Guideline No.: X-01 (202204)

X-01

CONTAINER SECURING ARRANGEMENTS

Issued date: April 24,2022

Foreword

China Classification Society (hereinafter referred to as CCS) Product Inspection and Testing Guideline (hereinafter referred to as this Guideline) contains the technical requirements, inspection and testing criteria related to classification and statutory survey of marine products to be applied for CCS approval/inspection This

Guideline frees the users to adopt other test methods and requirements which are equivalent to or are stricter than this Guideline.

This Guideline is published and updated by CCS, and is released at http://www.ccs.org.cn. Your comments or suggestions are welcomed and may be sent to our email addressed mp@ccs.org.cn.

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Main changes:

~~The "Normative references" is amended to coordinate with the newest standard.~~Renew the standard version of the 'Normative reference documents', text content modification.

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CONTAINER SECURING ARRANGEMENTS

1 Application

1.1 This Guideline applies to securing arrangements for freight containers complying with ISO Standard Series 1. For other applicable securing arrangements for freight containers not covered by ISO Standard Series 1, reference may be made to in this Guideline.

1.2 This Guideline applies to the securing arrangements for marine freight containers. For land-based freight containers, reference may be referred to in this Guideline.

2 Normative references

2.1 CCS Rules for Classification of Sea-going Steel Ships;

2.2 CCS Rules for Materials and Welding;

2.3 ISO 3874:~~1997/Amd.4:2007~~ Series 1 freight containers - Handling and securing~~; Amendment 1: Twistlocks, latchlocks, stacking fittings and lashing rod systems for securing of containers~~.

3 Terms and definitions

Nil.

4 Drawings and documents

4.1 The following plans and technical documents are to be submitted to CCS for approval when applying for approval:

(1) Detailed structure of products;

(2) Main performance specifications;

(3) Drawing of main parts;

(4) List of physical and chemical properties of materials;

(5) Type test programme (including specific test methods).

4.2 The following technical documents are to be submitted to CCS for information when applying for approval:

(1) Main acceptance criteria for materials;

(2) Operation instructions.

~~**5 Evaluation of welding procedures (where applicable)**~~

~~5.1 Welding procedures are to be evaluated for container securing arrangements which are to be welded such as lashing rods and stacking devices.~~

~~5.2 Welding procedure approval tests are to be carried out in accordance with the requirements in Chapter 3, PART THREE of CCS Rules for Materials and Welding. Welding procedures are to be approved by CCS and furnished with CCS welding procedure approval certificate.~~

5 Technical requirements

5.1 Welding procedures for container securing arrangements are to be approved in accordance with Chapter 3,Part Three of CCS Rules for Materials and Welding .

5.2 The design of container securing arrangements is to be in accordance with the relevant requirements in Appendix 1, Chapter 7, Part Two of CCS Rules for Classification of Sea-going Steel Ships and ISO 3874.

5.3 Container securing arrangements are to be designed for safe working loads (SWL) appropriate to their different service purposes on container ships and made of materials complying with their strength requirements. The minimum proof load is not to be less than that as required in ISO 3874.

5.4 The minimum design breaking load and minimum proof load are to be determined according to Table 5.4.

Table 5.4

Item	Minimum design breaking load kN		Minimum proof load kN	
	SWL ≤ 400	SWL > 400	SWL ≤ 400	SWL > 400
Lashing device				
Steel wire rope	3 × SWL			
Rod (low carbon steel)	3 × SWL		1.5 × SWL	
Rod (high strength steel)	2 × SWL		1.5 × SWL	
Chain (low carbon steel)	3 × SWL			
Chain (high strength steel)	2.5 × SWL			
Fittings and securing arrangements	2 × SWL	SWL + 400	1.5 × SWL	SWL + 200

Note: If any material other than steel is used, breaking load and proof load are to be specially considered.

5.5 The structural dimension of container securing arrangements is to be designed according to the requirements of ISO 3874~~:1997/Amd.4:2007~~, giving attention to the following principles:

(1) Fit dimension with corner fittings is to comply with the requirements of ISO 3874 Standard to keep the effective securing of containers.

(2) Pressed area with corner fittings is to comply with the requirements of ISO 3874 Standard to prevent damage to corner fittings; the parts connected with corner fittings are not to extend into the restricted area of corner fittings.

(3) The securing principles and dimension design of novel fixtures and lashings of containers are to ensure that the container be effectively secured in the intended transportation mode and that any damage to container corner fittings be prevented.

5.6 The design of twist-locks etc. is to be such that the working condition and direction of the lock are easily identifiable.

6 Materials and components

6.1 In general, manufacturers of container securing arrangements are engaged mainly in assembling, with main parts usually being purchased. Materials and components are to comply with relevant requirements of CCS Rules.

6.2 The materials of fixed parts to be connected to the hull or of parts to be welded to the hull are to comply with the relevant requirements of CCS Rules for Materials and Welding, and quality certificates of such materials are to be provided.

6.3 Where main parts are marine plates or steel wire ropes, ~~quality~~ CCS certificates or equivalent documants of marine product ~~of such parts signed by CCS~~ must be provided.

6.4 The yield stress of high carbon steel to be used in container securing arrangements is not to be less than 315 N/mm^2.

6.5 The minimum safe working temperature required for materials of container securing arrangements must be not lower than that for materials of corner fittings and is at least to be -20℃.

6.6 The materials of turning and locking mechanisms of container securing arrangements are to be resistant against salt-mist corrosion.

7 Type test

7.1 Selection of typical samples

(1) In principle, 2 pieces are to be selected from each type and each specification of the products for prototype test when applying for design approval of container securing arrangements.

(2) If the products to be approved are of many types and specifications, the number of samples for prototype test may be appropriately reduced for products of different specifications under the same type, based on the same drawing approved by CCS according to the drawing no.

7.2 Type test items

7.2.1 Type test is to be carried out according to the requirements in Appendix 1, Chapter 7, Part Two of CCS Rules for Classification of Sea-going Steel Ships, ISO 3874~~:1997/Amd.4:2007~~ and approved plans.

7.2.2 The type test of the product is to include the following:

(1) Retest of main parts and materials (chemical composition, mechanical properties):

Physical and chemical properties of main parts and materials are to be retested and the test results are to comply with the relevant requirements of CCS Rules for Materials and Welding or requirements of related standards.

(2) Visual examination:

Visual examination is to be carried out and no obvious external defects such as cracks, pores, scales and laps are allowed.

(3) Dimension examination:

Dimensions are to be measured and are to comply with the requirements for dimensions and tolerances in the plans approved by CCS.

(4) Proof load test:

After the proof load test, container securing arrangements are not to have permanent distortion or initial cracks. The proof load test is to include not only routine test items (e.g. tension strength, shear strength) specified by CCS rules and approved plans, but also pressure test of intermediate metal plates and cone apex, etc. using the test methods specified in Appendixes A,

B, C, D of ISO 3874~~:1997/Amd.4:2007~~.

If any test method of a novel product that is not mentioned in Appendix A, B, C, D of ISO 3874~~:1997/Amd.4:2007~~ is to be used, the practical operation condition of such product is to be simulated.

(5) Breaking load test:

Breaking load test is to be carried out to container securing arrangements. The product is not to be broken until the test load reaches the minimum breaking load.

(6) Test of operational flexibility of parts:

Operation test is to be carried out after load test. The moving parts are to be flexible so as to ensure normal function of the product.

8 Unit/batch inspection

8.1 For products in batches, the unit/batch inspection may be carried out either as batch inspection or as unit inspection.

8.2 Test by batches: One from every 50 pieces (any number less than 50 is to be taken as 50) of each type from each batch is to be subjected to proof load test. For lashing chains and wire ropes, one from every 50 pieces (any number less than 50 is to be taken as 50) is to be subjected to breaking test.

8.3 Test by pieces: Each piece is to be subjected to permissible load test according to its safe working load. For lashing chains and wire ropes, one piece is to be subjected to breaking test.

8.4 Not less than 2% of the total number of the products are to be subjected to visual examination and dimension measurement, no matter whether batch inspection or unit inspection is adopted.