.2 After starting the refrigerating unit shall reduce the temperature inside the container to the temperature specified for that type of container (at outside temperature given in Table 2.5.1) and then maintain this temperature within 8 h, provided that the heat load passes through the container walls and roof.

3.6.3 With the thermal stabilization period completed according to 3.2.6, the container heater (heaters) and fan (fans) fitted inside the container shall be turned on to produce additional heat load, W, equal to:

$$Q = 0{,}25U_t(t_{outs.} - t_{ins.}). \quad (3.6.3)$$

For notations, see 3.5.3.

3.6.4 With the heating unit in operation, the refrigeration equipment shall be capable, after re-stabilization of the operating conditions, of maintaining the inside temperature prescribed in 3.6.2 for a period of not less than 4 h.

3.6.5 During testing, the container shall be fitted with gauges to measure:

.1 air temperature at 12 points outside and inside the container (see Fig. 3.5.3-1 and 3.5.3-2);

.2 air inlet and outlet temperatures (dry bulb temperature sensor) inside the container (at least two sensors on each side);

.3 refrigerant temperature at the inlet of the outside air cooled condenser;

.4 power consumed by the heater and fan.

3.6.6 With the operating conditions of the refrigerating unit reached the steady state, the inside and outside temperatures, as well as the power consumed by the heater and fan shall be recorded at not more than 30 min intervals.

The temperature values shall meet the requirements of 3.5.4 and the heat transfer shall be determined by the formula (3.5.3).

3.7 INSPECTIONS

A thermal container shall be subjected to inspections specified in 3.17 of Part II "General Cargo Containers".

4. MARKING

4.1 IDENTIFICATION PLATES

4.1.1 The refrigerating and/or heating units shall bear at a conspicuous place: a manufacturer's plate containing technical particulars of the unit and a plate for entering the examination dates of the unit.

4.2 ADDITIONAL MARKING

4.2.1 Thermal containers shall be marked in accordance with the requirements set out in Section 4 of Part I of the present Rules, and in addition to that the following data shall be permanently marked on the outer surface of container side walls in the national and the English languages:

coefficient of heat transfer,

minimum and maximum inside temperatures.

4.2.2 If a thermal container is fitted with equipment for hanging cargo, the maximum carrying capacity of that equipment shall be plainly marked inside the container.

4.3 INSTRUCTIONS

4.3.1 In immediate proximity to the switches, controls and indicating devices of the refrigerating and/or heating units there shall be posted the operation instructions so arranged and fastened as to make them fit for continuous use. These instructions shall be written both in the national and the English languages.

PART IV. TANK CONTAINERS

1 GENERAL

1.1 APPLICATION

1.1.1 The provisions of the present Part of the Rules apply to tank containers designed for the transport of pressurized liquids and liquified gases.

1.1.2 Tank containers shall comply with the provisions of Part I "Basic Requirements" of the present Rules, Directives for the Design, Manufacture, Service and Repair of Pressure Vessels for the Storage and Transport of Dangerous Goods and the present Part of the Rules.

1.1.3 Tank containers differing in design and dimensions from those defined in this Part, including swap tanks and offshore tank containers, as well as tank containers designed for the transport of pressurized bulk cargoes are subject to special consideration of the Register in each particular case.

1.1.4 Additional international and national requirements specified by competent authorities may apply to tank containers used for the transport of dangerous goods.

1.2 DEFINITIONS AND EXPLANATIONS

1.2.1 For definitions and explanations referring to general terms of the Rules, see Part I "Basic Requirements". For the purpose of this Part, the following definitions apply:

Tank container means a container having a framework (frame members), a tank or tanks complete with associated fittings and other devices according to the requirements of this Part either for gravity or pressure discharge.

Tank means a strong and tight vessel with a manhole (manholes) for inspection and openings for fittings and control devices.

Note. Tanks designed for the transport of cryogenic products may have no manholes for inspection.

Compartment means a fluid tight section of the tank formed by the shell, ends and/or tight partitions.

Non-dangerous goods are those substances which are not covered by the Code of the UN Committee of Experts on the Transport of Dangerous Goods or national normative documents.

Dangerous goods are those substances which are covered by the Code of the UN Committee of Experts on the Transport of Dangerous Goods and/or the national normative documents. The degree of hazard of the cargo intended for transport in a tank container will be specially considered by the Register in each particular case.

Gas means a gas or vapour with vapourization pressure of more than 0,3 MPa (absolute) at 50°C.

Liquid means a substance with vapourization pressure of not more than 0,3 MPa (absolute) at 50°C.

Maximum allowable working pressure means a pressure (gauge) to be defined as the highest pressure of the following values:

the maximum allowable filling and draining pressure;

the maximum pressure which can be built up in the tank under the effect of the cargo contained in the tank (including foreign gases which can be present therein);

Design pressure is the pressure used for strength calculation.

Test pressure is the inside gauge pressure which is built up in the tank in the course of hydraulic testing. The test pressure is measured in the top part of the tank.

Total capacity means that volume of water which will completely fill the tank at +20°C.

Ullage means the portion of the total capacity of the tank not occupied by its cargo, expressed as a percentage of the total capacity.

Low-carbon steel means steel with the minimum assured tensile strength R_m equal to 370 MPa and the minimum assured elongation A_5 equal to 27%.

1.3 SCOPE OF SUPERVISION

1.3.1 Technical supervision of the Register shall cover:

.1 framework, frame members (bearing structure);

.2 corner fittings;

.3 tank (including tank material);

.4 pressure units, cooling and heating appliances for cargo, if provided;

.5 safety devices (pressure-relief valves, frangible disks, fusible elements and vacuum valves);

.6 piping;

.7 stop valves;

.8 liquid level indicators.

1.4 TECHNICAL DOCUMENTATION

1.4.1 As far as tank containers are concerned, the technical documentation stated in 1.3, Part I "Basic Requirements" shall comprise:

.1 specification of tank container including its purpose, the materials used and their strength data, welding consumables, types of welded joints and quality control methods;

.2 calculations of the framework (frame members) and tank, including calculations using finite element method, and calculations of safety devices, piping and ullage space;

.3 list of cargoes which may be carried in the tank container and certificates confirming resistance of the metallic and non-metallic materials of the tank container to the effects of substances intended for carriage;

.4 test program of tank containers and test procedures with detailed description of dynamic test (impact test);

.5 operation instruction in the national and the English languages;

.6 drawings of the following parts, assemblies and general views, inclusive of the specified dimensions:

corner fittings;

framework (corner posts, attachments of the tank to the framework, top and bottom side and end rails, walkways and ladders);

tank or tanks;

hatch and manhole covers;

safety devices;

stop valves;

liquid level indicators;

piping;

refrigerating and/or heating appliances of cargo;

details covered by the requirements of the CCC Convention;

CSC and CCC Plates;

plate bearing the particulars of tank;

plate bearing the operation instruction;

general views of the container and its marking including markings of the fittings.

.7 summary table of welded joint types and their structural elements;

chart and table for welded joint quality inspection.

The extent of above documentation is the minimum required.

2 TECHNICAL REQUIREMENTS

2.1 BASE STRUCTURE

2.1.1 When the tank container is loaded to its gross mass R, no part of the tank vessel and its associated shell fittings should project downwards below a plane, 25 mm above the base plane (bottom faces of the bottom corner fittings).

2.1.2 All tank containers, other than 1CC, 1C, 1CX, 1D and 1DX, shall have load-transfer areas in their base structure to permit vertical load transfer when carried on chassis. 1CC, 1C and 1CX tank containers may have load-transfer areas in their base structure as an optional feature. If so, these tank containers shall meet the requirements of 2.3, Part I of the present Rules.

2.2 TANKS

2.2.1 The tanks shall be designed and constructed in accordance with the national and/or international standards and these Rules. The calculation methods shall be subject to special consideration of the Register.

2.2.2 A tank or tanks shall be firmly secured to structural elements of the tank framework. Supports and attachments of the tank to the framework shall be such as not to cause dangerous local stress concentrations in the tank shell.

2.2.3 The tank, supports and attachments shall be designed to withstand the effects of inertia of the cargo in the tank resulting from the motion of transport means. Designing the tanks for the transport of dangerous goods, the inertial effects must be taken to be equivalent to loadings of Rg laterally, $4Rg$ longitudinally and $2Rg$ vertically. For tanks intended for non-dangerous goods, the inertial effects must be taken to be equivalent to loadings of 2Rg longitudinally, Rg laterally and 2Rg vertically.

2.2.4 The following safety factors used for determining of allowable stress shall be provided at each of the above loadings:

for metals with a distinct yield plateau: safety factor of 1,5 with respect to the minimum assured yield point;

for metals with a non-distinct yield plateau: safety factor of 1,5 with respect to the assured conventional yield point R_{p1} for steels of austenitic class or $R_{p0,2}$ for steels of other classes.

At the loading of 4g, the safety factor used for determining of allowable stress shall be taken equal to 1 with respect to the minimum assured yield point or R_{p1}, $R_{p0,2}$.

2.2.5 The minimum thickness of shell and heads in a tank constructed of low-carbon steel shall be not less than 5 mm with $D_{ins.} < 1800$ mm and 6 mm with $D_{ins.} \geqslant 1800$ mm ($D_{ins.}$ = inside diameter of the tank).

2.2.6 In a case where provision is made for an additional tank protection and hydraulic test pressure is less than 0,265 MPa, the minimum thickness of shell and heads in a tank constructed of low-carbon steel, may be reduced but shall not be less than 3 mm with $D_{ins.} < 1800$ mm and 4 mm with $D_{ins.} \geqslant 1800$ mm. The additional protection may be afforded by:

continuous outer multiply protection of "sandwich" type;

or double-wall construction of the tank,

or mounting of the tank in a full scantling framework.

2.2.7 For specific dangerous goods the minimum thickness of shell and heads in a tank constructed of low-carbon steel shall be increased subject to special consideration of the Register.

2.2.8 The minimum thickness of shell and heads in a tank intended for dangerous goods, constructed of the materials other than low-carbon steel, shall be determined from the formula

$$S_1 = \frac{21{,}4 S_0}{\sqrt[3]{R_{mi} A_5}}$$

where S_0 = minimum thickness of shell and heads in tanks constructed of low-carbon steel, mm;

S_1 = specified equivalent of the material used for construction of the tank, mm;

A_5 = minimum assured elongation of the metal at the tensile test, % (obtained on a standard five-fold specimen);

R_{mi} = minimum assured tensile strength of the material at the tensile test, MPa.

2.2.9 In any case the minimum thickness of shell and heads in a tank shall be not less than 3 mm, regardless of the material used for its construction.

2.2.10 Corrosion allowances shall be accepted in accordance with the requirements of the national and/or international standards and shall be in each case specially considered by the Register.

2.2.11 The materials used for the manufacture of components parts and assemblies which are in contact, or may come in contact, with the cargo carried in the tank container shall be resistant to the effects of that cargo.

2.2.12 A tank may be constructed of composite materials on condition that the thickness of its shell and heads is specially considered by the Register in each case.

Use of nonmetallic (polymer) composite materials for the tanks shall be guided by the normative-methodical instructions of the Register, if not otherwise stated.

2.2.13 Tanks or tank compartments with no vacuum relief devices shall be so constructed as to withstand an external pressure of at least 0,04 MPa above the internal pressure without permanent deformation and abnormalities which may render the tank container unfit for the designed purpose.

2.2.14 The ullage space for a tank for liquids is to be determined depending on the kind of cargo carried; it shall, however, be minimum 2,5 per cent of total capacity at the environment temperature of 50°C. In no case shall the tank be liquid-full at the environment temperature of 55°C. For tanks intended for the transport of gases, the maximum mass of liquefied gas per litre of tank capacity shall not exceed the density of the liquefied gas at 50°C multiplied by 0,95. Furthermore, the tank shall not be liquid-full at 60°C.

2.2.15 Tanks of more than 13500 l in capacity, intended for the transport of liquids with kinematic viscosity of no more than 2600 cSt, shall be subdivided by baffle plates into sections with maximal capacity of 7500 l if the tank is not filled to 80% of its total capacity.

2.2.16 Tanks designed for the transport of specific dangerous goods shall have no openings located below the level of liquid.

2.2.17 Weld joints of tanks shall be inspected by radiography or some other method approved by the Register, to the extent agreed with the Register.

2.3 ARRANGEMENT OF OPERATIONAL EQUIPMENT

2.3.1 The operational equipment (stop valves, safety devices, manholes, instruments etc.) shall be so arranged as to prevent it from being broken away or damaged while in use. Leak-proofness of the operational equipment shall be maintained even if the tank container is tipped over.

2.3.2 Safety devices of tanks for the transport of dangerous goods.

2.3.2.1 Each tank or tank compartment is to be provided with at least one spring type pressure-relief valve and may be additionally fitted with a frangible disk — or a fusible element arranged parallel to the spring pressure-relief valve, with the exception of cases specified in 2.3.2.6 and for tanks intended for gases. The safety devices shall be arranged in the vapour space in the top of the tank as near as possible to the tank's mid-length.

2.3.2.2 The pressure at which the spring pressure-relief valve is to begin opening shall be at least 100% and at most 125% of the maximum allowable

working pressure and shall be a matter of special consideration by the Register in each case. Upon release of pressure the spring pressure-relief valve shall close at a pressure of at least 10% below the pressure at which the valve begins opening and shall remain closed under all lower pressures.

2.3.2.3 Frangible disks arranged parallel to the spring pressure-relief valves shall rupture at a pressure equal to the hydraulic test pressure.

2.3.2.4 Fusible elements shall melt within the temperature range from 110 to 149°C provided that the pressure which is built up in the tank at the melting temperature of the fusible element shall not exceed the test pressure. A fusible element shall have no thermal insulation or screen.

2.3.2.5 The total discharge capacity of the safety devices of a tank for liquid shall be such that under no conditions the pressure in tank exceeds the pressure at which the safety device comes into action by more than 20%. The total discharge capacity of the spring pressure-relief valves of a tank for gas shall be such that under no conditions the pressure in tank exceeds the maximum allowable working pressure by more than 10%.

The calculation of the discharge capacity and discharge area will be specially considered by the Register in each particular case.

2.3.2.6 Tanks intended for the transport of specific dangerous goods shall be provided with safety devices including frangible disk located ahead of the spring type pressure-relief valve. A pressure gauge or another indicator of the disk integrity shall be arranged between the frangible disk and the valve. The frangible disk in this case shall rupture at a pressure by 10% greater than the pressure at which the pressure-relief valve begins opening. Use of such devices shall be a matter of special consideration by the Register in each particular case.

2.3.2.7 Stop valves shall not be installed between the safety device and the tank.

2.3.2.8 Safety devices are to be so constructed as to prevent any change of their setting without the knowledge of authorized persons.

2.3.3 Pressure-relief valves of tanks intended for non-dangerous goods.

2.3.3.1 The tank containers intended for the transport of non-dangerous goods may be provided with a safety device consisting in one frangible disk.

2.3.3.2 The pressure-relief valves are to be so designed as to begin opening at maximum allowable working pressure and to be fully open at a pressure exceeding the pressure at which the valves begin opening, by not more than 10%.

2.3.3.3 The pressure-relief valves shall have a clear area of discharge, when fully open, sufficient to provide the minimum pressure relief capacity according to Table 2.3.3.3.

Table 2.3.3.3

Minimum pressure-relief capacity	Designation of tank-container				
	1AA	1A, 1AX	1BB, 1B, 1BX	1CC, 1C, 1CX	1D, 1DX
dm^3/s m^3/min	106 6,4	95 5,7	80 4,8	63 3,8	47 2,8

2.3.4 Vacuum valves are to be constructed in a way as to permit being set to internal pressure considering the kind of cargo carried, but in any case not below 0,021 MPa. If flammable substances are carried, the vacuum valves shall be fitted with flame trap.

2.3.5 Closing fittings and operation equipment.

2.3.5.1 All openings in tanks, except those for safety devices, thermometers, instruments and inspection holes, are to be provided with stop valves. The outlet flanges of stop valves are to have removable means of closing (end caps etc.). The stop valves with screwed stems shall be closed by clockwise motion of the handwheel. "Open"/"Closed" position indicator shall be provided on the valve or close by.

2.3.5.2 The tank containers with bottom discharge for the dangerous goods specified in valid normative documents, shall be equipped, as a minimum, with two shut-off devices arranged independently of one another and in series, namely:

.1 an external stop valve fitted as close to the tank as reasonably practicable;

.2 a sluice valve or a bolted blank flange, or a screwed cover, which will be installed on the outer flange of the external valve.

2.3.5.3 The tank containers with bottom discharge for the dangerous goods specified in valid normative documents shall be equipped with three shut-off devices arranged independently of one another and in series, namely:

.1 a self-closing internal stop valve within the tank or within a flange welded to the tank or within a union being a part of the tank. The valve shall remain closed (operable) when subjected to impact or other inadvertent act. The valve may be operable from above and below; the "Open"/"Closed" position shall be controlled, whenever possible, from below. Moreover, it should be possible to close the valve from an accessible position of the tank container that is remote from the valve itself;

.2 an external stop valve;

.3 a shut-off device in accordance with 2.3.5.2.2 installed on the outer flange of the external valve.

2.3.5.4 The discharge (filling) openings for specific dangerous goods shall be located above the load level.

2.3.5.5 The tank containers may be equipped with level indicators the construction of which is

subject to special consideration by the Register in each particular case.

The tank containers intended for carriage of liquid gas shall be equipped with level indicators.

2.3.5.6 To permit inspection, repair and other works, the tanks shall have manholes not less than 500 mm in diameter. The covers of manholes are to be secured in an effective manner. The tightness shall be ensured by gaskets resistant to effects of the cargo carried and climatic conditions.

2.3.5.7 The bursting strength of all piping and pipe fittings should be at least four times the strength at the maximum allowable working pressure of the tank and at least four times the strength at the pressure to which it may be subjected in service by the action of a pump or other device (exept pressure-relief valves) the action of which may subject portion of the piping to pressures greater than the tank maximum allowable working pressure. Suitable provisions should be made in every case to prevent damage to piping due to thermal expansion and contraction, jarring and vibration.

2.3.5.8 All valves and fittings are to be located as near the tank as practicable and shall have additional external protection from mechanical damage and shall be grouped in a minimum number of positions on the tank.

2.3.5.9 The tanks and framework shall be adequately earthed.

2.3.5.10 The tank container or each compartment thereof shall be equipped with the pressure gauges connected with the vapour space of the container or compartments. A stop valve shall be fitted between the pressure gauge and tank.

2.3.6 Sealing materials.

Materials used for sealing of hatches and operational equipment shall be elastic, fast and wear resistant at variations of ambient temperature in the conditions of the container operation and also resistant to the cargoes transported.

2.4 ADDITIONAL INSTALLATIONS

2.4.1 The refrigerating and/or heating units, if provided for tank containers, shall conform to the requirements of Part III "Thermal Containers".

3 TESTING

3.1 GENERAL

3.1.1 The requirements of the present Section apply to tank containers of all designations, irrespective of their construction and material involved.

3.1.2 To achieve the specified test loadings, the tank shall be loaded with a suitable liquid. If the test loading cannot be met or the liquid is undesirable for use, the tank shall be loaded with another liquid with application of a supplementary loading so that the specified value of test loading is reached. The non-uniformity in distribution of test loading shall not exceed 20%.

3.1.3 Upon completion of each test, the tank container shall show neither permanent deformations nor abnormalities which will render it unsuitable for the designed purpose.

3.1.4 Test loadings and testing procedures for lifting, stacking, longitudinal restraint are specified in Section 3 of Part II "General Cargo Containers". The stacking test shall be performed with the tank completely loaded with water.

3.2 WALKWAYS STRENGTH

3.2.1 The tank container has no internal loading. The test is carried out by the application of external force represented by a load of 3 kN uniformly distributed over an area of 600×300 mm. This load shall be applied vertically downwards to the outside of the walkways, at the weakest area of same.

3.3 LADDER STRENGTH

3.3.1 The tank container has no internal loading. The test is carried out by the application of external force represented by a concentrated load of 2 kN. This load shall be applied vertically downwards to the middle of each rung.

3.4 LONGITUDINAL INERTIA TEST

3.4.1 The tank container having a uniformly distributed internal loading so that the combined mass of the container and test load is equal to *R*, shall be positioned with its longitudinal axis vertical.

Note. The internal loading may be applied to the tank container after it is in vertical position.

This test is not required for containers without longitudinal frames.

One pair of the bottom corner fittings at the lower end shall be restrained in this position against lateral and vertical shifting. The other pair of fittings at the upper end shall be restrained against lateral shifting only.

Depending on construction of the tank container, subject to agreement with the Register, other container positioning scheme may be used.

For testing of the opposite end, the tank container shall be turned to 180° about its vertical axis so that the pair of bottom corner fittings that were at the upper end, are at the lower end.

Restraint is provided in similar manner.

The tank container is held in this position, for each end, for at least 5 min (Fig.3.4.1).

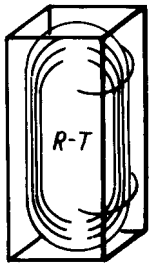


Fig. 3.4.1 Longitudinal inertia test

During the test, after a lapse of 5 min, there shall be identified damages and deformations of the tank, its fittings and framework.

3.5 LATERAL INERTIA TEST

3.5.1 The tank container having a uniformly distributed internal loading so that the combined mass of the container and test load is equal to *R*, shall be positioned with its transverse axis vertical.

Note. The internal loading may be applied to the tank container after it is in lateral position. This test is not required for containers without longitudinal frames.

One pair of the bottom corner fittings at the lower side shall be restrained in this position against lateral and vertical shifting. The other pair of fittings at the upper side shall be restrained against lateral shifting only.

Depending on construction of the tank container, subject to agreement with the Register, other container positioning scheme may be used.

For testing of the opposite side, the tank container shall be turned to 180° about its vertical axis so that the pair of bottom corner fittings that were at the upper side, are at the lower side.

Restraint is provided in similar manner.

The tank container is held in this position, for each side, for at least 5 min (Fig.3.5.1).

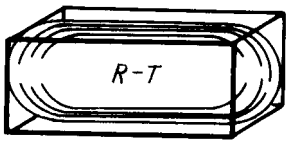


Fig. 3.5.1 Lateral inertia test

During the test, after a lapse of 5 min, there shall be identified damages and deformations of the tank, its fittings and framework.

3.6 LOAD-TRANSFER AREA TEST

3.6.1 A tank container filled with water to a mass 2R-T shall be placed on four supports in such a way that two supports are against the external contact areas and two — against the internal ones (see 3.6.1). Each of the supports shall have a bearing surface of 150 mm × 150 mm. The container shall be under load during 5 min. An identical test shall be carried out for the second pair of contact areas. In case where the contact areas of a tank container are arranged symmetrically only one pair of contact areas shall be subjected to the test. Damages and deformations of the tank, its fittings and framework shall be identified during the test after a lapse of 5 min.

3.7 DYNAMIC TEST

3.7.1 A tank container filled with water to its gross mass *R* shall be placed on a vehicle (truck, platform, etc.). The vehicle, with laden tank container secured to it, is moved with a specific speed and is directed towards a massive obstacle the mass of which shall be

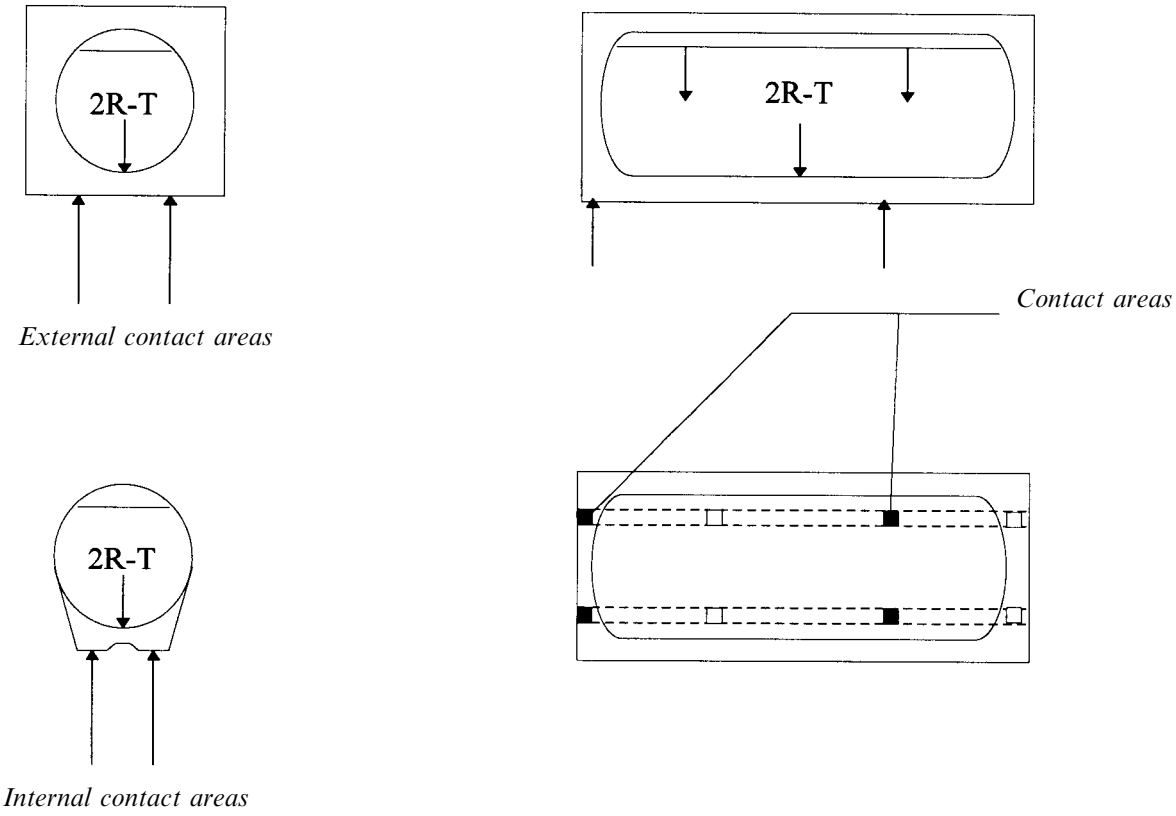


Fig. 3.6.1 Load-transfer area test

not less than the gross mass + mass of the vehicle. When striking against the obstacle the tank container intended for the transport of dangerous goods, under the specified conditions, shall experience an acceleration of 4*g* while the tank container for non-dangerous goods, an acceleration of 1*g*.

If the loading of a water filled tank is less than *R*, the speed of the vehicle is to be increased to a value such as to meet the following equality:

$$a_1 = aR/R_1,$$

where a — acceleration required by the Rules of the Register (4g or 2g);
R — design gross mass of the tank-container;
R_1 — gross mass of the water filled tank-container;
a_1 — aceleration which shall be experienced by the tank-container with a gross mass R_1

After striking damages and deformations of the tank, its fittings and framework shall be identified.

Other methods of dynamic test may be used on agreement with the Register.

3.8 PRESSURE TEST AND LEAKPROOFNESS TEST

3.8.1 The pressure test shall be carried out after the completion of the test described in 3.1 — 3.7.

3.8.2 Each tank container shall be subjected to pressure test before insulation, if any, and protective coverings are applied. Shot-blasting or other surface treatment, if envisaged, shall be carried out prior to pressure test.

3.8.3 Pressure and vacuum relief valves shall be removed prior to beginning the pressure test.

3.8.4 A tank container having the maximum allowable working pressure of not more than 0,7 MPa, shall be subjected to a hydraulic pressure test of 1,5 times the maximum allowable working pressure but not less than 0,045 MPa. A tank container having the maximum allowable working pressure of not less than 7 MPa, shall be subjected to a hydraulic pressure test of 1,3 to 1,5 times the maximum allowable working pressure. The above coefficients are subject to special consideration by the Register. The test pressure shall be maintained for the period of time necessary to enable a complete inspection of the tank and its fittings to be made but not less than 30 min. The tank testing procedure different from that set forth in this paragraph shall be subject to a special consideration of the Register.

3.8.5 Where the tank is provided with compartments, each compartment shall be tested. In this case compartments adjacent thereto shall be empty and the pressure in the compartments shall correspond to the atmospheric.

3.8.6 The test pressure shall be measured at the top of the tank or compartment; with the tank in its normal operational position.

3.8.7 The stresses arising in shell and heads of the tank under hydraulic test shall not exceed $0,75Re$ ($0,75R_{p0,2}$, $0,75R_{p1}$) or $0,5R_m$, whichever is lesser.

Note. Definitions of R_e, $R_{p0,2}$ and R_{p1} are given in 2.2.4.

For metals characterized only by the minimum assured tensile strength, stresses shall not exceed $0,375R_m$.

3.8.8 If the results of hydraulic test are satisfactory, the tank assembled with operational and safety fittings shall be subjected to leakproofness test. The test is performed using pressurized air. The test pressure shall be taken with regard to the standing safety requirements relevant to the test location and shall be 0,25 — 0,9 times the maximum allowable working pressure, subject to special consideration by the Register in each particular case. Other tank leakproofness test procedures may be used, subject to Register approval.

3.8.9 The refrigerating and/or heating systems, if provided for the tank container, shall be tested by hydraulic pressure equal to 1,5 times the working pressure of the system. Duration of the test shall be such as is necessary for the system to be thoroughly inspected.

3.8.10 Where a tank container is not equipped with a vacuum valve or a frangible disk is placed ahead of the pressure relief valve, the tank shall be tested for vacuum equal to 0,04 MPa.

3.9 TESTING OF PRESSURE-RELIEF AND VACUUM VALVES

3.9.1 During testing of the pressure-relief valves the following parameters shall be determined:

.1 opening pressure of the valve;

.2 discharge capacity with the valve being fully open (at the prototype test);

.3 closing pressure of the valve.

3.9.2 The vacuum valves shall be tested for opening pressure.

3.10 INSPECTIONS

3.10.1 A tank container shall be subjected to inspections according to 3.17 of Part II "General Cargo Containers".

4 MARKING

4.1 TARE MASS

4.1.1 Tare mass to be marked on each tank container during manufacture shall be obtained by weighing each tank container as a complete unit after it has been painted. The actual tare mass shall lie within the limit of tolerances stated in the approved technical documentation.

4.2 IDENTIFICATION PLATE

4.2.1 A plate shall be permanently attached to the tank container framework, in addition to the CSC and CCC Plates, for the indication of at least the following data:

country of manufacture;

country of approval;

number of the Certificate of Conformity of the Prototype Tank Container (Type Approval Number);

type of tank according to the classification of the International Maritime Dangerous Goods Code (IMO tank type No.);

manufacturer's name;

name of the tank container model;

date of manufacture;

serial number of tank;

maximum allowable working pressure, MPa;

test pressure, MPa;

capacity at 20°C, l;

tank design standard (code);

design temperature, °C;

equivalent thickness of tank walls in mild steel, mm;

tank material;

rated thickness of tank walls, mm;

capacity of each compartment if the tank consists of compartments;

maximum allowable working pressure of steam heaters, if used, MPa;

protective covering of tank inner surface, if applied;

date of first hydraulic test and brand of the surveyor to the Register;

dates of subsequent hydraulic tests and examinations.

4.2.2 A blank space shall be provided on the plate for entering the dates of subsequent hydraulic tests, as well as for putting the Register's brand.

4.2.3 The data marked on the plate shall be embossed on, or indicated on its surface in any other conspicuous way.

4.2.4 The plates shall be fabricated of corrosion-resistant and incombustible material. The letters shall be not less than 3 mm in height.

4.2.5 The plate shall be affixed as near as possible to the CSC Table (see 4.1 of Part I "Basic Requirements").

4.3 FITTINGS

4.3.1 All the fittings shall have inscriptions showing the intended purpose of the fitting concerned.

4.3.2 The vacuum relief valve shall bear the marking of the pressure to which it is set.

4.3.3 The pressure-relief valve shall be marked with following data:

.1 pressure at which the valve starts to open, MPa or bar;

.2 air capacity at 15°C with the valve being fully open, m^3/h;

.3 manufacturer's name and identification number;

.4 Register's brand;

.5 Register's seal.

4.3.4 Safety devices (frangible disks, fusible elements) shall be plainly and permanently marked with the pressure or temperature at which they are set to operate, and such other markings as may be required by the Register.

4.4 INSTRUCTIONS

4.4.1 In immediate proximity to discharge/loading valves, a plate with the operation instructions made so as to be fit for continuous use shall be attached to the tank container at a readily visible place. The instructions shall be written both in the national and the English languages.

PART V. PLATFORM CONTAINERS

1 GENERAL

1.1 APPLICATION

1.1.1 The provisions of the present Part of the Rules apply to 1AAA, 1AA, 1A, 1AX, 1BBB, 1BB, 1B, 1BX, 1CC, 1C, 1CX platform containers.

1.1.2 Platform containers shall comply with requirements of Part I "Basic Requirements" as applied to the platform containers, and with requirements of the present Part of the Rules.

1.2 DEFINITIONS AND EXPLANATIONS

1.2.1 For definitions and explanations referring to general terms of the Rules, see Part I "Basic Requirements". For the purpose of this Part, the following definitions apply:

Platform (container) means a container having only a base with floor and equipped with top and bottom corner fittings.

Platform-based containers (platform containers), groupped as follows:

platform-based container with incomplete superstructure and fixed ends is a container having a base with floor and non-folding ends equipped with top corner fittings; longitudinal members between the ends other than at the base are not provided;

platform-based container with incomplete superstructure and folding ends is a container having a base with floor and folding ends equipped with top corner fittings; longitudinal members between the ends other than at the base are not provided;

platform-based container with complete superstructure is a container having a base with floor, top side rails and the ends equipped with top corner fittings, roof or open top.

Folding ends of a platform-based container mean the structures which may be laid on the floor for the purpose of transportation or stowage of empty containers.

Interlocking devices of platform-based container with folding ends are devices securing the end structure in vertical position, as well as those interconnecting empty containers in folded condition to form an interlocked pile (module).

1.3 SCOPE OF SUPERVISION

1.3.1 Technical supervision of the Register shall cover:

.1 base structure with floor;

.2 corner fittings;

.3 end structure of platform-based containers;

.4 locking devices of end structure;

.5 framework.

1.4 TECHNICAL DOCUMENTATION

1.4.1 For platform containers, the technical documentation stated in 1.3.3 of Part I "Basic Requirements", shall comprise:

.1 specification of the container;

.2 test program and test procedure for the containers;

.3 State Health Authorities approval of the coverings, the floor material with antiseptic impregnation, and the sealants;

.4 drawings of the following parts, assemblies and general views, inclusive of the specified dimensions:

corner fittings;

bottom side rails;

bottom end rails;

corner posts, if any;

base structure with corner fittings, and the gooseneck tunnels;

end walls, if provided;

hinges and locking devices of end walls, in case of folding end structure;

interlocking devices connecting empty containers to form a pile (module) — only for platforms (containers) without end structure and platform-based containers with folding ends;

securing devices for cargo;

floor (fastening, caulking, size of panels and boards, construction of planking);

CSC Plate;

framework;

general views and markings of platform containers.

The extent of above documentation is the minimum required.

2 TECHNICAL REQUIREMENTS

2.1 DIMENSIONS

2.1.1 The dimensions of the base (width W and length L) for platform containers of all types are to comply with those shown in Table 2.1.2, Part I "Basic Requirements".

2.1.2 The length L of empty platform-based containers with fixed and folding ends, taken between the top corner fittings of the ends in erected position, may coincide with the figures shown in Table 2.1.2.

Table 2.1.2

Designation	L_{max} of empty container, mm	L_{min} of container laden to gross mass R, mm
1AAA, 1AA, 1A, 1AX	12202	12172
1BBB, 1BB, 1B, 1BX	9135	9105
1CC, 1C, 1CX	6068	6042
Note. Using L_{max} and L_{min} is not recommended.		

2.1.3 No part of the container shall project beyond the external dimensions given in Table 2.1.2 for platform containers with incomplete superstructure and in Table 2.1.2, Part I "Basic Requirements" for the rest of platform containers.

2.1.4 Series 1 platform containers with the ends of a height other than specified in Table 2.1.2, Part I "Basic Requirements" are to be specially considered by the Register in each particular case.

2.2 END STRUCTURE

2.2.1 The ends of platform-based containers with fixed or folding ends may be interconnected by top rails or be constructed with no top rails as free-standing posts.

2.2.2 The ends designed with a top rail between them may be constructed as end walls.

2.2.3 Platform-based containers with folding ends shall be equipped with appropriate devices securing the top corner fittings at each end in folded condition to permit stacking, as well as with interlocking devices connecting empty containers with folded ends to form a module; the face supporting the upper container when stacking or forming a module shall protrude minimum 6 mm above the top of container in folded condition.

2.2.4 Any extending parts of the platform-based containers which in service may cause a dangerous situation to occur shall be equipped with fixing devices with external indication of the fixed position.

2.3 BASE STRUCTURE

2.3.1 The base structure shall be equipped with devices for securing the cargo (hooks, shackles, rings, etc.) so arranged as not to protrude above the face of floor and beyond the overall dimensions of the platform container. These devices shall be capable of withstanding the forces induced by longitudinal and lateral loads, unless other means of securing the cargo are provided.

2.3.2 The distance between the face of floor and the plane formed by upper faces of top corner fittings shall be not less than 6 mm.

2.3.3 Structural deflection in the base of unladen container is permitted.

3 TESTING

3.1 GENERAL

3.1.1 The provisions of this Section apply to platform containers specified in 1.1; irrespective of design and material involved.

3.1.2 Upon completion of each test, the platform containers shall show neither permanent deformations nor abnormalities which may render them unsuitable for the designed purpose.

3.1.3 A platform-based container with incomplete superstructure and folding ends shall have the ends in erected (service) condition.

3.2 STACKING

3.2.1 The test load and the stacking test procedure for platform containers are set out in 3.7, Part II "General Cargo Containers". The platforms shall be tested without internal loading while the platform-based containers shall have uniformly distributed internal loading such that the combined mass of the container and the test load is equal to $1{,}8Rg$.

3.3 LIFTING

3.3.1 The platform container under test shall have a uniformly distributed internal loading such that the combined mass of the container and test load is equal to $2Rg$.

3.3.2 When the container is lifted by the top corner fittings, the lifting devices shall be secured through the side apertures in such a way that the line of action of the lifting force is upright.

After lifting the container shall be suspended for 5 min and then carefully lowered to the ground.

3.3.3 When the container is lifted by the bottom corner fittings, the lifting devices shall be secured in such a way that the line of action of the lifting force and the outer face of the corner fitting shall be no further apart than 38 mm, with the lifting force applied at an angle to the horizontal of:

30°, for 1AAA, 1AA, 1A and 1AX containers;

37°, for 1BBB, 1BB, 1B and 1BX containers;

45°, for 1CC, 1C and 1CX containers.

After lifting the container shall be suspended for 5 min and then carefully lowered to the ground.

3.4 RACKING

3.4.1 A platform is not to be subjected to racking test.

3.4.2 The test load and racking test procedure for platform-based cointainers with incomplete structure and fixed or folded ends, as well as for containers with complete superstructure, are set out in 3.10 and 3.11, Part II "General Cargo Containers".

3.4.3 When testing for longitudinal racking of platform-based containers with incomplete superstructure, external forces equal to 150 kN are to be distributed in the ratio 2:1 (75 and 50 kN) between each of the top corner fittings: at first, towards and then away from the corner fittings. The lesser force shall be applied to the side of vertical restraint.

During the test the measurements shall be taken to determine vertical movement of the top with respect to the base, which shall not exceed 42 mm.

3.4.4 Prior to testing for transverse racking of platform-based containers with incomplete superstructure and fixed and folding ends constructed as corner posts, the top corner fittings at each end may be interconnected by a top rail used for this test only. In such case, external forces equal to 150 kN shall be applied simultaneously to each of the top corner fittings on one side of the container.

If the corner posts are not interconnected by the top rail, external forces equal to 75 kN shall be applied separately to each top corner fitting.

In the course of testing the changes in lengths of the diagonals, the sum of which shall not exceed 60 mm, shall be measured.

3.5 END WALL STRENGTH

3.5.1 Subject to this test are the platform-based containers with complete superstructure, as well as those having incomplete superstructure and fixed and folding ends constructed as end walls.

3.5.2 The test load and the procedure of testing for end wall strength are set out in 3.13, Part II "General Cargo Containers".

3.6 LONGITUDINAL RESTRAINT (STATIC TEST)

3.6.1 The test load and the procedure of testing for longitudinal restraint of platform containers of the specified types are set out in 3.12, Part II "General Cargo Containers".

3.7 FLOOR STRENGTH

3.7.1 The test load and the procedure of testing for floor strength of platform containers are set out in 3.9, Part II "General Cargo Containers".

3.8 ADDITIONAL TESTS FOR PLATFORM-BASED CONTAINERS WITH INCOMPLETE SUPERSTRUCTURE AND FOLDING ENDS

3.8.1 Stacking of containers in folded condition.

3.8.1.1 The test should be carried out to prove the ability of a platform-based container with folded ends to support under acceleration conditions the total mass of stacked containers of the same length as the platform container, loaded each to the mass R, account being taken of the relative eccentricities between the containers due to clearances.

3.8.1.2 External forces mentioned in 3.7, Part II "General Cargo Containers" should be applied vertically and simultaneously to each of the four top corner fittings through test corner fittings or pads of the same plan dimensions as the top corner fittings of the container. The test corner fittings or pads should be placed in such a way with respect to the top corner fittings as to cover all positions of their offset by 25 mm laterally and 38 mm longitudinally.

3.8.2 Lifting by the top.

3.8.2.1 The test should be carried out to prove the ability of the platform container and its interlocking devices (see 2.2.3) to withstand the action of vertically applied forces when forming a modular groups of folded empty containers.

3.8.2.2 The platform container with folded ends shall be subjected to a loading equal to $(2N-1)T$ on each interlocking device (where N = number of containers in modular group, T = tare mass, kg) and shall be carefully lifted by all four top corners in a way as to avoid significant acceleration forces being created.

3.9 INSPECTIONS

3.9.1 The platform containers of the specified types shall undergo the inspections stated in 3.17, Part II "General Cargo Containers" in so far as these inspections are applicable.

PART VI. NON-PRESSURIZED BULK CONTAINERS

1 GENERAL

1.1 APPLICATION

1.1.1 The provisions of the present Part of the Rules apply to containers intended for the transport of non-pressurized solid bulk cargoes.

1.1.2 Bulk containers shall comply with requirements of Part I "Basic Requirements" and with requirements of the present Part of the Rules.

1.1.3 Containers intended for the transport of dangerous solids in bulk are subject to special consideration by the Register in each case.

1.2 DEFINITIONS AND EXPLANATIONS

1.2.1 For definitions and explanations referring to general terms of the Rules see Part I "Basic Requirements". For the purpose of this Part, the following definitions apply:

Non-pressurized bulk container means a container used for the transport and storage of unpackaged solid bulk cargoes, equipped with devices for gravity loading and discharge.

Non-pressurized bulk container of "box" type means a container with rectangular cargo space, provided with a door opening at least in one end wall and with gravity discharge. Such container may be used as a general cargo container.

Non-pressurized dry bulk container of "hopper" type means a container without door openings and having discharge devices arranged in horizontal plane.

Dry solids in bulk means assemblies of separate solid particles normally in contact with one another and capable of fluid flow.

Bulk density is the mass per unit volume of dry bulk solids.

Cargo capacity (body) means the space within the container bounded by the end and side walls, bottom and roof or a soft cover (tarpaulin, plastics, etc.) in case of non-hermetic containers.

1.3 SCOPE OF SUPERVISION

1.3.1 Technical supervision of the Register shall cover:

.1 framework (bearing structure);

.2 walls, floor, roof, doors and door locks for the "box" type containers;

.3 corner fittings;

.4 walls, floor, roof, loading/discharge devices for "hopper" type containers.

1.4 TECHNICAL DOCUMENTATION

1.4.1 For bulk containers, the technical documentation stated in 1.3.3 Part I "Basic Requirements", shall comprise:

.1 specification of the container;

.2 test program and test procedure for the container;

.3 State Health Authorities approval of the coverings, the floor material with antiseptic impregnation and materials;

.4 drawings of the following parts, assemblies and general views, inclusive of the specified dimensions:

corner fittings;

door locks, closures of manholes and discharge openings;

walls;

corner posts;

top and bottom side rails;

top and bottom end rails;

roof and manholes, if provided;

base structure with bottom corner fittings and gooseneck tunnel, if provided;

floor (fastening, caulking, size of panels and boards, construction of planking);

doors with their gaskets locks and closures of discharge openings, if provided in the door;

details covered by requirements of the CCC Convention;

CSC and CCC Plates;

general views and markings of the container.

The extent of the above documentation is minimum required.

2 TECHNICAL REQUIREMENTS

2.1 "BOX" TYPE CONTAINER

2.1.1 No part of the side structure of the "box" type container, when test load is applied to its side walls, shall deflect by more than 40 mm beyond a plane formed by the side faces of corner fittings.

2.2 "HOPPER" TYPE CONTAINER

2.2.1 The walls of the "hopper" type container shall be firmly connected to the structural elements of the container. Supports and attachments of the cargo body to the framework shall not cause dangerous local stress concentration in the structure.

2.2.2 The container shall be capable of withstanding the inertia forces of the cargo, resulting from the motion of the vehicle.

2.2.3 When designing the "hopper" type container the forces of inertia shall be taken to be equivalent to forces of $2Rg$ longitudinally and vertically and Rg laterally. The loads corresponding to these forces may be considered to act individually; they shall be evenly distributed and act through the geometric centre of the cargo body.

2.2.4 With the "hopper" type container being fully laden under transverse restraint test, no part of side structure shall deflect by more than 50 mm beyond a plane formed by the outer faces of corner fittings.

2.3 ADDITIONAL STRUCTURES

2.3.1 The bulk containers may be provided with fork lift pockets, grappler arm lifting areas, gooseneck tunnel, as well as with ladders and walkways.

2.3.2 The container may be provided with one or several fumigation openings fitted with flanges.

2.3.3 The "hopper" type containers shall have manholes minimum 500 mm in diameter for the purpose of inspection, repair and other works.

2.3.4 The bulk containers shall have one or more loading openings, the number, construction and arrangement of which shall be such as to permit even distribution of cargo in the cargo body. Recommended arrangement of loading openings is shown in Fig. 2.3.4.

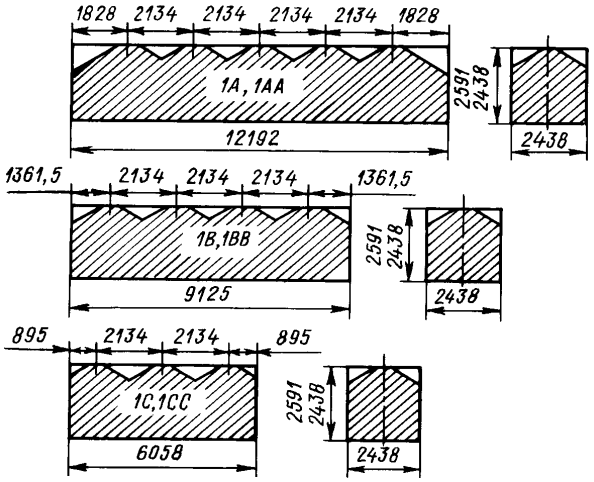


Fig. 2.3.4 Arrangement of loading openings

2.3.5 The bulk containers shall have one or more discharge openings, the number, construction and arrangement of which shall be such as to permit complete discharge of cargo by gravity or with the use of discharge devices that produce no vacuum within the cargo body.

3 TESTING

3.1 GENERAL

3.1.1 The requirements of the present Section apply to bulk containers of all designations, irrespective of their construction and materials involved.

3.1.2 To achieve the specified test loading, the container shall be loaded with suitable cargo. If the test loading cannot be met or the cargo is undesirable for use, the container shall be loaded with another cargo, with application of a supplementary loading so that the specified value of test loading is reached.

3.1.3 Upon completion of each test, the container shall show neither permanent deformations, nor abnormalities which would render it unsuitable for the designed purpose.

3.1.4 Test loadings and test procedures for lifting, stacking, strength of roof (if any), strength of floor, racking, strength of side walls, longitudinal restraint and weathertightness of "box"

type containers are set out in Section 3, Part II "General Cargo Containers".

Test loadings during end wall strength test for 1AAA, 1AA, 1A, 1AX, 1BBB, 1BB, 1B and 1BX containers shall be equal to 0,4*Pg*, while those for 1CC, 1C, 1CX, 1D and 1DX containers shall be equal to 0,6*Pg*.

3.1.5 Test loadings and procedures for walkways and ladder strength tests are set out in Section 3, Part IV "Tank Containers".

3.1.6 Test loadings and procedures for "hopper" type containers are set out in Section 3, Part IV "Tank Containers", exclusive of Chapter 3.7 "Pressure Test".

3.2 AIRTIGHTNESS TEST

3.2.1 This test shall be carried out after completion of the tests stated in 3.1.4 or 3.1.6.

3.2.2 The container shall be in operating condition. Doorways, manholes and other openings shall be closed in the normal manner.

3.2.3 Air shall be supplied to the container through a connection precluding air leakages. A pressure gauge shall be connected to the container itself. The accuracy of the gauges used shall be: for pressure gauge $\pm 5\%$, for flowmeter $\pm 3\%$.

3.2.4 A positive pressure equal to 250 ± 10 Pa shall be produced in the container. The air supplied to the container shall maintain the said pressure. The air leakage from the container shall not exceed the following values:

for 1AAA, 1AA, 1A, 1AX containers, 30 m^3/h;

for 1BBB, 1BB, 1B, 1BX containers, 25 m^3/h;

for 1CC, 1C, 1CX containers, 20 m^3/h;

for 1D, 1DX containers, 15 m^3/h.

3.2.5 This test shall be carried out, if considered necessary.

3.3 INSPECTIONS

3.3.1 A bulk container shall be subjected to inspections according to 3.17, Part II "General Cargo Containers".

4 MARKING

The rear surface of a "hopper" type container shall bear inscription showing capacity of the container in m^3.

If considered necessary, a plate with operation instructions made so as to be fit for continuous use shall be attached to the container at a readily visible place, in immediate proximity to the discharge area.

The instructions shall be written both in the national and the English laguages.

RULES FOR THE APPROVAL OF CONTAINERS FOR THE TRANSPORT OF GOODS UNDER CUSTOMS SEAL

1 GENERAL

1.1 APPLICATION

1.1.1 The present Rules apply to containers with maximum gross mass of 10 t and more, intended for international transport of goods.

1.2 DEFINITIONS AND EXPLANATIONS

1.2.1 For the purpose of the present Rules the following definition applies:

Container is an article of transport equipment:

fully or partially enclosed to constitute compartment intended for containing goods;

of a permanent character and accordingly strong enough to be suitable for repeated use;

specially designed to facilitate the carriage of goods by one or more modes of transport, without intermediate reloading.

Notes: 1. The term "container" shall include accessories and equipment appropriate for the type concerned, provided that such accessories and equipment are carried with the container.

2. The term "container" shall not include vehicles, accessories or spare parts of vehicles, as well as packaging.

1.3 APPROVAL PROCEDURES

1.3.1 General provisions.

1.3.1.1 The containers may be approved for the transport of goods under Customs seal:

.1 at the manufacturing stage, by design type (approval at the manufacturing stage);

.2 at any stage subsequent to manufacture, either individually or by batches of the same container type (approval at any stage subsequent to manufacture).

1.3.1.2 If a container no longer complies with the technical conditions prescribed for its approval, before it can be used for the transport of goods under Customs seal it shall be restored to the condition which has justified its approval so as to comply again with the said technical conditions.

1.3.1.3 If the essential characteristics of a container are changed, the container shall cease to be covered by the approval and shall be reapproved before it can be used for the transport of goods under Customs seal.

1.3.2 Procedure for approval at the manufacturing stage.

1.3.2.1 Where the approval of containers for the transport of goods under Customs seal is desired at the manufacturing stage, the manufacturer shall submit to the Register an application in writing for approval by design type.

1.3.2.2 The manufacturer shall state in his application the identification numbers and letters which he assigns to the design type of container covered by the application. The application shall be also accompanied by technical documentation (see 1.3.2.3) submitted for the approval and by an assurance in writing (see 1.3.2.5).

1.3.2.3 The technical documentation for approval of container by design type shall at least include:

.1 design specification of the container stating its construction, characteristics of materials involved, welding procedures, as well as the methods of assembling;

.2 general arrangement plans, sectional views with scantlings, assemblies and elements, with indication of places for affixing Customs seals;

.3 views of door locking devices with indication of materials involved, as well as places and methods of affixing Customs seals;

.4 sketches of the container sheet, if used, with indication of fastening methods and places for affixing Customs seals.

The above documentation shall be generally submitted in triplicate.

Any other additional documentation may be required by the Register, if considered necessary.

1.3.2.4 If necessary, the Register may require that certain changes be introduced into the container design type submitted for the approval.

1.3.2.5 The manufacturer shall assure in writing that he will:

.1 produce to the Register such containers of approved design type as he may wish to examine;

.2 permit the Register to examine further containers at any time during series production to the approved design type;

.3 advise the Register of any change, of whatever magnitude, in drawings or specifications, before proceeding with such change;

.4 affix to the container the CCC Plate with indication of all the required markings thereon (see 3.1);

.5 keep record of containers manufactured to the approved design type.

1.3.2.6 One or more containers, manufactured according to approved technical documentation, shall be produced to the Register for survey.

1.3.2.7 If satisfied with the results of survey, the Register issues to the manufacturer a Certificate of Approval stating that the container design type concerned complies with technical conditions set out in Section 2 "Technical Requirements" of the present Rules.

The Certificate of Approval shall be issued as a single copy and is valid for all containers manufactured in conformity with technical documentation approved by the Register for the design type concerned.

The Certificate of Approval shall entitle the manufacturer to affix to every container manufactured to the approved design type, the CCC Plate.

1.3.3 Procedure for approval at a stage subsequent to manufacture.

1.3.3.1 If approval of containers for the transport of goods under Customs seal is desired at any stage subsequent to manufacture, the owner of containers shall submit an application in writing to the Register. The application shall state the manufacturer's number placed on each container.

The containers mentioned in the application shall be produced to the Register for survey individually or by batches of the same design type.

1.3.3.2 If satisfied with the results of survey, the Register issues to the owner a Certificate of Approval stating that containers comply with technical conditions set out in Section 2 "Technical Requirements" of the present Rules.

The Certificate of Approval shall be issued as a single copy, and shall entitle the owner to affix to every container, approved according to this procedure, the CCC Plate.

2 TECHNICAL REQUIREMENTS

2.1 GENERAL

2.1.1 Approval for the international transport of goods under Customs seal may be only granted to containers constructed and equipped in such a manner that:

.1 no goods can be removed from, or introduced into, the sealed part of container without leaving visible traces of tampering or without breaking the Customs seal;

.2 Customs seal can be simply and efectively affixed to them;

.3 they contain no concealed spaces where goods may be hidden;

.4 all spaces capable of holding goods are readily accessible for Customs inspection.

2.2 STRUCTURE OF CONTAINERS

2.2.1 The constituent parts of a container (sides, floor, doors, roof, uprights, frames, cross-pieces, etc.) shall be assembled either by means of devices which cannot be removed and replaced from the outside without leaving visible traces or by such methods as will produce a structure which cannot be modified without leaving visible traces.

When the sides, floor, doors and roof are made of various materials, these shall meet the outlined requirements and be of sufficient strength. Where joining devices (rivets, screws, bolts, nuts, etc.) are used, a sufficient number of such devices shall be inserted from outside, traverse the assembled constituent parts, protrude inside and there be firmly secured (e.g. riveted, welded, bushed, bolted, and riveted or welded on the nut). However, conventional rivets (i.e. rivets which placing requires handling from both sides of the assembly) may also be inserted from inside. Notwithstanding the above, container floors may be secured by means of self-tapping screws or self-drilling rivets or rivets inserted by means of an explosive charge or pins inserted pneumatically, when placed from inside and passing at right angles through the floor and metallic cross-pieces underneath, on condition, except in case of self-tapping screws, that their ends be flush with the level of the outside part of the cross-piece or be welded on to it.

The Register shall determine that the joining devices meet the above requirements and shall make sure that the constituent parts so assembled cannot be removed or replaced without leaving visible traces.

Joining devices which can be removed or replaced from one side without leaving visible traces, i.e. without requiring handling from both sides of the constituent parts to be assembled (e.g. expansion rivets, blind rivets and the like), shall not be allowed.

Where, due to technical reasons, it is not practicable to secure the constituent parts in the manner described above, they may be joined by means of devices which placing can be effected only from one side, provided that the joining devices used on the inner face of the wall are not accessible from outside.

2.2.2 Doors and other closing systems, including stopcocks, manhole-covers, flanges, etc. shall be fitted with a device on which Customs seals can be fixed. This device must be such that it cannot be removed and replaced from outside the container without leaving visible traces, or the door or fastening be opened without breaking the Customs seals.

The Customs seals shall be adequately protected.

Containers having a large number of such closures, as valves, stopcocks, manhole covers, flanges etc. shall be so constructed as to reduce the number of Customs seals to a minimum. To this end, neighbouring closures must be joined together by a common device requiring

only one Customs seal, or must be provided with a cover meeting the same purpose.

2.2.3 Containers with opening roofs shall be so constructed as to permit sealing with a minimum number of Customs seals.

2.2.4 Butt-hinges, strap hinges, hinge-pins and other details for hanging doors and the like shall be secured by welding or riveting, by means of bushes, bolts, by riveting or welding on the nuts. Moreover, the various components of such devices (e.g. hinge-plates, pins or swivels) must be so fitted that they cannot be removed or dismantled when the container is closed and sealed without leaving visible traces.

Where a door or closing device has more than two hinges, only those two hinges nearest to the extremities of the door need be fixed in conformity with requirements of this paragraph.

Exceptionally, in the case of thermal containers only, the Customs sealing device, the hinges and any fittings the removal of which would give access to the interior of the container or to spaces in which goods could be concealed, may be fixed to the doors of such containers by means of set bolts or set screws which are inserted from outside but which do not otherwise meet the requirements of 2.2.1, on condition that:

the tails of the set bolts or set screws are fixed to a tapping plate or similar device fitted behind the outer layer (layers) of the door structure;

the heads of an appropriate number of set bolts or set screws are so welded to the Customs sealing device, hinges, etc., that they are completely deformed and that the set bolts or set screws cannot be removed without leaving visible traces (Fig. 2.2.4).

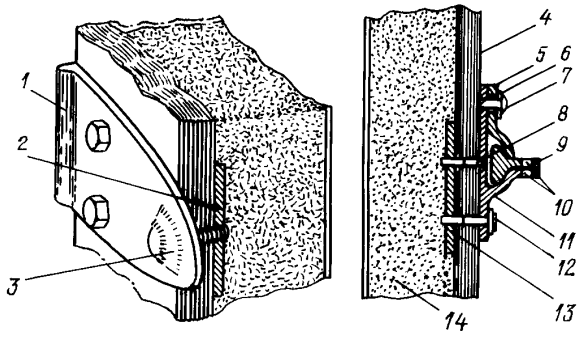


Fig. 2.2.4 Example of hinge (a) and Customs sealing device (b) on doors of thermal containers

1 — hinge blade; *2* — tapped metal plate; *3* — head of set bolt or screw fully welded and completely deformed; *4* — door; *5* — pivoting section; *6* — pivot bush; *7* — pivot; *8* — set screw head completely deformed by welding, not accessible when door sealed; *9* — lever; *10* — holes for Customs seals; *11* — back plate; *12* — head of set bolt or set screw completely deformed by welding; *13* — tapped metal plate; *14* — insulating material

2.2.5 The Customs sealing devices (Figs. 2.2.5-1 and 2.2.5-2) must:

.1 incorporate holes of not less than 11 mm in diameter or slots of at least 11 mm in length and 3 mm in width;

.2 be so designed that, once the container has been closed and sealed, the device cannot be removed without leaving visible traces;

.3 be secured by welding.

The Customs sealing devices shown on Fig.2.2.5-2 may also be fixed to doors of thermal containers. Such devices may be secured by means of at least two set bolts or set screws fixed into a metal tapped plate inserted behind the outer layer of the door. In such cases the heads of set bolts or set screws shall be so welded that they are completely deformed.

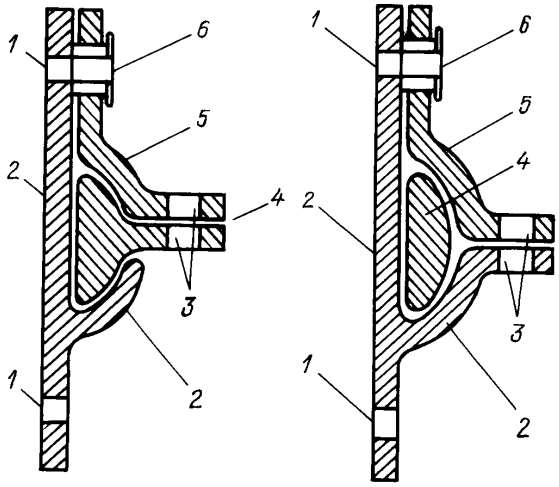


Fig 2.2.5-1 Customs sealing device
1 — hole for rivet, screw, bolt, etc. (to be secured from inside of the door); *2* — back plate; *3* — hole for Customs seal; *4* — lever; *5* — pivot section; *6* — rivet, screw, bolt, etc. affixing pivot section

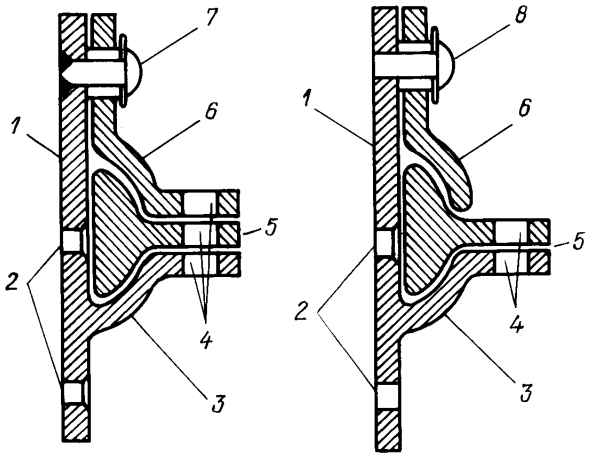


Fig. 2.2.5-2 Customs sealing device
1 — back plate; *2* — hole for rivet, screw, bolt, etc. (to be secured from the inside of the door); *3* — lever retainer; *4* — hole for Customs seal; *5* — lever; *6* — pivoting section; *7* — rivet welded to back plate; *8* — rivet, screw, bolt, etc. affixing pivoting section

2.2.6 Ventilation and drainage apertures shall be provided with a device preventing access to the interior of the container. This device must be such that it cannot be removed or replaced from outside without leaving visible traces. The maximum dimension of vent apertures shall not exceed 400 mm and that of drainage apertures shall not exceed 35 mm.

Ventilation and drainage apertures permitting access to the goods, shall be obstructed by means of wire gauze or perforated metal screen with maximum hole dimension 3 mm in both cases and shall be protected by a welded metal lattice work with maximum hole dimension 10 mm.

The ventilation apertures not permitting direct access to the goods (e.g. because of elbow or baffle-plate systems) shall be provided with devices outlined in the foregoing paragraph, the hole dimensions being, however, as much as 10 and 20 mm respectively.

For the drainage apertures, which do not permit direct access to the goods, the devices, mentioned in the foregoing paragraph, may be omitted, on condition that the apertures are provided with a reliable baffle system readily accessible for inspection from inside of the container.

If vent openings are made in sheets, the above mentioned blocking devices shall be provided. However, blocking devices in the form of a perforated metal screen, fitted outside, and wire or other gauze, fitted inside, are admissible.

Identical non-metal devices may be allowed provided that the holes are of requisite dimensions and the material used is strong enough to prevent the holes from being substantially enlarged without visible damage. In addition, it must be impossible to replace the said devices by working from one side of the sheet only.

2.2.7 Notwithstanding the requirement of 2.1.1.3, constituent part of the container which, for practical reasons, have to included empty spaces (for example, between the partitions of a double wall) shall be permitted. In order that the said spaces cannot be used to conceal goods, the lining inside the container shal be so fitted that it cannot be removed and replaced without leaving obvious traces; or the number of the said spaces shall be kept to a minimum and these spaces shall be readily accessible for customs inspection.

2.3 CONTAINERS CAPABLE OF BEING FOLDED OR DISMANTLED

2.3.1 The containers capable of being folded or dismantled shall comply with requirements stated in 2.1 and 2.2.

In addition, such containers shall be fitted with a bolting system which locks the various parts together once the container has been erected. This bolting system shall be so designed as to enable sealing by Customs seals, if it is fitted on the outside of the container after assembly.

2.4 SHEETED CONTAINERS

2.4.1 Containers fitted with sheets shall comply with requirements stated in 2.1, 2.2 and 2.3 in so far as these requirements are applicable to such containers. The sheets of such containers are to comply with requirements of 2.4.2-2.4.11.

2.4.2 The sheet shall be either of strong canvas or of plastic-covered or rubberized cloth, which shall be of sufficient strength and unstretchable. It shall be in good condition and made up in such a way that once the closing device has been secured, it is impossible to gain access to the load compartment without leaving obvious traces.

2.4.3 If the sheet is made up of several pieces, their edges shall be folded into one another and sewn together with two seams at least 15 mm apart (Fig. 2.4.3-1).

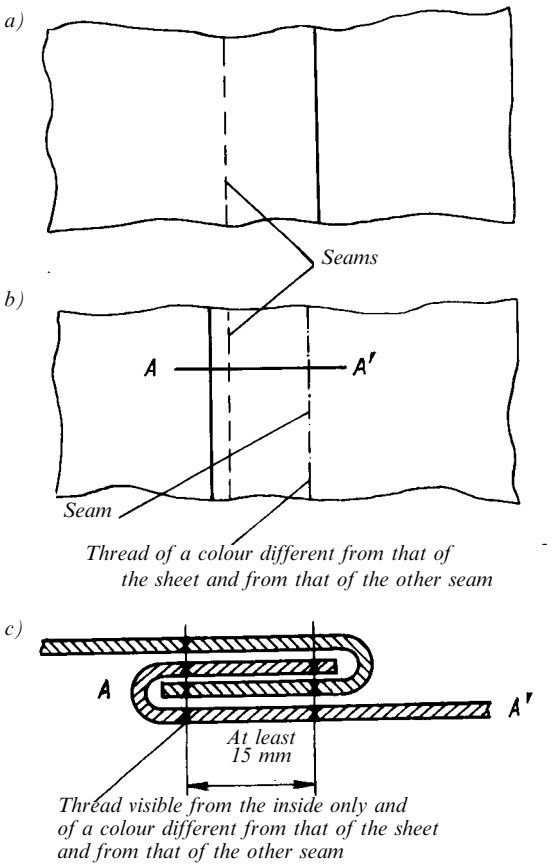


Fig. 2.4.3-1 Sheet made of several pieces of cloth sewn together by means of seams:
a — outside view; *b* — inside view; *c* — section A-A'
Double flat seam

However, if for certain parts of the sheet (such as flaps at the rear or at reinforced corners) it is not possible to assemble the pieces in that way, it will be sufficient to fold the edge of the top portion and make the seams so as shown in Fig. 2.4.3-2 and 2.4.3-3. One of the seams shall be visible only from the inside and the colour of the thread used for that seam shall be clearly different from the colour of the sheet itself and from the colour of the thread used for the other seam. All seams shall be machine-sewn.

The cloth of which pieces of the sheet are made shall meet the requirements of 2.4.2.

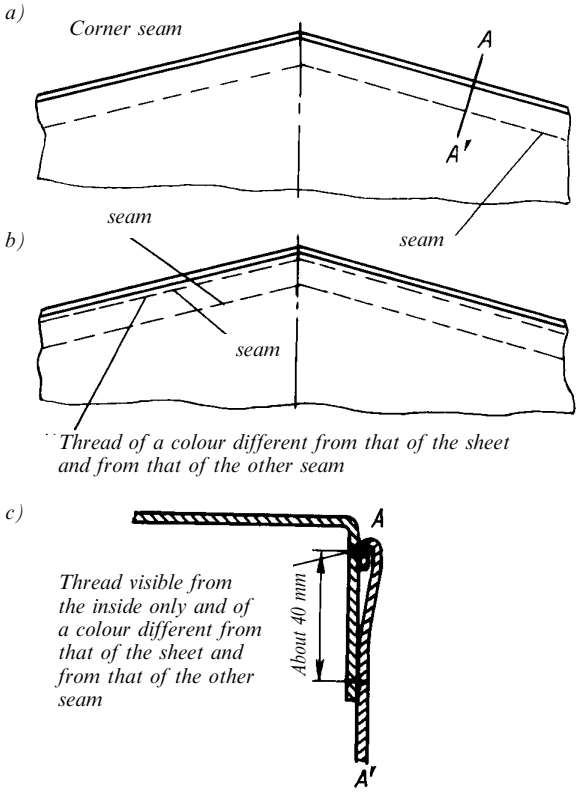


Fig. 2.4.3-2
Sheet made of several pieces of cloth:
a — outside view; *b* — inside view; *c* — section A-A′

2.4.4 If the sheet is made up of several pieces of plastic-covered cloth, the pieces shall be alternatively soldered together (Fig. 2.4.4). The edges of the pieces shall overlap by at least 15 mm. The pieces shall be fused together over the whole width of the overlap. The edge of the outer sheet shall be covered with a band of plastic material of at least 7 mm wide, affixed by the same fusing process. The plastic band and a width of at least 3 mm on each side shall have a well-marked uniform relief stamped on it. The pieces shall be bound in such a way that they cannot be separated and rejoined without leaving visible traces.

2.4.5 Any arrangement of pieces is permitted for making up a sheet, provided the pieces are assembled according to provisions of 2.4.3.

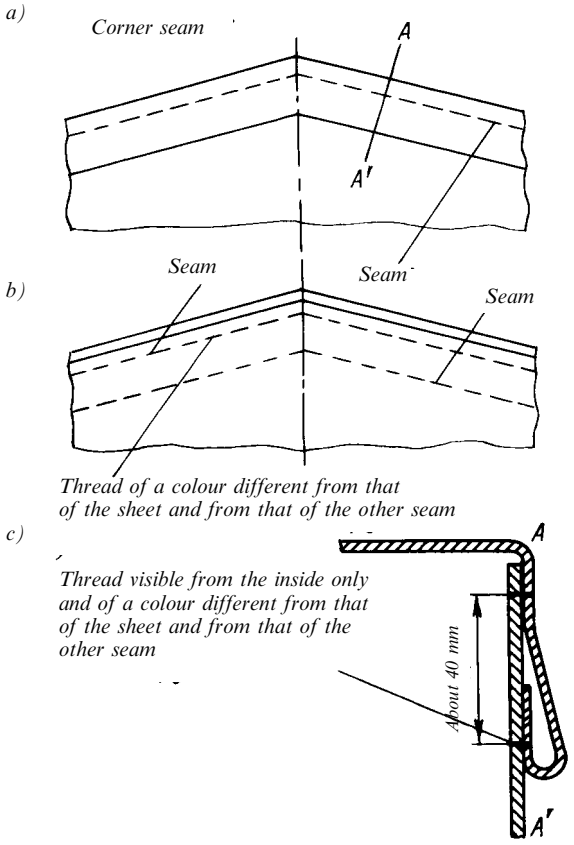


Fig. 2.4.3-3
Sheet made of several pieces of cloth:
a — outside view; *b* — inside view; *c* — section A-A'

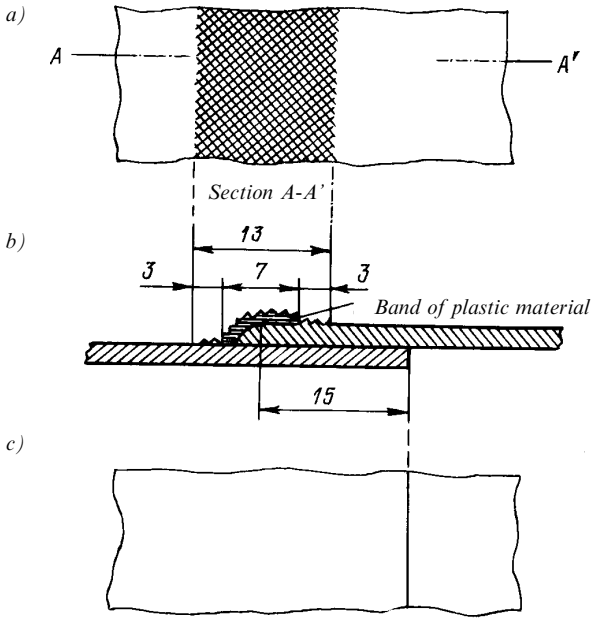


Fig. 2.4.4
Sheet made of several pieces soldered together (dimensions are shown in mm):
a — outside view; *b* — section A-A'; *c* — inside view

2.4.6 The method for repairing the sheet is shown in Fig. 2.4.6. The edges to be sewn shall be folded into one another and sewn together with two clearly visible seams at least 15 mm apart; the colour of the thread visible from the inside shall be different from that of the thread visible from the outside and from the colour of the sheet itself. All seams shall be machine-sewn.

When a sheet which has been damaged near the edges is repaired by replacing the damaged part by a patch, the seam may also be made according to 2.4.3 and 2.4.3-1.

Sheets of plastic-covered cloth may alternatively be repaired by the method described in 2.4.4, but in that case the plastic band shall be affixed to both sides of the sheet, while the patch shall be fitted on the inside of the sheet.

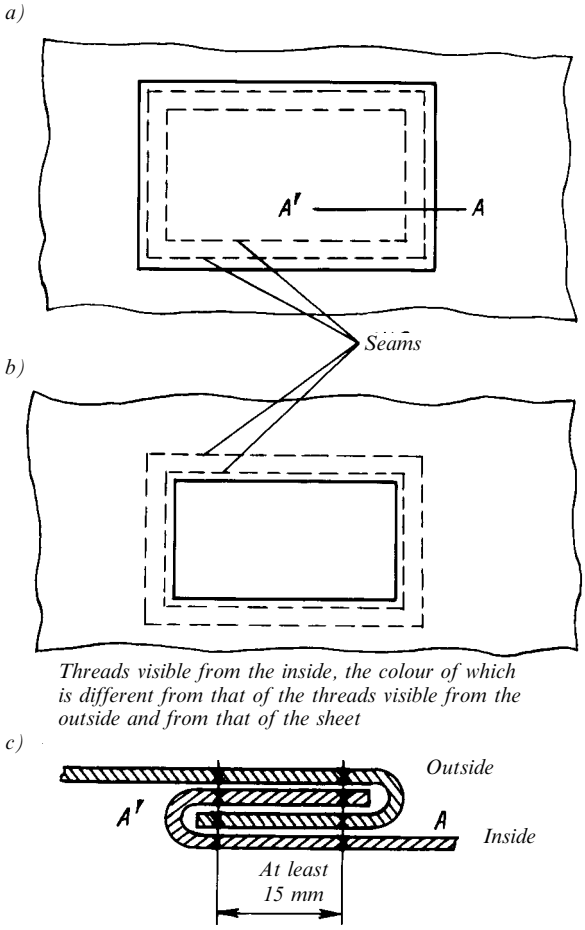


Fig. 2.4.6 Repair of the sheet
a — outside view; *b* — inside view; *c* — section A-A'

2.4.7 The sheet shall be affixed to the container according to provisions set forth in 2.1.1.1 and 2.1.1.2 by one of the following types of fastening:

metal rings fixed to the container;

eyelets let into the edge of the sheet;

a rope or a wire passing through the rings above the sheet and visible from the outside for its entire length.

Where the edges of the sheet are to be permanently attached to the body of the container, the sheet shall be held in place by one or more strips of metal secured to the body of the container by joining devices meeting the requirements of 2.2.4.

Examples of construction systems of affixing container sheet as well as the sheet around the container corners, acceptable from a Customs point of view, are shown in Figs 2.4.7-1 and 2.4.7-2.

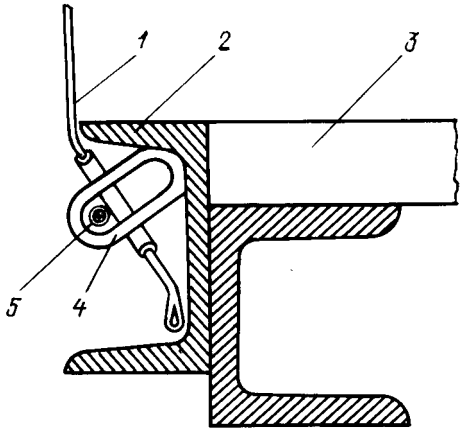


Fig. 2.4.7-1
Device for affixing the container sheet:
1 — sheet; *2* — steel girder; *3* — floor;
4 — securing ring; *5* — sheet-retaining rope

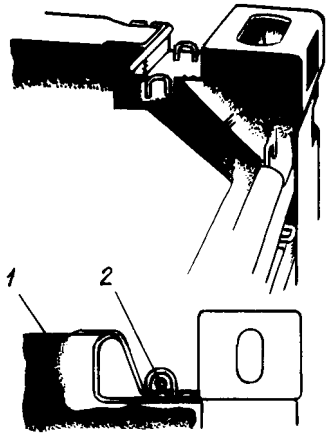


Fig. 2.4.7-2
Device for affixing the sheet around container corners:
1 - sheet on the roof; *2* - sheet-retaining rope

2.4.8 The fastenings of a sheet shall comply with the following requirements:

.1 the spaces between the rings and the spaces between the eyelets shall not exceed 200 mm. The

spaces may, however, be greater but shall not exceed 300 mm between rings and eyelets on either side of the upright if the construction of the container and the sheet is such as to prevent all access to the interior of the container. The eyelets shall be reinforced;

.2 the space between the eyelets of the portion of the sheet overlapping the upright (cross-members of the roof) and the space between the corresponding rings on the container shall not exceed 300 mm, on condition that the rings are recessed in the side boards and the eyelets are oval and so small that they can just pass over the rings;

.3 the steel wire rope shall be at least 3 mm in diameter. The wire rope may be encased in a transparent unstretchable plastic sheath;

.4 a wire rope comprising a textile core surrounded by strands of steel wire shall also be at least 3 mm in diameter (exclusive of the transparent plastic sheath, if any);

.5 the rope shall be of hemp or sisal of at least 8 mm in diameter, encased in a transparent ustretchable plastic sheath;

.6 each cable or rope, whatever the material, shall be in one piece and have metal end-pieces at each end. The fastening arrangement of each metal end-piece shall include a hollow rivet passing through the cable or rope so as to allow the introduction of a thread or strap of the Customs seal. The rope or cable shall remain visible on either side of the hollow rivet so that it is possible to make sure that the rope or cable is in one piece. Fig.2.4.8.6 shows a specimen of the end-piece;

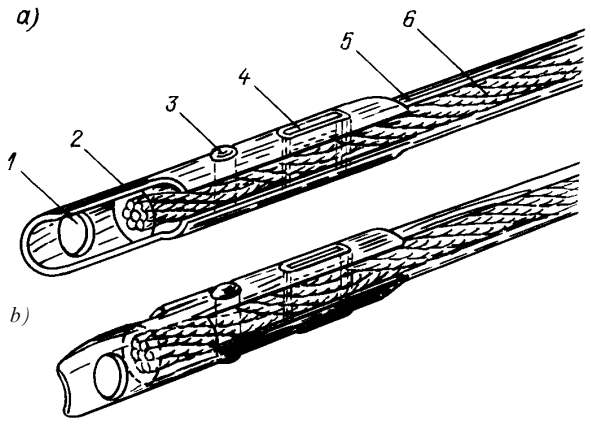


Fig. 2.4.8.6.
Specimen of end-piece (side view):
a — front; *b* — back
1 — hole for closing by carrier; *2* — hard metal end-piece; *3* — solid rivet; *4* — hollow rivet for passing the thread or the strap of the Customs seal (minimum dimensions of the hole: width — 3 mm, length — 11 mm); *5* — transparent plastic sheath; *6* — rope

.7 metal securing rings sliding on metal bars (Fig. 2.4.8.7) are acceptable provided that:

the bars are affixed to the container at maximum spacings of 600 mm in such a manner that they cannot be removed and replaced without leaving obvious traces;

the rings are made with double hoop or equipped with a central bar and made in one piece without the use of welding;

the sheet is fixed to the container in accordance with requirements of 2.1.1.3.

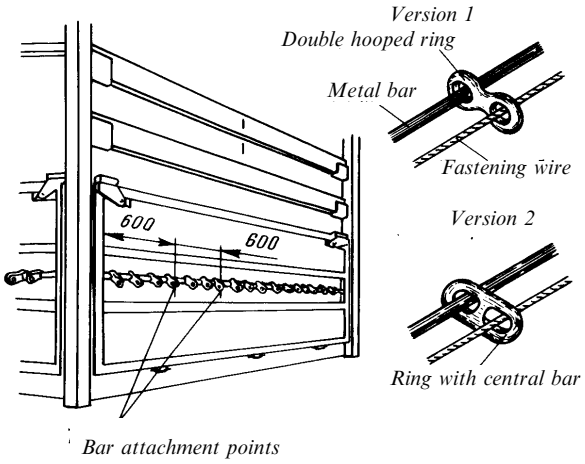


Fig. 2.4.8.7 Sheeted containers with sliding rings

2.4.9 Where the sheet is provided with openings used for loading/unloading, the two edges of the sheet shall adequately overlap and be fastened by:

.1 a flap sewn or soldered in accordance with 2.4.3 or 2.4.4 from the inside of the sheet. A flap may not be required if a special device (e.g. baffle plate, etc.) is fitted which prevents access to the goods. Such device is shown in Fig. 2.4.9.1.

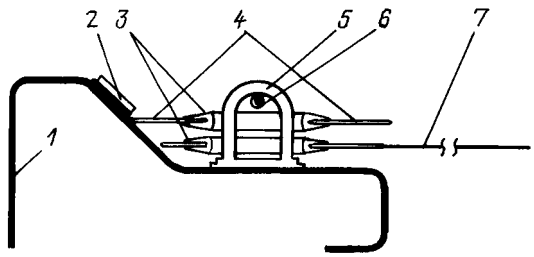


Fig. 2.4.9.1 Device for affixing container sheets:
1 — wall; *2* — metal bar, riveted; *3* — eyelets; *4* — flap; *5* — securing ring; *6* — sheet retaining rope; *7* — sheet

.2 small individual flaps each pierced by one eyelet secured to the outside surface of the sheet and spaced at such distances as will permit an adequate tensioning of the sheet;

.3 rings and eyelets complying with requirements of 2.4.8;

.4 a thong made of appropriate unstretchable material, in one piece, at least 20 mm wide and 3 mm thick, passing through the rings and holding together the two edges of the sheet and the flap. The thong shall be secured inside the sheet and have an eyelet to take the cable or rope mentioned in 2.4.8.

The thongs may be manufactured of leather, unstretchable textile materials, including plastic-covered or rubberized cloth, provided that such materials cannot after severance be welded or reconstituted without leaving visible traces. Furthermore, the plastic material used to cover thongs shall be transparent and smooth-surfaced.

2.4.10 The sheet shall overlap the solid part of the container by at least 250 mm, measured from the centre of securing rings, unless the construction of the container by itself prevents all access to the goods.

2.4.11 In no case shall the sheet conceal the marking of container.

3 MARKING

3.1 THE CCC PLATE

3.1.1 The applicant to whom the Register has issued the Certificate of Approval (see 1.3.2.7 and 1.3.3.2) shall affix to every approved container the CCC Plate.

3.1.2 The CCC Plate is a metal plate of rectangular shape measuring not less than 200×100 mm, and bearing the following particulars in the English language (Fig. 3.1.2):

.1 "approved for transport of goods under Customs seal";

.2 type;

.3 manufacturer's No. of the container.

The height of letters for the title of the CCC Plate (see 3.1.2.1) shall be minimum 8 mm. The height of all other letters and figures shall be not less than 5 mm.

The title and the particulars on the plate shall be stamped into, embossed on, or indicated on its surface in any other permanent and legible way.

The CCC Plate shall be made of durable, non-corrosive and fire-proof material.

3.1.3 The CCC Plate shall be permanently affixed to the container at a clearly visible place where it cannot be easily damaged.

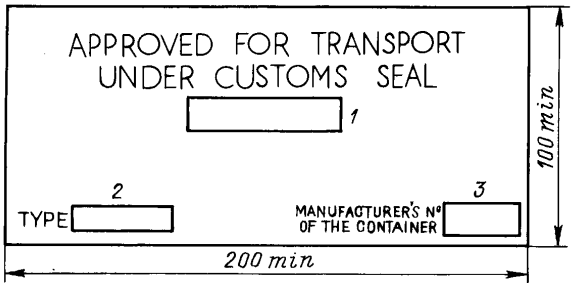


Fig.3.1.2 The CCC Plate

Notes:

1. There shall be indication of the country in which approval was granted either by name in English or by means of the distinguishing sign used to indicate the country of registration of motor vehicles in international road traffic, and the number of the Certificate of Approval and the year of approval.

2. Type means the identification numbers and letters assigned to the design type of container by the manufacturer, and is indicated on the CCC Table only if the container has been approved by design type.

3. There shall be indicated the serial number assigned to the container by the manufacturer.

GUIDELINES ON THE SUPERVISION OF CONTAINERS IN SERVICE

1 GENERAL

1.1 APPLICATION

The present Guidelines apply to the containers granted the CSC Plate.

1.2 DEFINITIONS

For the purpose of these Guidelines the following definition applies:

Surveys are examinations, gauging, tests and checks in operation as well as checking of the prescribed marking and stamping.

2 TECHNICAL SUPERVISION

2.1 GENERAL

2.1.1 The responsibility for submission of containers for surveys within the terms of the present Guidelines and in the stipulated cases, presentation of necessary documents, as well as testing, gauging and inspecting for defects rests with the owner of containers.

The CCC Convention gives the owners of container power to choose survey procedures:

submission of containers for examinations at time intervals given in 3.2 (special survey scheme);

submission of containers for survey in accordance with ACEP program approved by the Register.

2.1.2 The responsibility for maintaining containers in proper condition for safe operation thereof rests with the owner of containers. At time intervals between prescribed surveys the owner shall ensure the necessary checkings and examinations to reveal possible defects and faults, availability of marking of the containers and its compliance with the provisions of the CSC Convention and the requirements of the Rules for the Construction of Containers.

2.1.3 If an approved container has ceased to comply with the provisions of the CSC Convention and the requirements of the above Rules, due to structural or manufacturing defects revealed during service, and such occurence is observed on a considerable number of containers out of the approved series, the Register may cancel the approval.

2.1.4 In the case of loss of a CSC and/or CCC Plate, approval of an individual container for further service is subject to special consideration by the Register in each particular case.

2.1.5 When the approved containers undergo modification all documents relative to such modification shall be submitted to the Register. Based on the results of consideration of the documentation submitted and the results of the prototype container testing to be performed, if considered necessary, the Register may grant a new approval.

The scope of testing shall be established by the Register in each particular case.

3 SURVEYS

3.1 GENERAL

3.1.1 Containers are surveyed on application in writing from owners or lessees (the lessee shall have an appropriate agreement with the owner, which shall establish responsibility of the lessee for satisfaction of requirements set out in 2.1.1 of the present Guidelines).

3.2 PERIODIC EXAMINATION SCHEME

3.2.1 The Register performs the following surveys of containers under the periodical examination scheme:

.1 first special survey, not later than 5 years after the date of manufacture.

Note. The date (month, year), before which a container shall undergo its first special survey is indicated on the CSC Plate affixed to the container after manufacture and may be indicated on both marked panels of the container side walls (when these are not provided, in the bottom portion of both side walls, in way of the owner code and number marking).

.2 subsequent special surveys, at intervals not exceeding 30 months.

Note. The date (months, year), before which a container shall undergo a special survey is indicated on the CSC Plate or on the container itself, near the CSC Plate, and may be indicated on both marked panels of the container side walls (when these are nor provided, in the bottom portion of both side walls, in way of the owner code and number marking).

.3 occasional surveys to be held on application from owners of the containers or other organizations concerned;

.4 first special survey of the tank containers for pressurized liquids, gases and dry solids in bulk, not later than 30 months after the date of manufacture;

.5 special surveys of containers are carried out within three months either way of the date shown on the CSC Plate.

3.2.2 Special surveys of the containers include:

.1 external examination, inclusive of the roof and base, and examination of the internal volume of the empty container. If the container is loaded, the Register may require it to be unloaded to allow the examination of the internal volume;

.2 examination with provisions of access for examination, opening-up or dismantling of machinery (units), thermal insulation etc. at the discretion of the Register Surveyor, depending on technical condition of the container;

.3 tests and checkings at the discretion of the Register, depending on technical condition of the container.

3.2.3 In specific cases, depending on the technical condition of the tank container, the Register may require a diagnostic study of the container to be made by methods approved by the Register.

The tank containers intended for transport of dangerous cargoes, the service period of which exceeds 10 years from the date of manufacture, are subjected to the diagnostic inspections by methods approved by the Register during the special 5-year surveys in the scope prescribed by the RS surveyor as per the results of the examination. Diagnostic inspection comprises the tank thickness measurements, examination of tank welded seams and places of tank attaching to the frame.

3.2.4 The scope of survey of tank containers for pressurized liquids, gases and dry solids in bulk shall comply with the requirements of 3.2.2, 3.2.3 and those of Table 3.2.4.

3.2.5 The scope of special surveys of thermal containers shall comply with the requirements of 3.2.2 and moreover, in accordance with the application from the owner or lessee, survey may be extended for the objects listed in Table 3.2.5.

3.3 APPROVED CONTINUOUS EXAMINATION PROGRAM (ACEP)

3.3.1 The containers are to be surveyed under ACEP in accordance with 2.1.1 by means of:

.1 complete surveys which constitute surveys carried out upon major repair, updating, modification or taking on/off lease;

.2 examinations in service, which are considered as rechekings performed with the aim to defect any damage or wear which can necessitate corrective measures.

3.3.2 Containers, examination of which is to be made under ACEP, shall be subjected to complete

Table 3.2.4

Surveys of tank containers for pressurized liquids, gases and dry solids in bulk

Nos.	Object to be surveyed	Surveys [1]		
		2,5 years after the date of manufacture	Special survey every 5 years	After 2,5 years
1	Tank	OH	OHM	OHM
2	Safety devices	OH	OH	OH
3	Pipes and fittings and cooling and/or heating systems	OH	OPH	OPH
4	Instrumentation	E	E	E
5	Manholes and their closures	OP	OPM	OPM
6	Drain openings and their closures	P	OPM	OPM
7	Framework, including fastenings of tanks	C	OC	OC
8	Devices for producing and maintaining of pressure and temperature	O	P	O

[1] Symbols:

O — examination with provision of access for examination, opening-up or dismantling of machinery (units), thermal insulation, etc.,

C — external examination (inclusive of internal volume of the container),

M — gauging of wear, clearances, insulation resistance of electrical equipment, nondestructive sampling inspection of welds;

H — tests (thermal, hydraulic, air). Hydraulic test is to be performed every 5 years, air test — every 2,5 years. The pressure and the hydraulic pressure test procedure for vessels, as well as the leakproofness test procedure for tank containers shall be in accordance with 3.8 of Part IV "Tank Containers" of the Rules for the Construction of Containers. At 5-year surveys, cooling and/or heating systems shall be subjected to a hydraulic pressure test at 1,5 times the working pressure of the system;

E — checking of availability of the documents and/or stamps of Classification Societies or appropriate competent authorities;

P — testing of machinery (units) in service and external examination thereof.

Table 3.2.5

Surveys of thermal containers

Nos	Object to be surveyed	Survey
I	Insulated container	CH
II	Refrigerated and/or heated container	
1	Refrigerating unit (as a whole)	OP
2	Components of refrigerating unit	
2.1	Compressor	OPH
2.2	Fans	P
2.3	Refrigerant pressure vessels and apparatus	OH
2.4	Safety valves (devices)	OPH
2.5	Refrigerant pipes and fittings	OPH
2.6	Starting and control arrangements of refrigerating unit	P
2.7	Instrumentation	E
2.8	Automatic equipment of refrigerating unit:	
2.8.1	Control devices	P
2.8.2	Protection devices	OP
3	Thermal insulation of container and of closing devices thereof	C
4	Air pipes and air ducts, drainage arrangements	OP
5	Electrical equipment	
5.1	Source of electrical power, if any	OPM
5.2	Distribution gears	OEPM
5.3	Cables	OM
5.4	Plugs	OM
5.5	Electrical drives of fans and compressors	OPM
5.6	Alarms and protective devices	OP
5.7	Heating unit, if any	OPM
6	Drive of electrical power source, if any	OPM
III	Refrigerated container with expendable requirement	
1	Refrigerant pressure vessels	C
2	Fans	P
3	Refrigerant sublimation or evaporation control devices	P
4	Instrumentation	E
5	Thermal insulation of container and of closing devices thereof	C
6	Air pipes and air ducts, drainage arrangements	OP

[1]For symbols see Table 3.2.4

survey in cases specified in 3.3.1.1 but under no circumstances should the examination be made less than once every 30 months.

3.3.3 The ACEP Program to be submitted to the Register Head Office for approval, shall contain, at least, the following information:

.1 number of containers included in the Program;

.2 Approval Nos. according to the CSC Convention for each design type of container;

.3 date of manufacture of container;

.4 date of last survey;

.5 nature and frequency of examinations;

.6 dates of surveys and measures enabling the container to be surveyed not less than once every 30 months;

.7 availability of control system over the survey terms;

.8 owner's assurance that the containers will be surveyed to full extent as outlined in 3.2.2;

.9 names of organizations and works which will carry out maintenance (repair) of containers;

.10 names of organizations, surveying companies which have been assigned by the owner to perform survey of containers;

.11 measures that will be taken by the owner in respect to containers which no longer comply with requirements of the CSC Convention and these Rules.

3.3.4 If satisfied with the results of consideration of the submitted ACEP Program, the Register shall notify the owners and other parties concerned as to approval of the Program.

3.3.5 A sign containing letters with the name of country and the Register's approval number shall be marked on the CSC Plate or in immediate proximity thereof to indicate that the container is operated in conformity with the approved ACEP Program.

3.3.6 The ACEP Program does not cover tank containers.

3.3.7 Works and organizations carrying out maintenance, repair and tests of the containers shall be recognized by the Register.

4 SUPERVISION OF CONTAINERS UNDER REPAIR

4.1 GENERAL

4.1.1 Containers which sustained damages during operation, involving impairment of strength performance of bearing structures shall be repaired under supervision of the Register.

Among these are damages requiring:

replacement of one or more corner fittings;

full or partial replacement of bearing structural elements (corner posts, side rails, cross-members);

full or partial (more than 1/3 area) replacement of side and end panels, as well as roof panels;

full replacement of floor.

4.1.2 In addition to damages listed in 4.1.1, the following damages and malfunctions of the thermal containers shall be repaired under supervision of the Register:

damage of insulation;

damage of cold (heat) generation means;

impairing of weathertightness;

damage of drainage arrangements;

damage of closures;

malfunction of control, protection and monitoring devices;

malfunction of electrical equipment.

4.1.3 In addition to damages listed in 4.1.1 the following damages of tank containers shall be remedied under supervision of the Register:

damage of tank shell and heads;

damage of supports and fastenings;

damage of safety devices;

damage of pipes and fittings;

damage of monitoring devices;

damage of cold (heat) generation means, if any;

damage of thermal insulation, if any.

4.1.4 As criteria for defining possibility of safe operation of the general cargo containers which sustained damages, the Register recommends to use those listed below:

.1 for corner fittings:

dimensions of corner fitting apertures shall not be in excess of ISO tolerances;

corner fitting shall have no cracks, notches and shall not be detached from structural elements of the container;

.2 for corner posts:

depth of a single deformation shall not exceed 25 mm, irrespective of its length and location;

with two or more indentations, none of these shall exceed 15 mm in depth;

cracks, ruptures and punctures shall be repaired regardless of their size;

deformation of corner posts shall not cause the external dimensions of the container to change so as to exceed ISO tolerance by more than 5 mm;

deformation of the rear corner post shall not render the doors inoperable and impair the watertight integrity;

.3 for top and bottom side rails and cross-members:

top side rails and cross-members:

deformations of top side rails and the front rails (dents, bendings, etc.) shall not exceed 25 mm in depth;

deformation of rear top rail shall not exceed 35 mm, render the doors inoperable and impair the watertight integrity;

bottom side rails:

deformations on the webs of side rails shall not exceed 50 mm in depth;

bottom end rails:

deformations on a web shall not exceed 50 mm in depth;

deformation of the rear bottom cross-members shall not render the doors inoperable and impair the watertight integrity;

deformation of the cross-member shall not cause the external dimensions of the container to change so as to exceed ISO tolerance by more than 5 mm;

deformation shall not cause the length of diagonals between the corner fitting apertures to change in excess of ISO tolerance;

cracks, ruptures and punctures shall be repaired, irrespective of their size;

.4 for walls and roof

front and side walls:

no deformation, such as dents, bendings, etc. on a plane portion of the side and front wall where marking is to be applied, or on internal or external corrugations, shall exceed 35 mm;

any two deformations existing on the opposite walls and facing one another shall not cause the distance between walls to decrease by more than 50 mm as against the constructional dimension;

no deformation involving the length or height of a wall shall lead to the reduction of internal dimensions by more than 50 mm;

any deformation of the side walls shall not exceed ISO tolerance by more than 10 mm, any deformation of the front wall shall not exceed ISO tolerance by more than 5 mm;

any deformation which may result in sharp edges liable to cause damage to cargo shall be eliminated;

cracks and punctures, irrespective of their dimensions, shall be repaired;

roof:

deformation shall not exceed 35 mm in depth no deformation involving the length or width of a roof shall lead to the reduction of internal dimensions by more than 50 mm;

punctures, cracks, ruptures shall be repaired, irrespective of their dimensions;

.5 for floor boardings:

cracks, cleavings shall not exceed 15 mm in depth, irrespective of the damage length or shall not exceed 5 mm when the damage width is more than 150 mm;

difference in height between the faces of the adjoining boards shall not exceed 5 mm;

any through holes, spallings of material, splittings shall be repaired;

floor boardings shall be dry, clean and shall not emit specific odour;

.6 for bottom cross-members:

no deformation on a web of cross-members, or on the top plate of fork lift pockets and gooseneck tunnel shall exceed 50 mm;

deformations on a top flange shall not intrude more than 50 mm into the container;

clearance between the top face plate of the cross-member and the floor boardings shall not exceed 10 mm;

in no instance shall the deformations on the bottom flange of cross-members, fork lift pockets and gooseneck tunnel project below the plane 1 mm above the plane of the bottom faces of bottom corner fittings;

any cracks, notches, ruptures shall be repaired;

no deformation of fork lift pockets and gooseneck tunnel shall cause their dimensions to change so as to exceed ISO tolerances by more than 10 mm.

.7 for doors:

no deformation of the door panel shall exceed 35 mm;

no deformation shall render the doors inoperable and shall cause the ISO tolerance for external dimensions to be exceeded by more than 5 mm;

doors shall not have cracks, punctures and other damages which may entail failure of the container watertightness;

.8 for door lock:

broken or notched cams, cam retainers, hinges, hinge bolts, door locking bars shall not be allowed;

bent door locking bars and door locking handles preventing the door from being properly opened or closed, shall be repaired or replaced;

.9 for other damages:

partial or complete lack of marking shall not be allowed.

Note. The Register may approve the use of other international or national regulations and guidelines based on the provisions of the CSC and CCC Conventions and submitted by the owners of containers, repair works or surveying companies.

The criteria for defining safe operation of the general cargo containers and relevant to their framing extend to the framing of the tank containers.

4.1.5 On completion of the repair, containers with the CCC Plates shall comply with requirements of the Rules for the Approval of Containers for the Transport of Goods Under Customs Seal.

4.1.6 Materials used for repairing containers shall have characteristics equivalent to those of the materials used for the manufacture of containers or similar to them. Material, used for repairing vessels of tank containers shall have a document confirming supervision of the Register.

4.2 TECHNICAL DOCUMENTATION

4.2.1 A container shall be repaired in compliance with technical documentation approved by the Register.

4.2.2 The technical documentation submitted for repairs shall contain:

.1 description of repairing procedure;

.2 description of the acting quality system or of documented procedures;

.3 necessary drawings;

.4 the table of welding procedures and welding materials, and in the case of repair of tank containers intended for the transport of pressurized goods, Welding Procedure Approval Test Certificate under Form 7.1.33;

.5 description of weld quality control methods;

4.2.3 The Register may approve technical documentation and repairing procedures for a particular type of containers.

4.3 RECOGNITION OF WORKS PERFORMING MAINTENANCE (REPAIR) OF CONTAINERS

4.3.1 Recognition of repair works.

4.3.1.1 Recognition of repair works means that their capability of performing repair of containers has been recognized by the Register.

4.3.1.2 To receive recognition the repair works shall submit an application to the Register Head Office, made in writing and stating the name of the organization, its address, bank details, designations of containers which may be repaired, list of normative documents for the performance of flaw detection and repair, guarantee of payment for the Register's services and for the traveling expenses, the technical documentation given in 4.2.2, and the following information:

.1 structure of the company including the subsidiaries;

.2 list of experts performing the examination, flaw detection, acceptance of containers and engaged in welding operations, adjusting (if any) and testing (if any), stating their qualification;

.3 the company's experience in container repair;

.4 description of testing equipment (if any);

.5 availability of licenses from state authorities for the performance of the types of work stated in the application, which are required under national laws;

.6 technological capability of the works (list of equipment for performing repairs, availability of facilities for storage and examination of containers, methods of transportation of containers).

4.3.1.3 The repair works shall give the assurance to the Register that they will:

.1 submit to the Register the containers under repair for inspection at various stages of repairing;

.2 agree with the Register any alterations in the technical documentation on repair and in repairing procedures;

.3 fulfifl the Custom requirements to container construction;

.4 keep a record of repaired containers, specifying at least the types and identification numbers of containers, dates of beginning and completion of repairs, names and addresses of owners;

.5 submit certificates and appropriate documents for accessory items and materials used in repairing containers.

4.3.1.4 After consideration of application for approval and technical documentation appended thereto the Register by inspecting the repair works establishes the following:

.1 repair procedure and control methods of repairs;

.2 availability of equipment for performing various repairs;

.3 composition of measuring instruments and testing procedure thereof;

.4 availability and technical condition of testing equipment, if any, and certification procedure thereof;

.5 availability of conditions for storage of containers;

.6 availability of facilities for inspection of all container surfaces;

.7 availability of handling facilities.

4.3.1.5 If satisfied with the results of inspecting the repair works, the Register issues a Certificate of Recognition (form 7.1.4.4) which confirms capability of performing repair of damaged containers. The Certificate of Recognition is valid for 2 years, generally. The validity of the Certificate of Recognition may be extended on application in writing to be forwarded by the repair works to the Head Office of the Register. The Certificate of Recognition shall be used by the Register Head Office or by a Register location duly assigned by the Head Office.

4.3.1.6 Maintenance of the conditions for issuing the Certificate of Recognition is subject to periodical checks by the Register.

4.4 INSPECTIONS AND TESTS

4.4.1 On completion of repair of the general cargo containers the steps to be, at least, performed are:

.1 examination to assure that the repair has been properly made;

.2 examination to assure that the Customs requirements are complied with;

.3 checking of the prescribed dimensions and marking of the container;

.4 weathertightness testings.

Note. In particular cases the Register may require additional tests.

4.4.2 Thermal containers and tank containers, in addition to tests specified in 4.4.1, may be subjected to special tests prescribed for containers concerned, within the scope established by the Register.

5 DOCUMENTS. MARKING AND STAMPING

5.1 DOCUMENTS

Based on the results obtained from survey of a container, the Register, in accordance with the list of documents to be issued, shall draw up a survey report stating technical condition of the container.

5.2 MARKING AND STAMPING

5.2.1 After performing the surveys according to the special survey scheme, the stamp of the Register and date (month, year) of subsequent survey are to be marked on the CSC Plate or as close thereto as possible.

5.2.2 After performing the surveys under ACEP a survey report shall be drawn up and availability of the ACEP label ascertained.

5.2.3 Marking of the container shall comply with the requirements of these Rules.

5.2.4 Containers intended for the transport of dangerous goods as well as the thermal containers, in addition to marking according to 5.2.3, shall bear signs in conformity with the International Maritime Dangerous Goods Code (IMDG Code).

6 KEEPING RECORD OF CONTAINERS IN SERVICE

The Head Office of the Register keeps records of:

Certificates of Approval issued for all types of general cargo containers;

Certificates of Approval, certificates and reports of surveys of tank containers and thermal containers under manufacture and in service;

Certificates of Recognition of works and organizations.

Российский морской регистр судоходства
Общие положения по техническому надзору за контейнерами
Правила изготовления контейнеров
Правила допущения контейнеров к перевозке грузов под таможенными печатями и пломбами
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Russian Maritime Register of Shipping
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