

GUIDE FOR CERTIFICATION OF

CONTAINER SECURING SYSTEMS FEBRUARY 2017

Guide to Color Coding Used in Online Version of the Guide

The following summarizes the colors corresponding to Rule Changes, Corrigenda items and editorial changes in the Guide files which are available for download.

Rule Changes:

Changes effective 1 February 2017

NOTICE NO. 1 – May 2017 (effective 1 May 2017)

NOTICE NO. 2 – December 2017 (effective 15 December 2017)

Corrigenda:

Editorials:

Editorial Changes



GUIDE FOR CERTIFICATION OF

CONTAINER SECURING SYSTEMS

FEBRUARY 2017 (Updated 15 December 2017 – see next page)

**American Bureau of Shipping
Incorporated by Act of Legislature of
the State of New York 1862**

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Updates

December 2017 consolidation includes:

- May 2017 version plus Notice No. 2

May 2017 consolidation includes:

- February 2017 version plus Notice No. 1

Foreword (1 February 2017)

The *Guide for Certification of Container Securing Systems* was first published by ABS with input and advice from industry. When requested by the Owner, ABS will issue certificates for container securing systems which have been constructed and installed according to the requirements of this Guide. However, such a certification is not a classification requirement.

Existing container securing systems which have not been constructed and installed to the requirements of the Guide will, at the request of the Owner, be subjected to a condition survey and plan review for compliance or equivalence with the Guide.

During the years of 2012 ~ 2014, this Guide had gone through a series of revisions and updates reflecting the development in container securing systems.

To meet the industry's demand and service challenge, ABS introduced new requirements and procedures in the July 2016 revision. They are summarized in the following table:

Section	Description of Change
8/3.1, 8/7.7, 8/Table 1	Prototype testing procedures for certifying fully automatic twistlocks are described in these sections.
9/3.9.1 (1 st Para.) & 9/3.9.4	The GM range indicated in 9/3.9.4 is also applicable to container securing manual, not only computer lashing program. As such, the GM range in 9/3.9.4 is moved to 9/3.9.1.
9/3.9.1 (2 nd Para. & table)	It is clarified that for operation in specific voyage trade routes, a minimum of three bays (one from forward bay, one from midship bay and one from aft bay) are sufficient.
Appendix 4	It is clarified that for unrestricted services, the least necessary test cases to be submitted for ABS review are specified.
Appendix 5	The newly developed Appendix 5 offers detailed prototype function test procedure for fully automatic twistlocks. The previous existing Appendix 5 is renumbered to Appendix 6.

The February 2017 revision incorporates the following changes:

Section	Description of Change
2/1	Introduces the fully nonlinear software program "ABS Eagle C-Lash"
2/5.3	Removes definitions of symbols that are not used in the new Subsection 6/5.
3/Table 3, 3/Figure 1	Revises side wall racking force limits and horizontal lashing force on top and bottom corner fittings to be consistent with the limits applied in other similar container securing criteria.
4/Table 2	Revises equivalent elastic modulus of short steel rod lashing assembly (not greater than 5000 mm) for consistency with the limits applied in similar container securing criteria.
5/5.3, 5/Figure 5, 5/Figure 6	Clarifies and states ABS requirements for raised lashing platforms on the basis of the established engineering practices.
6/3.3.1, 6/3.13.4	Clarifies that wind load is applied at maximum roll angle to be consistent with acceleration and that the transverse acceleration and wind forces have same direction only when the minimum vertical acceleration is applied in condition A.
6/3.5.2, 6/3.7	Simplifies the formula for SI and US units.

6/5, 6/Figure 4, 6/Table 1, 6/Figure 5	Considers the twistlock clearance, container rigid body movement and lashing bridge fetch or stiffness.
A4/3	Specifies that onshore calculations are acceptable.

The requirements are based on SI units, and the values shown in U.S. (foot-pound-second) units are derived by numerical conversion.

This Guide does not apply to containers on chassis or trailers stowed aboard vessels.

This Guide becomes effective on the first day of the month of publication.

Users are advised to check periodically on the ABS website www.eagle.org to verify that this version of this Guide is the most current.

We welcome your feedback. Comments or suggestions can be sent electronically by email to rsd@eagle.org.



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SECTION 1 Scope and Conditions of Certification

1 Certification

1.1 Process

The term certification, as used herein, indicates that the initial installation of container securing systems aboard vessels have been designed, constructed, installed, and surveyed in compliance with this Guide, existing Rules and Guides or other acceptable standards.

The certification process consists of:

- a) The development of Rules, Guides, standards, and other criteria for the design, construction, and initial installation of container securing systems;
- b) The review of the design and survey during initial installation to verify compliance with such Rules, Guides, standards, or other criteria;
- c) The assignment and registration of certification when such compliance has been verified.

The Rules, Guides, and standards are developed by the ABS staff and passed upon by committees made up of naval architects, ocean and marine engineers, shipbuilders, engine builders, steel makers, process engineers and by other technical, operating and scientific personnel associated with the worldwide maritime and container industry. Theoretical research and development, established engineering disciplines, as well as satisfactory service experience are utilized in their development and promulgation. ABS and its committees can act only upon such theoretical and practical considerations in developing Rules and standards.

For certification, the container securing systems are to comply with the applicable requirements of this Guide and all applicable Rules.

1.3 Certificates and Reports

Review of design documentation and surveys during construction are conducted by ABS to verify to itself and its committees that an item of material or equipment is in compliance with this Guide and is to the satisfaction of the attending Surveyor. All reports and certificates are issued solely for the use of ABS, its committees, its clients, and other authorized entities.

An approved copy of the container securing manual, copies of the prototype and production test reports for the securing gear, and a copy of the Initial Installation Survey Certificate are to be carried aboard the vessel for use by the vessel's personnel.

1.5 Representations as to Certification

Certification is a representation by ABS as to the structural and mechanical fitness for a particular use or service, in accordance with its Rules, Guides, and standards. The Rules and Guides of the American Bureau of Shipping are not meant as a substitute for the independent judgment of professional designers, naval architects, marine engineers, Owners, operators, masters and crew, nor as a substitute for the quality control procedures of ship and platform builders, engine builders, steel makers, suppliers, manufacturers and sellers of marine vessels, materials, system components, machinery or equipment. ABS, being a technical society, can only act through Surveyors or others who are believed by it to be skilled and competent.

ABS represents solely to the Container Securing Systems manufacturer or other clients of ABS that when certifying, it will use due diligence in the development of Rules, Guides, and standards, and in using normally applied testing standards, procedures and techniques as called for by the Rules, Guides, standards or other criteria of ABS. ABS further represents to the Owner or other clients of ABS that its certificates and reports evidence compliance only with one or more of the Rules, Guides, standards, or other criteria of ABS, in accordance with the terms of such certificate or report. Under no circumstances whatsoever are these representations to be deemed to relate to any third party.

The user of this document is responsible for ensuring compliance with all applicable laws, regulations, and other governmental directives and orders related to a vessel, its machinery and equipment, or their operation. Nothing contained in any Rule, Guide, standard, certificate, or report issued by ABS shall be deemed to relieve any other entity of its duty or responsibility to comply with all applicable laws, including those related to the environment.

1.7 Scope of Certification

Nothing contained in any certificate or report is to be deemed to relieve any designer, builder, Owner, manufacturer, seller, supplier, repairer, operator, other entity or person of any duty to inspect or any other duty or warranty expressed or implied. Any certificate or report evidences compliance only with one or more of the Rules, Guides, standards, or other criteria of the American Bureau of Shipping, and is issued solely for the use of ABS, its Committees, its clients or other authorized entities. Nothing contained in any certificate, report, plan or document review or approval is to be deemed to be in any way a representation or statement beyond those contained in 1/1.5. ABS is not an insurer or guarantor of the integrity or safety of a vessel or of any of its equipment or machinery. The validity, applicability and interpretation of any certificate, report, plan or document review or approval are governed by the Rules, Guides and standards of the American Bureau of Shipping, who shall remain the sole judge thereof. ABS is not responsible for the consequences arising from the use by other parties of the Rules, Guides, standards, or other criteria of the American Bureau of Shipping, without review, plan approval and survey by ABS.

The term “approved” is to be interpreted to mean that the plans, reports or documents have been reviewed for compliance with one or more of the Rules, Guides, standards, or other criteria acceptable to ABS.

This Guide is published with the understanding that responsibility for reasonable container handling and securing operations, beyond the limit specified in the design basis of the container securing systems, does not rest upon the Committee.

3 Suspension and Termination of Certification

3.1 Suspension of Certification

Certification will be suspended and the Container Securing Certificate will become invalid from the date of any use, operation or other application of any container securing system for which it has not been approved and which affects or may affect certification or the structural integrity, quality, or fitness for a particular use or service.

Certification will be suspended and the Container Securing Certificate will become invalid if recommendations issued by the Surveyor are not carried out by their due dates and no extension has been granted.

3.3 Lifting of Suspension

Certification will be reinstated upon satisfactory completion of the rectification surveys. Such surveys will be credited as of the original due date. Certification will be reinstated after suspension for overdue recommendations upon satisfactory completion of the overdue recommendations.

3.5 Termination of Certification

ABS reserves the right to reconsider, withhold, suspend, or terminate the certificate of any container securing system for non-compliance with the Guide and Rules, for defects reported by the Surveyors which have not been rectified in accordance with their recommendations or for nonpayment of fees which are due on account of Container Securing System Surveys. Suspension or termination of certification may take effect immediately or after a specified period of time.

3.7 Notice of Surveys

It is the responsibility of the Owner to ensure that all surveys necessary for the certification are carried out at the proper time.

5 Rules for Certification

5.1 Scope

This Guide contains provisions for the certification of container securing systems installed aboard vessels classed by ABS including but not limited to:

- Below deck cell guide systems
- Below deck bridge strut and shoring systems
- Below deck lashing and lock fitting systems
- Above deck lashing and lock fitting systems
- Above deck buttress and deck cell guide systems

5.3 Alternatives

The Committee is at all times ready to consider alternative arrangements and designs which can be shown, through either satisfactory service experience or a systematic analysis based on sound engineering principles, to meet the overall safety, serviceability and strength standards of the applicable Rules and Guides.

The Committee will consider special arrangements or design for details of container securing systems which can be shown to comply with standards recognized in the country in which the container securing system are designed or built, provided these are not less effective than the requirements contained in this Guide.

5.5 Effective Date of Change of Requirement

5.5.1 Effective Date (1 May 2017)

This Guide and subsequent changes to this Guide are to become effective on the date specified by ABS.

5.5.2 Implementation of Rule Changes

In general, until the effective date, plan approval for designs will follow prior practice, unless review under the latest Guide is specifically requested by the party signatory to the application for certification. If one or more systems are to be constructed from plans previously approved, no retroactive application of the subsequent requirement changes will be required, except as may be necessary or appropriate for all contemplated construction.

5.7 ABS Type Approval Program

5.7.1 Type Approval

Products that are used as components for cargo container securing systems and can be consistently manufactured to the same design and specification may be Type Approved under the ABS Type Approval Program. The ABS Type Approval Program is a voluntary option for the demonstration of compliance of a product with the Rules or other recognized standards. It may be applied at the request of the designer or manufacturer. The ABS Type Approval Program generally covers Product Type Approval (1/5.7.3), but is also applicable for a more expeditious procedure towards Unit-Certification, as specified in 1/5.7.2.

The detail certification requirements for container securing devices are specified in Section 1, Table 1. The detail requirements for type approval of container securing systems are specified in Subsection 8/7 of this Guide.

TABLE 1
Certification Details – Container Securing Devices

Container Securing Devices	Individual Unit Certification ⁽¹⁾	Type Approval Program ⁽²⁾			
		Product Design Assessment ⁽³⁾		Manufacturing Assessment ⁽⁴⁾	
		Design Review	Type Exam	Audit	PQA ⁽⁵⁾
1. Base sockets	d, m, s, t,	d, t	o	o	o
2. Bridge fittings	d, m, s, t	d, t	o	o	o
3. Container corner fittings	g	⁽⁶⁾	o	o	o
4. Fast acting twistlocks	d, m, s, t	d, t	o	o	NA
5. Lashings	d, m, s, t	d, t	o	o	o
6. Stacking cones	d, t	d, t	o	o	o

Notes

- 1 Notations used in this column are:
d – design review by ABS.
m – material tests witnessed by Surveyor.
s – survey at the plant of manufacture including witnessing acceptance tests on production unit.
t – type/prototype testing conducted on an actual sample or a prototype model is required, as applicable.
g – certification by ABS not required; acceptance based on manufacturer's guarantee.
- 2 For description of Type Approval Program, see 1-1-A3/5 of the *ABS Rules for Conditions of Classification (Part 1)*.
- 3 For description of Product Design Assessment, see 1-1-A3/5.1 of the *ABS Rules for Conditions of Classification (Part 1)*.
- 4 For description of Manufacturing Assessment, see 1-1-A3/5.3 of the *ABS Rules for Conditions of Classification (Part 1)*. Notations used in these columns are:
o – indicates the particular element of the program is optional
NA – indicates the particular element of the program is not applicable.
- 5 For description of Product Quality Assurance Certification (PQA), see 1-1-A3/5.5 of the *ABS Rules for Conditions of Classification (Part 1)*.
- 6 Original equipment manufacturer (OEM) is to define the standard to be used in the evaluation.

5.7.2 Unit-Certification

Unit-Certification is a review of individual materials, components, products, and systems for compliance with ABS Rules, Guides or other recognized standards. This allows these items to be placed on a vessel, marine structure or system to become eligible for classification. Certification is a “one-time” review. The process is:

- i) A technical evaluation of drawings or prototype tests of a material, component, product or system for compliance with the ABS Rules, Guides, or other recognized standards.
- ii) A survey during manufacture for compliance with the ABS Rules, Guides, or other recognized standards and results of the technical evaluation.
- iii) Alternatively, a certificate of type approval (see below) will expedite the requirements of i) and ii) above.
- iv) Products found in compliance are issued “Individual Unit Certification”.
- v) There is no requirement for subsequent reviews or surveys.

5.7.3 Product Type Approval

Product Type Approval is a voluntary program used to prove eligibility for certification by demonstrating a product manufacturer's conformance to a specific standard or specification. Manufacturers who can demonstrate the ability to produce consistent products in compliance with these standards are issued "Confirmations of Type Approval" (see 1-1-A3/5.3.4 of the *ABS Rules for Conditions of Classification (Part 1)*). The Confirmation of Type Approval is neither an alternative to nor an equivalent of an Individual Unit Certificate. In order to remain valid, the Confirmation of Type Approval requires routine audits of the manufacturer and continued compliance of the product with existing or new specifications.

5.7.4 Approval on Behalf of Administrations

ABS has also been authorized and/or notified to type approve certain equipment on behalf of Administrations. The list of authorizations and notifications are maintained at each ABS Technical Office.

5.7.5 Applicable Uses of Type Approved Products

- i) When a product is at a stage suitable for testing and/or for use in a classed vessel, and unit certification is required, the manufacturer is to present the product to an attending Surveyor for witnessing of all required Rule testing. Unless specified in the Design Assessment, technical evaluation would not normally be required.
- ii) When a product is at a stage suitable for use in a classed vessel, and unit certification is not required, the product may be installed, to the satisfaction of the attending Surveyor, without the need for technical evaluation.

5.7.6 Definitions

Audit. A systematic and independent examination to determine whether quality activities and related results comply with planned arrangements and whether these arrangements are implemented effectively and are suitable to achieve the stated objectives.

General Audit. An audit that addresses the general operation of a site, and addresses applicable sections of the Quality and Environmental System Manual, quality and environmental system procedures, and operating procedures and process instructions.

Surveillance Audit. An audit that addresses specific areas within the operation at a site, and addresses selected sections of the Quality and Environmental System Manual, quality and environmental system procedures, and operating procedures and process instructions.

Audit Checklist. A listing of specific items within a given area that are to be audited.

Audit Report/Checklist. A combination of audit report and associated checklist.

Component. Parts/members of a product or system formed from material.

Finding. A statement of fact supported by objective evidence about a process whose performance characteristics meet the definition of non-conformance or observation.

Manufacturing Process. The process is the steps that one takes to produce (manufacture) a product.

Manufacturing System. The system is bigger than the manufacturing process, since it considers all of the factors that affect the process. This includes control of the process inputs, process controlling factors (such as competency of personnel, procedures, facilities and equipment, training, etc.) process outputs and measurements of quality, process and product for continual improvement, etc.

Material. Goods used that will require further forming or manufacturing before becoming a new component or product.

Non-conformance. Non-fulfillment of a specified requirement.

Observation. A detected weakness that, if not corrected, may result in the degradation of product or service quality or potential negative impact on the environment.

Original Equipment Manufacturer (OEM). The OEM is the person or legal entity that has the legal or patent rights to produce the material, component, product or system.

Product. Result of the manufacturing process.

Production Testing. This is the destructive and nondestructive examination of the materials and components used in the manufacture of a product and its final testing that is recorded in Unit Certification. The waiving of witnessed testing during production testing may only be allowed as defined in 1-1-A3/3 “Limitations” and 1-1-A3/5.5 “Product Quality Assurance Certification” of the *ABS Rules for Conditions of Classification (Part 1)*.

Prototype Testing. This is the destructive and nondestructive testing of the materials and components presented for evaluation of the original design of a product. If a Surveyor’s witness is required, this may not be waived under any section of the Rules, unless it is done by a recognized third party.

Recognized Third Party. Is a member of the International Association of Classification Societies, a Flag Administration, Nationally Certified testing Laboratories or others who may be presented to ABS for special consideration.

Type Testing. This is the destructive and nondestructive testing of the materials and components of the first article of a product manufactured. If a Surveyor’s witness is required, this may not be waived under any section of the Rules.

5.7.7 The Terms and Conditions for Use of ABS Type Approved Product Logo

When a product is eligible for a Confirmation of Type Approval [1-1-A3/5.3.4 of the *ABS Rules for Conditions of Classification (Part 1)*], the Type Approved Product Logo may also be used with the understanding that it is copyrighted and its use must be controlled as follows:

- i) Any advertisement or other use of the logo is to be presented to the Manager of ABS Programs for review prior to use
- ii) The logo may only be used on correspondence, advertising and promotional material and must not be used except in connection with those goods or services described in the scope and conditions of the Product Design Assessment Certificate.
- iii) The logo may be used only on those materials (i.e., Internet site, letterhead, marketing literature, advertising, invoice stock forms, packaging, etc.) relating to the particular facility and process/ product lines included within the Product Type Approval Certificate.
- iv) The logo may not, under any circumstances, be used directly on or closely associated with products in such a way as to imply that the products themselves are “Unit-certified” by ABS.
- v) If used with other logos, ABS may ask that the manufacturer discontinue any use of other logos that are unacceptable to ABS and any form of statement that, in the opinion of ABS, might be misleading.
- vi) Upon the termination of certification, for whatever reason, the manufacturer must undertake to immediately discontinue all use of the logo and to destroy all stocks of material on which they appear.
- vii) When advertising the product as ABS Type Approved, the manufacturer’s name, if different from the parent company, is to be used in conjunction with this logo. Any use should be specific to the process/product line covered and not represented as a blanket approval of the company.
- viii) The logo may be scaled uniformly to any size necessary. The color of the logo shall be either black or blue (reflex blue or PMS 294 blue).
- ix) Logos are available by e-mail from type_approval@eagle.org.

See the ABS Type Approved Product Logo, as follows:



See the *ABS Type Approval Program* in Appendix 1-1-A3 of the *Rules for Building and Classing Steel Vessels*. The *ABS Type Approval Program* and the indicated references are available for download from the ABS website at: <http://www.eagle.org>.

7 Other Regulations

7.1 International and Other Regulations

While this Guide covers the requirements for the certification of container securing systems, the attention of Owners, designers and builders is directed to the regulations of international, governmental and other authorities dealing with those requirements in addition to or over and above the classification requirements.

Where authorized by the Administration of a country signatory thereto and upon request of the Owners of a certified container securing system or one intended to be certified, ABS will survey for compliance with the provision of International and Governmental Conventions and Codes, as applicable.

7.3 Governmental Regulations

Where authorized by a government agency and upon request of the Owners of a new or existing container securing system, ABS will survey and certify a container securing system or one intended to be certified for compliance with particular regulations of that government on their behalf.

7.5 Other Rules

Where the vessel on which the container securing systems are installed is built in accordance with 1-1-4/7.5 of the *ABS Rules for Conditions of Classification (Part 1)*, ABS will consider the container securing systems constructed to the satisfaction of the Surveyors of ABS in accordance with the plans that have been approved to the Rules/Guides of another recognized classification society with verification of compliance by ABS.

9 Submission of Plans

A list of components and systems that are required for the certification of container securing systems is provided in Subsection 2/3. In most cases, manufacturer's component and system related drawings, calculations and documentation are required to be submitted to substantiate the design of the system or component. In these cases, upon satisfactory completion of ABS review of the manufacturer's submittal, ABS Engineers will issue a review letter. This letter, in conjunction with the submitted package, will be used and referenced during surveys and subsequently issued reports by attending ABS Surveyors.

Upon satisfactory completion of all of the required engineering and survey processes, ABS will issue the Certificate for the container securing system.

11 Notification and Availability for Survey

The Surveyors are to have access to container securing systems at all reasonable times during initial installation.

The Surveyors are to undertake all surveys on container securing systems upon request, with adequate notification, of the Owners or their representatives, and are to report thereon to the Committee. Should the Surveyors find occasion during any survey to recommend further examination, notification is to be given immediately to the Owners or their representatives so that appropriate action may be taken.

13 Units

This Guide is written in two systems of units: SI units and US customary units. Each system is to be used independently of any other system. Unless indicated otherwise, the format of presentation of the two systems of units in this Guide is as follows:

SI units (US customary units)

15 Fees

Fees in accordance with normal ABS practice will be charged for all services rendered by ABS. Expenses incurred by ABS in connection with these services will be charged in addition to the fees. Fees and expenses will be billed to the party requesting that particular service.

17 Disagreement

17.1 Rules and Guides

Any disagreement regarding either the proper interpretation of Rules and Guides or the translation of Rules and Guides from the English language edition is to be referred to ABS for resolution.

17.3 Surveyor

In case of disagreement between the Owners or builders and the Surveyors regarding the material, workmanship, application of the Rules and Guides relating to any system classed or proposed to be classed by ABS, an appeal may be made in writing to the Committee, who will order a special survey to be held. Should the opinion of the Surveyor be confirmed, expense of this special survey is to be paid by the party appealing.

19 Limitation of Liability

The combined liability of the American Bureau of Shipping, its committees, officers, employees, agents or subcontractors for any loss, claim or damage arising from its negligent performance or nonperformance of any of its services or from breach of any implied or express warranty of workmanlike performance in connection with those services, or from any other reason, to any person, corporation, partnership, business entity, sovereign, country or nation, will be limited to the greater of a) \$100,000 or b) an amount equal to ten times the sum actually paid for the services alleged to be deficient.

The limitation of liability may be increased, up to an amount twenty-five times the sum paid for services, upon receipt of client's written request at or before the time of performance of services, and upon payment by client of an additional fee of \$10.00 for every \$1,000.00 increase in the limitation.

Under no circumstances shall American Bureau of Shipping be liable for indirect or consequential loss or damage (including, but without limitation, loss of profit, loss of contract, or loss of use) suffered by any person as a result of any failure by ABS in the performance of its obligations under these Rules. Under no circumstances whatsoever shall any individual who may have personally caused the loss, damage or expense be held personally liable.

21 Hold Harmless

The party requesting services hereunder, or his assignee or successor in interest, agrees to release ABS and to indemnify and hold harmless ABS from and against any and all claims, demands, lawsuits or actions for damages, including legal fees, to persons and/or property, tangible, intangible or otherwise which may be brought against ABS incidental to, arising out of or in connection with this Agreement, the work to be done, services to be performed or material to be furnished hereunder, except for those claims caused solely and completely by the negligence of ABS, its agents, employees, officers, directors or subcontractors. The parties agree that for the purposes of the Convention on Limitation of Liability for Maritime Claims, 1976, ABS is a person for whose acts the shipowner is responsible.

Any other individual, corporation, partnership or other entity who is a party hereto or who in any way participates in, is engaged in connection with or is a beneficiary of, any portion of the services described herein shall also release ABS and shall indemnify and hold ABS harmless from and against all claims, demands, lawsuits or actions for damages, including legal fees, to persons and/or property, tangible, intangible or otherwise, which may be brought against ABS by any person or entity as a result of the services performed pursuant to this Agreement, except for those claims caused solely and completely by the negligence of ABS, its agents, employees, officers, directors or subcontractors.

23 Time Bar to Legal Action

Any statutes of limitation notwithstanding, Owner's right to bring or to assert against ABS any and all claims, demands or proceedings whether in arbitration or otherwise shall be waived unless (a) notice is received by ABS within ninety (90) days after Owner had notice of or should reasonably have been expected to have had notice of the basis for such claims; and (b) arbitration or legal proceedings, if any, based on such claims or demands of whatever nature are commenced within one (1) year of the date of such notice to ABS.

25 Arbitration

Any and all differences and disputes of whatsoever nature arising out of services under these Rules shall be put to arbitration in the City of New York pursuant to the laws relating to arbitration there in force, before a board of three persons, consisting of one arbitrator to be appointed by ABS, one by the client, and one by the two so chosen. The decision of any two of the three on any point or points shall be final. Until such time as the arbitrators finally close the hearings either party shall have the right by written notice served on the arbitrators and on an officer of the other party to specify further disputes or differences under these Rules for hearing and determination. The arbitration is to be conducted in accordance with the rules of the Society of Maritime Arbitrators, Inc. in the English language. The governing law shall be the law of the State of New York, U.S.A. The arbitrators may grant any relief other than punitive damages which they, or a majority of them, deem within the scope of the agreement of the parties, including, but not limited to, specific performance. Awards made in pursuance to this clause may include costs including a reasonable allowance for attorney's fees and judgment may be entered upon any award made hereunder in any court having jurisdiction.



SECTION 2 General

1 Scope (1 February 2017)

This Guide sets forth requirements for the certification of the initial installation of container securing systems and lashing calculation computer software aboard vessels classed by ABS. It is to be clearly understood that no representation is made as to the ability of any onboard container to withstand the loads allowed. The allowable loads have been derived from successful usage over a number of years and may exceed the design loads set forth in International Organization for Standardization (ISO) Standard 1496-1:1990, American National Standards Institute (ANSI) Standard MH 5.1.1M, the *ABS Rules for Certification of Cargo Containers*, and similar standards. It is the responsibility of the client, shipowner, or charterer to ascertain that the containers used in the system can withstand the loads applied to them.

It is also to be understood that no representation is made as to the absolute validity of the values for dynamic forces from roll, pitch, and heave, vessel vertical center of gravity, container spring constants, and lashing spring constants contained in this Guide. It is the responsibility of the client, shipowner, or charterer to establish the validity of the values for the above items used in the system.

The nonlinear nature associated with the container stacks and lashings requires a large amount of effort to determine the system forces. For this reason, a fully nonlinear software program “ABS Eagle C-Lash” has been developed and is available to clients. Interested parties are kindly requested to contact the nearest ABS plan approval office for more information.

A vessel classed by ABS having an installed container securing system certified by ABS may be distinguished by the additional notation **CSC** in the *Record* for unrestricted service.

A computer lashing program to calculate forces acting on the container securing arrangements and maximum permissible stack weights for unrestricted service may be installed onboard a vessel, see 9/3.9.4. An onboard computer lashing program installed on a vessel assigned the **CSC** notation shall be certified in accordance with Appendix 3 of this Guide and the vessel assigned the notation **CLP** for computer lashing program.

A vessel having an installed container securing system certified by ABS for operation in specific voyage trade routes where reduced accelerations are used in the calculation of forces acting on the container securing system, see 6/3.7.3, shall have an onboard certified computer lashing program, which is mandatory. Such operation may have a different maximum number and arrangement of containers than the unrestricted voyage trade. The suffix **V** shall be added to the computer lashing program notation, **CLP-V**, to signify the certification of the computer lashing program’s capability to address both unrestricted service and specific voyage routes.

Typically, vessel stow planning is performed with an onboard computer lashing program that can calculate the maximum permissible stack weights for each individual stack based on the provided container lashing arrangements, and then the permissible stack weights are compared against the actual planned stack weights. Should an actual stack weight exceed the permissible, corrective action is to be taken by either reducing the stack weight or modifying the lashing arrangement accordingly.

Consideration regarding the use of the unrestricted lashing and stack weights or the voyage route-specific service lashing and stack weights rest with the vessel’s Master depending on the anticipated conditions to be encountered during the voyage.

The following table illustrates the general relationships between the **CSC**, **CLP** and **CLP-V** notations:

Container Securing Systems	CSC	
Computer Lashing Program	Unrestricted Service	Unrestricted Service and Additional Route Specific Service
	CLP (mandatory if computer lashing program is installed)	CLP-V (mandatory for route specific service)

3 Submission of Plans and Design Data

3.1 General (2012)

Plans showing the arrangements and details of the container securing system are to be submitted for review. These plans are to clearly indicate the scantlings, materials, details, and rated strengths of the container securing system and the arrangements, dimensions, and weights of the containers. Plans are generally to be submitted electronically to ABS. However, hard copies will also be accepted.

3.3 Information to Be Submitted (2012)

The following plans and supporting data are generally to be submitted electronically to ABS. However, hard copies will also be accepted.

- Container stowage arrangement plans
- Cell guide arrangement and scantling plans
- Bridge strut or shoring system arrangement and scantling plans
- Buttress system arrangement and scantling plans
- Container lashing plans
- Details of securing fittings and lashing gear including certificates verifying breaking strength (i.e., prototype and production tests)
- Container loading conditions, to include as a minimum, the condition(s) with the maximum number of containers stowed above and below deck, and the contemplated container weights which result in the greatest metacentric height (GM). The assumed container weights and the location of the center of gravity of the container, if different from 45% of the container height above the base; as well as the vessel particulars including vertical center of gravity, center of flotation, transverse metacentric height, and draft are to be submitted.
- Detailed ship motion studies and calculations, if available
- Securing system calculations
- Container securing manual

5 Definitions and Symbols

Where directions, such as longitudinal, transverse, and vertical, are used in the Guide, they refer to motions, accelerations, or forces that are aligned with the principal axes of the vessel.

5.1 Definitions

The following definitions are given to provide a clearer understanding of terms that are used in the Guide.

Base Sockets

Flush or raised sockets which are welded to the deck, hatch cover or container support foundation and which provide a means of securing the container to the base structure by means of a *Lock Fitting* or similar device. Other commonly used expressions or terms include: *Deck Sockets* or *Twistlock Foundations*. See Section 4, Figure 5.

<i>Bay</i>	An athwartship block of containers associated with a hatch or hatch cover containing multiple stacks (or rows). See Section 2, Figure 1.
<i>Block Stowage</i>	Stowage configuration where several adjacent stacks of containers are connected at one or more tiers. See also <i>Container Block</i>
<i>Bridge Fitting</i>	A device which connects the topmost corner fittings of two adjacent stacks of containers. See Section 4, Figure 3.
<i>Bridge Strut</i>	An adjustable device connecting the outboard-most stack of a below deck block of containers to the vessel's structure when cell guides are not used. Also referred to as <i>Tension/Pressure fitting</i> . See Section 4, Figure 3.
<i>Buttress</i>	A deck mounted tower-like structure which provides horizontal restraint for stacks of deck stowed containers. Portable "locking frames" are sometimes used to connect the container corner fittings to the buttress.
<i>Cell Guides</i>	A rigid securing system of vertical steel angles, spaced with some margin on container length and width that provides alignment and horizontal restraint for container stacks.
<i>Container Block</i>	A number of container stacks interconnected by double stacking cones and/or bridge fittings. Also referred to as <i>Block Stowage</i> .
<i>Container Stack</i>	A single vertical stack of containers which may be secured by lock fittings, lock fittings plus lashings, or cell guides.
<i>Corner Fitting</i>	A fixture, typically a casting, consisting of standard apertures and faces, which provide a common interface for handling and securing containers. It is an integral part of the container end frame structure and is generally in compliance with ISO Standard 1161. A similar fitting can also be found at intermediate posts located some distance from the end frame structure (such as at the 40-ft location on a 45-ft container).
<i>Corner Posts</i>	Reinforced vertical structure between the corner fittings at the ends of containers designed to take the compression and tension forces exerted by lifting, stacking, and securing. Some containers also have intermediate 'corner' posts located some distance in from their ends at a nominal 40-ft spacing. See also <i>Side (Stacking) Post</i>
<i>Cross Ties</i>	A shoring system transferring transverse loads athwartship from cell guides to vessel's structure
<i>CSC Plate</i>	Safety Approval Plate under the International Convention for Safe Containers (CSC), Ref. 6, to be affixed to all freight containers for use at sea (as required by SOLAS). Containers shall not be loaded to more than the maximum gross weight indicated on the CSC plate.
<i>Design Breaking Load</i>	The design breaking load of a component as determined by test of a representative sample. The design breaking load is not to be more than the last load recorded during the test prior to failure. Also referred to as <i>Minimum Breaking Strength (MBS)</i> .
<i>Domestic Containers</i>	Containers designed and built for conveyance by road or rail only. They may not have strength sufficient for marine use and/or fittings in standard locations for shipboard lifting, stacking, and securing.
<i>Double Stacking Cone</i>	A device which fits into container corner fittings to connect adjacent stacks of containers when cell guides are not used.

<i>Fully Automatic Twistlock (FAT)</i>	A twistlock that is inserted and secured in the four bottom corner fittings on the quay before the container is stowed on top of another container onboard the vessel. The geometry of the twistlock design engages the corner fittings of the lower container and does not require stevedores to lock or unlock the fitting when stowing or discharging containers. Special approval is required for certification of a fully automatic twistlock.
<i>Flexible Securing System</i>	System where the stiffness of the container and securing components affect the securing forces and forces developed in the end frame structure of the containers; for example, lashing systems.
<i>High-Cube Container</i>	Container similar in structure to ISO standard containers, but taller. While a standard container has a maximum height of 2591 mm (8'-6"), a high-cube container is 2896 mm (9'-6") tall. Also referred to as <i>hi-cube container</i> .
<i>ISO Freight Container</i>	Containers meeting the design dimensions and ratings of ISO container standards such as: <u>ISO 1496-1 – Series 1 freight containers</u> , Ref. 1. This sets out the basic requirements for containers suitable for international conveyance by road, rail and sea. <u>ISO 668 – External dimensions and ratings</u> , Ref. 2. This standard specifies only dimensions and maximum gross weight (R). <u>ISO 1161 – Corner fittings and specifications</u> , Ref. 3.
<i>Lashing Assembly</i>	A tension element made-up of a rod, wire rope or chain, a tensioning device, and a lashing point; used to secure a stack of containers.
<i>Lashing Bridge</i>	An athwartship, elevated platform between hatches on deck from which container stacks on the hatch covers or deck may be secured with lashing assemblies.
<i>Lashing Points (Eyes)</i>	Fittings welded to the deck, hatch cover, or pedestal that connect the end of a lashing assembly to the vessel structure or hatch covers. These include “D”-rings, fixed or hinged lashing plates, pad eyes, etc. See Section 4, Figure 6.
<i>Linkage Plate</i>	A plate that fits over twistlocks or single stacking cones and connects adjacent stacks of containers.
<i>Lock Fitting</i>	A device inserted into a container corner fitting which can transmit tensile and shear loads associated with the separation forces in a stack of containers. <i>Twistlocks</i> or <i>pin locks</i> are common lock fittings. See Section 4, Figure 2.
<i>Longitudinal Ties</i>	A shoring system transferring longitudinal loads fwd/aft from cell guides to vessel’s structure. These can be tension only elements (e.g., steel wire pendants) or tension/compression members.
<i>Maximum Securing Load (MSL)</i>	The <i>MSL</i> is the allowable load capacity for a device used to secure a container. The term <i>Safe Working Load (SWL)</i> is also used.
<i>Minimum Breaking Strength (MBS)</i>	The <i>MBS</i> is the minimum expected load at which the fitting will fail. Also referred to as <i>Design Breaking Load</i>
<i>Pad Eye</i>	See <i>Lashing Point (Eyes)</i>
<i>Proof Load (PL)</i>	A test load applied to a container securing device during production testing. Generally, the proof load is the safe working load (SWL) of the device multiplied by a factor of 1.1.
<i>Prototype Securing Device</i>	A representative unit of a series of container securing devices or fittings.

<i>Racking</i>	Distortion of the container end or side due to horizontal forces.
<i>Racking Force or Load</i>	Resultant horizontal force on a container end or side from the horizontal static and dynamic forces from ship motions, the securing forces from lashing or shoring, and the self-racking force of the container in question.
<i>Rigid Container Securing System</i>	System where the racking stiffness of the containers does not materially affect the securing forces and forces developed in the end frame structure of the containers; for example, cell guides.
<i>Row (or Stack)</i>	A single vertical stack of containers containing one or more tiers. Also referred to as a <i>stack</i> . See Section 2, Figure 2.
<i>Safe Working Load (SWL)</i>	The <i>design breaking load</i> or <i>minimum breaking strength (MBS)</i> of a securing device divided by an appropriate safety factor. The maximum resultant load upon a component is not to exceed the <i>SWL</i> . See also <i>Maximum Securing Load (MSL)</i> .
<i>Semi-Automatic Twistlock (SAT)</i>	A twistlock that is inserted and secured in the four bottom corner fittings on the quay before the container is stowed on top of another container on board the vessel. When the container is landed on top of another container, a spring mechanism in the twistlock automatically engages and secures the container above to the container below. This type of twistlock must be manually released or unlocked to discharge the container above. See Section 4, Figure 2.
<i>Self-Racking Force</i>	That portion of the container's own gross weight which contributes to the racking load on the container.
<i>Side (Stacking) Post</i>	The vertical part of the container side between upper and lower container fittings that is reinforced to take stacking and lifting loads. These posts are usually provided on containers greater than 40-ft to facilitate standard lifting and stacking at a 40-ft spacing. See also <i>Corner Post</i> .
<i>Shoring</i>	A pad, rail, brace, or framework which provides horizontal support for containers.
<i>Single Stacking Cone</i>	A device inserted into a container corner fitting which provides alignment and shear restraint in a stack of containers when cell guides are not used. It provides no tension restraint. See Section 4, Figure 1.
<i>Stack (or Row)</i>	A single vertical stack of containers containing one or more tiers. Also referred to as a <i>Row</i> . See Section 2, Figure 2.
<i>Tensioning Device</i>	An adjustable device used to tighten a lashing (i.e., turnbuckle). See 4/3.3.2.
<i>Tension/Pressure Fitting</i>	An adjustable device connecting the outboard-most stack of a below deck block of containers to the vessel's structure when cell guides are not used. Also referred to as <i>Bridge Strut</i> .
<i>Tier of Containers</i>	In a block of containers consisting of one or more stacks, those containers at the same vertical location in each stack would be considered to be in the same tier.
<i>Tier</i>	An indication of the vertical position of a container in a stack. The first tier is the lowest or bottom-most position in the stack.
<i>Turnbuckle</i>	A specific type of <i>Tensioning Device</i> . See 4/3.3.2.
<i>Twistlock</i>	A fitting inserted into corner fittings and used to secure containers stacked on top of each other in tension, compression, and shear. This is a specific type of <i>Lock Fitting</i> . See Section 4, Figure 2.

Wind Exposed Container

Any container with more than one-third of its lateral area exposed to the wind, either above the top or beyond the ends of adjacent containers. If there is more than 5 m (nominally two-container stacks) transverse separation between the subject container and the adjacent container, the entire subject container is considered wind exposed.

Weather Stack

Any stack of containers in which all containers are wind exposed and, therefore, have a wind load applied. A weather stack need not be the outboard-most stack.

5.3 Symbols

Symbols used in the Guide have the following definitions:

5.3.1 Vessel Particulars

L	=	vessel's length between perpendiculars, in m (ft)
B	=	vessel's molded breadth, in m (ft)
D	=	vessel's molded depth, in m (ft)
d	=	vessel's draft to the summer load line, in m (ft)
GM	=	transverse metacentric height, in m (ft)

5.3.2 Motions and Accelerations (1 February 2017)

<i>Symbols</i>	<i>Description</i>	<i>Section Reference</i>
T_R, T_P, θ, ϕ	Natural roll and pitch period and amplitude	6/3.5.2 6/Figure 1
k_r, C	Constants used in roll and pitch calculations	6/3.5.2
R_{CTR}, P_{CTR}	Roll and pitch center	6/3.5.2 6/Figure 1
x_C, y_C, z_C	Longitudinal, transverse, and vertical distance from vessel origin to center of gravity of container	6/3.7 6/Figure 1
a_0, k_C, k_3	Constants used in acceleration calculations	6/3.7
$A_T, A_{VMAX}, A_{VMIN}, A_L$	Accelerations at a point in the transverse, vertical (max and min), and longitudinal directions.	6/3.7.1 and 6/3.7.2
$a_{GT}, a_{RT}, a_{GRV}, a_{RV}, a_{GPV}, a_{PV}, a_{GL}, a_{PL}$	Acceleration components in the transverse, vertical, and longitudinal directions due to gravity, roll, and pitch	6/3.7.1 and 6/3.7.2

5.3.3 Container Properties and External Forces (1 May 2017)

<i>Symbols</i>	<i>Description</i>	<i>Section Reference</i>
$W_{(i)}$	Gross container weight in tier (i)	6/3.13.1
$L_{C(i)}, H_{C(i)}$	Length and height of container in tier (i)	6/3.13.4
K_{CT}, K_{CL}	Container racking spring constants at ends for deflection in transverse direction and in sides for longitudinal deflection	3/7
$P_w, F_{W(i)}$	Wind pressure and wind force at tier (i)	6/3.13.4
$F_{H(i)}, F_{L(i)}, F_{V(i)}$	Force components at tier (i) in the horizontal (transverse), longitudinal, and vertical directions.	6/3.13.1 to 6/3.13.3

5.3.4 Lashing Properties (1 February 2017)

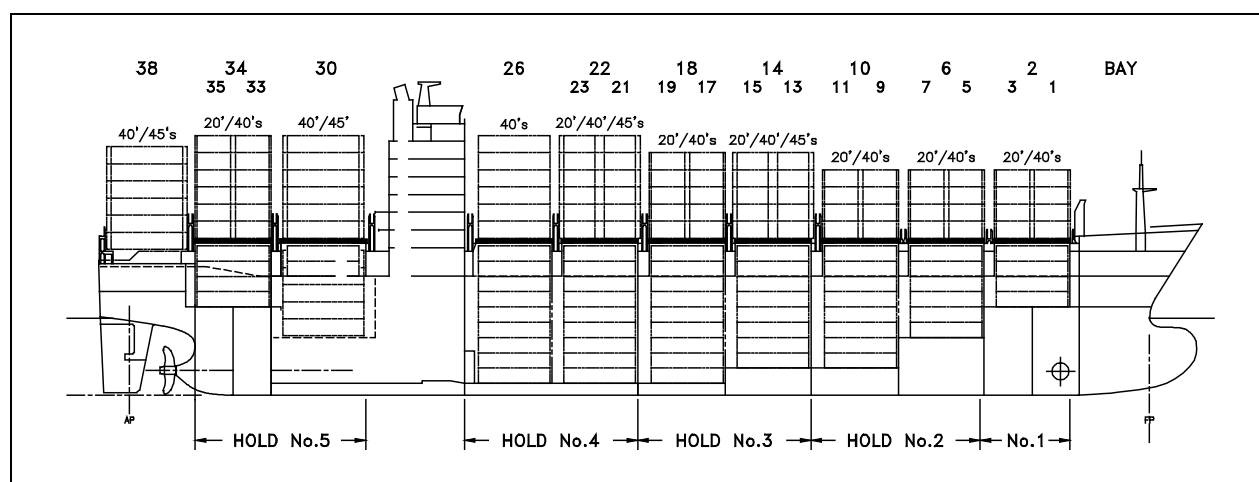
Symbols	Description	Section Reference
E_ℓ	Equivalent elastic modulus of the lashing assembly	Section 4, Table 2
A_ℓ	Cross sectional area of lash assembly tension element	Section 4, Table 1
L_ℓ, L_Z, L_Y, L_X	Total length of lash assembly and its vertical (Z), transverse (Y), and longitudinal (X) projection	4/3.5.2, 6/5.5.1(a)

7 Descriptions of Container Stowage Locations

The following terms, used to describe container stowage locations (slot numbering system) onboard ship, are derived from Ref. 4, ISO standard 9711-1:1990. The ISO Bay Plan System is shown Section 2, Figures 1 and 2

Bay or Bay Number	An athwartship row of containers associated with a hatch or hatch cover that identifies longitudinal location and container length (even numbers are used for 40-ft containers and odd numbers generally refer to 20-ft containers).
Row or Row Number	A vertical stack of containers that identifies transverse location from centerline. Also referred to as <i>Stack</i> or <i>Stack Number</i>
Tier or Tier Number	A horizontal group of containers that identifies the vertical location from a reference point – typically from the inner bottom below deck and from the weather deck or hatch cover on deck.

FIGURE 1
ISO Bay Numbering Scheme



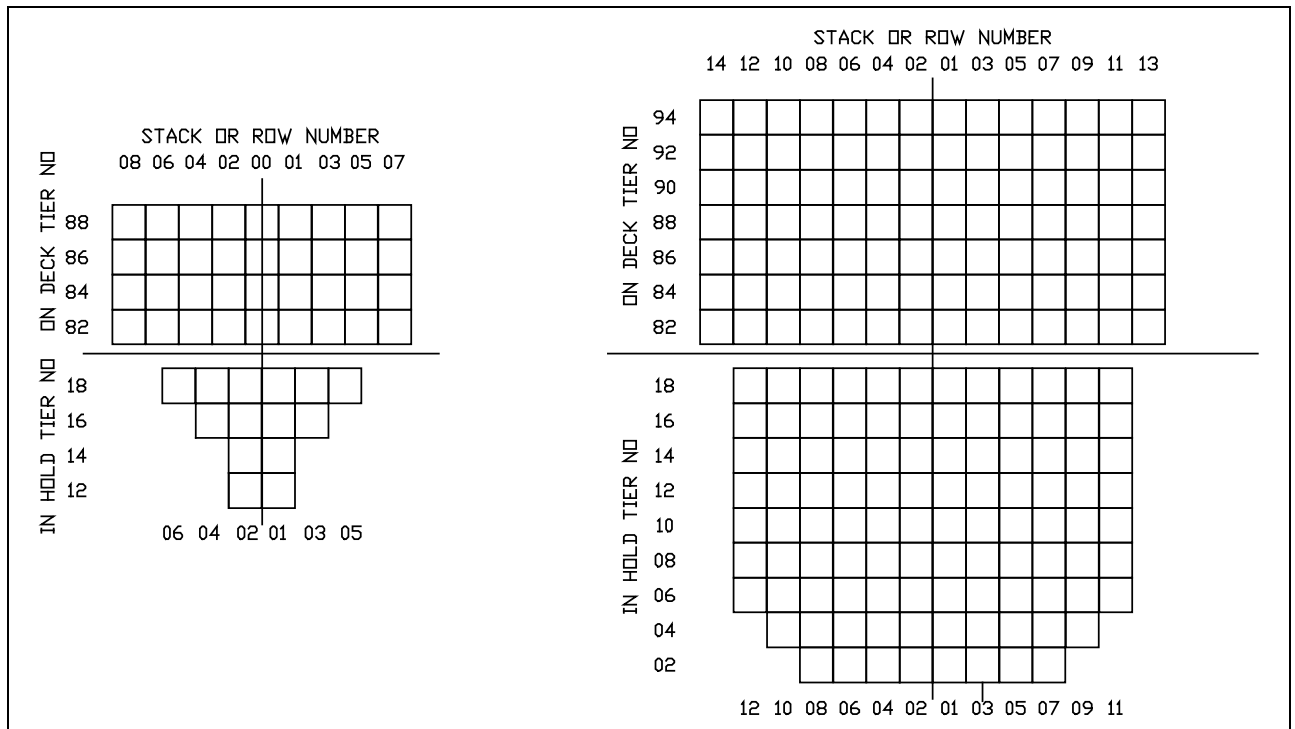
The ISO Bay Plan system utilizes a six digit number to uniquely describe each container slot location.

The first two digits indicate the bay number. The first 40-ft container bay starting at the bow is 02 and each 40-ft bay thereafter is numbered in increments of 4 (02, 06, 10, 14, 18,...). 20-ft container bays use the odd numbers preceding and following the 40-ft bay numbers. For example the bay numbers for the 20-ft containers stowed on the same hatch cover as the 40-ft at bay 14 would be bays 13 and 15.

The third and fourth digits indicate the row or stack number. For a stowage arrangement with an even number of bays in the hold or on deck, the odd numbered stacks are numbered sequentially (by 2's) on the starboard side, beginning with 01 at the stack closest to centerline, and similarly for the even numbers on the port side. For an odd number of rows on deck, the centerline stack is numbered 00, the starboard stacks are numbered 01, 03, 05,...; and the port stacks are numbered 02, 04, 06,...

The fifth and sixth digits indicate the tier number. Below deck, the first tier just above the inner bottom is 02. Each tier above is numbered sequentially by 2's (02, 04, 06, 08, 10,...). The first tier on deck is 82 and for each tier above, the number increases by 2 (82, 84, 86, 88, 90,...).

FIGURE 2
ISO Stack/Row and Tier Numbering Scheme





SECTION 3 Container Characteristics

1 General

All cargo containers used for ocean transport are to have a proper CSC Approval Plate affixed (as defined in the IMO International Convention for Safe Containers 1972, Ref. 5) and should meet the minimum strength and load requirements of ISO 1496-1:1990, Ref. 1. Where special containers are used for unique cargoes that have reduced or increased load capacities, these limitations shall be considered when stowing them onboard ship and also when determining permissible tier and container stack weights.

3 Dimensions

The premise of this Guide is that the dimensions of the containers and characteristics of the corner fittings or castings are in agreement with the international standards given in ISO 668:1995 and ISO 1161:1984. Even so, there are some ocean transport containers that are not defined by these references, and Section 3, Table 1 and Table 2 are offered as a brief summary of the dimensions for standard ISO containers and for some additional commonly used container sizes.

TABLE 1
External Container Dimensions and Tolerances

SI & MKS Units

Nominal Size	Gross Mass	External Dimensions					
		Length	Tolerance	Width	Tolerance	Height	Tolerance
	kg	mm	mm	mm	mm	mm	mm
10 ft ISO 668	10,160	2991	+0/-5	2438	+0/-5	2438	+0/-5
20 ft ISO 668	30,480	6058	+0/-6	2438	+0/-5	2438	+0/-5
						2591	+0/-5
30 ft ISO 668	30,480	9125	+0/-10	2438	+0/-5	2591	+0/-5
						2896	+0/-5
40 ft ISO 668	30,480	12192	+0/-10	2438	+0/-5	2591	+0/-5
						2896	+0/-5
45 ft	30,480	13716	+0/-10	2438	+0/-5	2896	+0/-5
48 ft	30,480	14630	+0/-10	2591	+0/-5	2908	+0/-5
53 ft	30,480	16154	+0/-10	2591	+0/-5	2908	+0/-5

US Units

Nominal Size	Gross Mass	External Dimensions					
		Length	Tolerance	Width	Tolerance	Height	Tolerance
	lb	ft-in	in.	ft-in	in.	ft-in	in.
10 ft ISO 668	22,400	9'-9 ³ / ₄ "	+0/- ³ / ₁₆	8'-0"	+0/- ³ / ₁₆	8'-0"	+0/- ³ / ₁₆
20 ft ISO 668	67,200	19'-10 ¹ / ₂ "	+0/- ¹ / ₄	8'-0"	+0/- ³ / ₁₆	8'-0"	+0/- ³ / ₁₆
						8'-6"	+0/- ³ / ₁₆
30 ft ISO 668	67,200	29'-11 ¹ / ₄ "	+0/- ³ / ₈	8'-0"	+0/- ³ / ₁₆	8'-6"	+0/- ³ / ₁₆
						9'-6"	+0/- ³ / ₁₆
40 ft ISO 668	67,200	40'-0"	+0/- ³ / ₈	8'-0"	+0/- ³ / ₁₆	8'-6"	+0/- ³ / ₁₆
						9'-6"	+0/- ³ / ₁₆
45 ft	67,200	45'-0"	+0/- ³ / ₈	8'-0"	+0/- ³ / ₁₆	9'-6"	+0/- ³ / ₁₆
48 ft	67,200	48'-0"	+0/- ³ / ₈	8'-6"	+0/- ³ / ₁₆	9'-6.5"	+0/- ³ / ₁₆
53 ft	67,200	53'-0"	+0/- ³ / ₈	8'-6"	+0/- ³ / ₁₆	9'-6.5"	+0/- ³ / ₁₆

TABLE 2
Container Corner Fitting Dimensions and Tolerances

SI & MKS Units

Nominal Size	Gross Mass	Dimensions Center to Center of Corner Fittings			
		Length	Tolerance	Width	Tolerance
	kg	mm	mm	mm	mm
10 ft ISO 668	10,160	2787	+3/-5	2259	+0/-5
20 ft ISO 668	30,480	5853	+3/-5	2259	+0/-5
30 ft ISO 668	30,480	8918	+4/-6	2259	+0/-5
40 ft ISO 668	30,480	11985	+4/-6	2259	+0/-5
45 ft	30,480	11985	+4/-6	2259	+0/-5
		13509	+4/-6		
48 ft	30,480	11985	+4/-6	2259	+0/-5
		14422	+4/-6		
53 ft	30,480	11985	+4/-6	2259	+0/-5
		15947	+4/-6		

US Units

Nominal Size	Gross Mass	Dimensions Center to Center of Corner Fittings			
		Length	Tolerance	Width	Tolerance
	lb	ft-in	in.	ft-in	in.
10 ft ISO 668	22,400	9'-1 ²³ / ₃₂ "	+1/8/- ³ / ₁₆	7'-4 ³¹ / ₃₂ "	+0/- ³ / ₁₆
20 ft ISO 668	67,200	19'-2 ⁷ / ₁₆ "	+1/8/- ³ / ₁₆	7'-4 ³¹ / ₃₂ "	+0/- ³ / ₁₆
30 ft ISO 668	67,200	29'-3 ¹ / ₈ "	+ ⁵ / ₃₂ /- ¹ / ₄	7'-4 ³¹ / ₃₂ "	+0/- ³ / ₁₆
40 ft ISO 668	67,200	39'-3 ⁷ / ₈ "	+ ⁵ / ₃₂ /- ¹ / ₄	7'-4 ³¹ / ₃₂ "	+0/- ³ / ₁₆
45 ft	67,200	39'-3 ⁷ / ₈ "	+ ⁵ / ₃₂ /- ¹ / ₄	7'-4 ³¹ / ₃₂ "	+0/- ³ / ₁₆
		44'-3 ⁷ / ₈ "	+ ⁵ / ₃₂ /- ¹ / ₄		
48 ft	67,200	39'-3 ⁷ / ₈ "	+ ⁵ / ₃₂ /- ¹ / ₄	7'-4 ³¹ / ₃₂ "	+0/- ³ / ₁₆
		47'-3 ⁷ / ₈ "	+ ⁵ / ₃₂ /- ¹ / ₄		
53 ft	67,200	39'-3 ⁷ / ₈ "	+ ⁵ / ₃₂ /- ¹ / ₄	7'-4 ³¹ / ₃₂ "	+0/- ³ / ₁₆
		53'-3 ⁷ / ₈ "	+ ⁵ / ₃₂ /- ¹ / ₄		

When containers with other dimensions are to be used, they should be addressed in the documents submitted for approval.

5 Permissible Container Loads and Strength Ratings

The combined static, dynamic, and securing loads imposed on the container structure are not to exceed those given in Section 3, Table 3 for standard 20-ft and 40-ft containers. These limits are derived, in part, from ISO1496-1:1990.

The allowable loads for standard 45-ft containers are to be assumed equivalent to those for 40-ft containers given in Section 3, Table 3 when the 45-ft containers are supported and loaded at the end walls or at the 40-ft points.

48-ft and 53-ft containers are not commonly used in many services, and an industry standard for strength ratings has yet to be developed. If no specific container strength test data is available for these containers, the strength ratings for 40-ft containers given in Section 3, Table 3 may be used for the design of the securing system if the 48-ft containers and 53-ft containers are supported and loaded only at the end walls. If additional sets of stacking posts are used, see the guidance in 3/5.3.

The design container loads given in Section 3, Table 3 are illustrated in Section 3, Figure 1.

TABLE 3
Design Loads on Containers and Container Fittings (1 February 2017)

Nominal Container Size:			20-ft Container		40-ft Container	
Maximum Gross Weight:			30.48 tonnes	30 Lton	30.48 tonnes	30 Lton
Units:			kN	Ltf	kN	Ltf
End Wall Racking			150	15.0	150	15.0
Side Wall Racking			150	15.0	150	15.0
Corner Post Compression			848	85.1	848	85.1
Transverse Securing Force on Corner Fitting:	Top Corner	Tension	250	25.1	250	25.1
		Compression	250	25.1	250	25.1
	Bottom Corner	Tension	350	35.1	350	35.1
		Compression	350	35.1	350	35.1
Longitudinal Securing Force on Corner Fitting:	Top Corner	Tension	100	10.0	100	10.0
		Compression	50	5.0	50	5.0
	Bottom Corner	Tension	200	20.1	300	30.1
		Compression	200	20.1	300	30.1
Lashing Force on Top and Bottom Corner Fitting due to Internal Lashing (See Section 3, Figure 1)		Vertical	300	30.1	300	30.1
		Horizontal	225	22.6	225	22.6
Lashing Force due to External Lashing	Top Corner	Vertical	300	30.1	300	30.1
		Horizontal	225	22.6	225	22.6
	Bottom Corner	Vertical	300	30.1	300	30.1
		Horizontal	150*	15.0*	150*	15.0*
Vertical Tension on Top Corner Fitting			250	25.1	250	25.1
Vertical Tension on Bottom Corner Fitting			250	25.1	250	25.1

* Higher values are to be specially considered.

For containers which cannot support the above loads due to the container construction standards, the loads are to be properly reduced. See Subsection 2/1.

FIGURE 1
Design Loads for ISO 20-ft and 40-ft Containers (1 February 2017)

