



MARINE SAFETY  
RDIMS 1197043v3

# UNITIZED CARGO STANDARD

<b>Responsible Authority</b>	<b>Approval</b>
The Director, Ships and Operations Standards, Marine Safety is responsible for this document, including any change, correction or update.	Gerard McDonald  _____  Director General Marine Safety  Date: <u>May 20, 2005</u>

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### Important Notices and Disclaimers

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## Preface

Canada is a significant destination for international and domestic cargo ships. Because these ships may load or discharge unitized cargo, standards are required in order to meet legislation such as the requirement for Tackle. These requirements apply in respect of wire banding or flat steel strapping that unitizes cargo when the unitized cargo is lifted using the banding or strapping.

It is recognized that the industry, has made commitments to the goal of a better standards and has developed these for best practices within its industry sector. This standard builds on the industry approach and provides a Canadian perspective. The intent is that the Standard should provide a clear indication to operators, cargo gear owners and users of the procedures that they must develop in order to comply with Canadian legislation and at the same time include practices that the industry and operators have agreed to follow to meet or exceed current regulatory requirements as well as those under development under CSA2001.

Transport Canada developed this Unitized Cargo Standard in consultation with stakeholders in industry and through the Canadian Marine Advisory Council.

In the case of any disagreement or inconsistency between the provisions of these Guidelines and the provisions in Canadian legislation, the provisions of the legislation shall apply.

Comments or questions on these Guidelines should be referred to the originator of the document as shown on page 2.

**Interpretation**

This Unitized Cargo Standard applies when the unitized cargo is lifted using the banding or strapping .

“shall” refers to an absolute requirement to fully implement these Guidelines;

“should” refers to a condition or procedure that is recommended and ought to be met if possible;

**Application**

This Standard will apply:

- (a) when the unitized cargo is lifted using the banding or strapping ;  
and
- (b) when the cargo is loaded or discharged from a vessel.

**Responsibility**

In the case of unitized cargo and wire banding or flat steel strapping that unitizes cargo,

- (a) before the cargo is loaded on a vessel in Canadian waters, the shipper shall ensure that the regulatory requirements are met in respect of the banding or strapping; and
- (b) while the cargo is being carried on or unloaded from a vessel, the master of the vessel shall ensure that the regulatory requirements are met in respect of the banding or strapping.

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## **UNITIZED CARGO**

### **1. General Provision**

The purpose of this standard is to provide a national guide to unitized cargo requirements, and is applicable only to cargo units being lifted by banding.

### **2. Approvals**

- 1) Approval of banding material and unitizing methods may be obtained by application to the Regional Director, Transport Canada Marine Safety, for your area.

Approval will be granted on the basis of satisfactory tests.

- 2) It should be noted that the actual unitizing of cargo, once the method is approved, is not done under inspection, but that the responsibility for the observance of the required standards, the making of tests and adherence to good quality control, rests with the person offering for shipment such goods, so unitized.

### **3. Materials**

The materials addressed in this standard are flat steel strapping, and wire.



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**4. Flat steel strapping unitizing systems, Section 4-16**

- 1) These systems consist of the automatic machine or hand tool methods of applying and sealing the banding, the banding material and seals, and the lifting arrangement.
- 2) Each manufacturer of flat strapping must obtain approval for his particular strapping and seals, lifting gear, method of unitizing by strapping, and in conjunction with any necessary lifting gear, the method of lifting must be approved.
- 3) A list of suppliers of unitizing strapping who have obtained approval for their material is shown in Appendix I.
- 4) A list of approved units is shown in Appendix II.

**5. Mill Certificate**

- 1) A mill certificate is to be supplied with the strapping.
- 2) The coils are to be numbered and referenced by that number on the mill certificate.
- 3) The mill certificate should show at least the following:
  - (a) Identifying number of each coil, or an identifying quality stamp mark,
  - (b) Width and thickness of the strapping,
  - (c) If coated, the type of coating,
  - (d) Ultimate tensile strength.
- 4) It is preferable that the figure for ultimate strength be simply that for the strapping as is, rather than be shown as the value per square inch of material.

- 5) It is the responsibility of the person using the strapping to check that each coil is referenced on the mill certificate and is adequate for the intended use.

## **6. Seals**

- 1) The type, number fitted, and number of crimps per seal, are to be as directed by the supplier of the strapping.
- 2) The ductility of the strapping must be sufficient to accept the seal crimp, without cracking.

## **7. Equipment Compatibility**

- 1) The strap tensioning gear, seals, and crimper, as well as the strap itself, if from the same supplier, are accepted as being compatible.
- 2) Where seals or strapping or equipment are not from the same supplier, the user is to obtain written assurance from the different suppliers that the intended combination is a compatible one.
- 3) Independent testing by a competent person, to establish compatibility, may be used to resolve impasses.

## **8. Test Requirements**

The strength of the joints is to be established by testing.

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**9. Test Frequency**

- 1) The schedule of tests for flat strapping is to be not less than one per 300 units strapped.
- 2) An alternate test program which has been authorized by the Department is one test per 1000 tons of pulp strapped, but not less than three tests per consignment.
- 3) The above tests are for checking the satisfactory operation of the equipment during the production run, and are additional to any tests necessary to ensure the equipment is operating properly following modifications, repairs or prolonged shutdown of the equipment.
- 4) A similar test frequency is to be employed on any pulp restrapped subsequent to poor test results, or damage to original strapping.
- 5) It must be noted that complying with the above test schedule does not relieve the person or mill strapping the unit from the responsibility of ensuring that all seals and strapping are properly put on.

**10. Test Record**

- 1) A record of tests is to be retained at the establishment where the cargo was unitized and must be signed by the person doing or supervising the testing.
- 2) The test record and the units covered by the sample testing are to be identifiable one to the other by an identifying number.

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**11. Test Certificate**

A test certificate similar to that shown in Appendix III shall be prepared by the person responsible for the unitizing of the cargo, and a copy of the certificate shall accompany the units.

**12. Test Equipment**

- 1) The sealed joints to be tested may be pulled by a firm engaged in testing materials and their certificate constitutes the record of tests.
- 2) The establishment doing the unitizing may make the tests themselves provided their pulling machine has been calibrated, to ensure its accuracy.

The testing equipment at such an establishment may be either a unit to measure the ultimate tensile strength of the piece tested, or alternatively a unit that applies a limited certain force, such that the material tested is shown to be capable of withstanding the tensile load for which the machine is set.

Where the testing apparatus is of the latter type, and so that no misunderstanding occurs as to the setting of the machine, a notice shall be attached to the machine indicating its tensile setting, or alternatively, the setting may be referenced to the unit weight for which it is set up.

**13. Strapping Strength**

- 1) All units banded for single lift purposes must be so banded as to provide a minimum safety factor on the strapping of 3.5:1. All units banded for multiple lift purposes, by which it is permitted to lift the unit on four separate occasions, must be so banded as to provide a minimum safety factor on the strapping of 4:1.

- 2) Other than in special cases, all units whether basket handle type or single band type or any variations of the same, are to be banded to provide for a bridle angle of 40 degrees. The minimum strength of the banding shall therefore be:

Safety Factor X Half Weight of Unit X Secant of Bridle Angle

The bridle angle referred to is that angle contained between the vertical and the maximum allowable angular departure of the strapping from the vertical under the lift conditions, that is to say it is the angle at one of the top corners of the unit, contained between the vertical and the lifting strap.

- 3) A special strapping case in point, is that of units specifically designed for a vertical condition of the strapping during lifting, and so lifted, whereby no need arises to make provision for bridle effect.
- 4) In addition to the above, banding used for multiple lift unitizing shall be of such a nature as to adequately withstand exposure of the material during its intended service life.

#### **14. Joint Location and Efficiency**

Where the seals on the strapping of a flat band type unit, are located on the bottom of the unit, and thus projected by friction from the full lifting stress, and where such sealed joint provides not less than 90% of the strapping strength, then the straight line strapping strength as indicated on the mill certificate may be used in establishing the required banding strength.

Where the seals are on the side or top of the unit, the banding strength shall be taken to be the sealed joint strength.

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**15. Use – Flat steel strapping**

- 1) It should be noted that where strapping has a safety factor of 3.5:1, and the unit is therefore only permitted to be lifted on one occasion by its strapping, then that lift shall be from the dock into its final position in the ship. Other lifting methods must be used for all other occasions.
- 2) Banding to be in virtually new condition at time of first use.
- 3) Units awaiting shipment to be reasonably protected.
- 4) Only approved lifting gear should be used on the strapping.
- 5) The lifting hooks and the lifting band should fall reasonably within the same vertical plane.

**16. Modifying existing strapping system**

A Regional Manager may authorize the modifying of the lifting band from a basket handle type to a single band type, provided:

- (a) A check is made in all cases where this is to be done, that the existing strapping is sufficiently strong to accommodate the increased stress due to the bridle effect.
- (b) A representative joint is tested at the beginning of the operation to ensure that an adequate joint is being made.
- (c) The same schedule of tests as set out for new units is to be observed.
- (d) Repaired units are identified in the record of tests.
- (e) Repaired units are rated for single lift only.

**17. Round wire unitizing system, Section 17-27**

- 1) The systems consist of the wire applying machine, wire used, and lifting arrangement.
- 2) Each manufacturer of round wire banding must obtain approval for his particular wire, method of knotting the wire, lifting gear, method of unitizing by wire banding, and in conjunction with any necessary lifting gear, the method of lifting must be approved.
- 3) A list of suppliers of unitizing wire who have obtained approval for their material is shown in Appendix I.
- 4) A list of approved units is shown in Appendix II.

## **18. Mill Certificate**

- 1) A mill certificate is to accompany all wire used in unitizing.
- 2) Each coil of wire is to be identifiable to the mill certificate.
- 3) The mill certificate should show at least the following:
  - (a) Identifying number of each coil,
  - (b) Diameter of wire,
  - (c) Straight line breaking strength.
  - (d) Knotted breaking load, or alternatively the elongation in a 10" test piece.
- 4) The elongation in such a test piece is not to be less than 7%.
- 5) It is the responsibility of the person using the wire to check that each coil is referenced on the mill certificate and is adequate for the intended use.

## **19. Equipment Compatibility**

- 1) The wire applying equipment as well as the wire itself, if from the same supplier, are accepted as being compatible.
- 2) Where equipment and wire are from different suppliers, the user is to obtain written assurance from both suppliers, that the combination of wire and equipment being used, is compatible.
- 3) Independent testing by a competent person, to establish comparability, may be used to resolve impasses.

## **20. Test Frequency**

The schedule of tests for round wire banding is one test of the straight wire, and one test of the wire in the knotted condition every time the coil is changed; and in addition one test of the wire in the knotted condition each shift (a shift is considered to be eight hours of production run).

## **21. Knotted Strength**

- 1) In the manufacture of the wire used in unitizing, there is a variation of tensile strength from about 140,000 PSI to 160,000 PSI, and a variation in diameter of  $\pm .0015$ ". The minimum strength for the gauge size will be stipulated by the company doing the unitizing, and shall be the strength allowed in determining the number of wires required on the unit, thus variations in wire used in unitizing, will result in the wire having a higher breaking strain than the stipulated minimum.
- 2) The knotted efficiency is to be not less than 90% of the stipulated minimum, thus where wire is in fact somewhat stronger than the stated minimum, the joint efficiency may be less than 90% of the actual wire strength.



- 3) Where at any time joint efficiency is found to have dropped below the required minimum, the supplier of the wire and knotting equipment should be immediately notified.
- 4) Where a slight decrease in joint efficiency is discovered and fully compensated for by fitting additional wires to all units covered by the representative test, then the fact that such compensation has been made in the banding should be recorded in the test record.

## **22. Test Records**

- 1) A record of tests is to be retained at the establishment where the cargo was unitized, and must be signed by the person doing or supervising the testing.
- 2) The test record and the units covered by the sample testing are to be identifiable one to the other by an identifying number.

## **23. Test Certificate**

A test certificate similar to that shown in Appendix III shall be prepared by the person responsible for the unitizing of the cargo, and a copy of the certificate shall accompany the units.

## **24. Test Equipment**

- 1) The wire and knot tests required, may be done by a firm engaged in testing materials and their certificate constitutes the record of tests.
- 2) The establishment doing the unitizing may make the test themselves provided their pulling machine has been calibrated, to ensure its accuracy.

- 3) The testing equipment at such an establishment may be either a unit to measure the ultimate tensile strength of the piece tested or alternatively a unit that applies a limited certain force, such that the material tested is shown to be capable of withstanding the tensile load for which the machine is set.

Where testing apparatus is of the latter type and so that no misunderstanding occurs as to the setting of the machine, a notice shall be attached to the machine indicating its tensile setting or alternatively the setting may be referenced to the unit weight and number of wires for which it is set up.

## 25. Banding Strength

- 1) All units banded for single lift purposes must be so banded as to provide a minimum safety factor on the banding of 3.5:1.
- 2) All units banded for multiple lift purposes, by which it is permitted to lift the units on four separate occasions, must be so banded as to provide a minimum safety factor on the banding of 4:1.
- 3) It must be particularly noted that in the case of several strands of wire forming the lifting band, it is essential that all be evenly tensioned.
- 4) Other than in special cases, all wire banded units are to be banded to provide for a bridle angle of 40°. The minimum strength of the banding shall therefore be:

Safety Factor X Half Weight of Unit X Secant of Bridle Angle

The bridle angle referred to is that angle contained between the vertical and the maximum allowable angular departure of the wire banding from the vertical under the lift conditions, that is to say it is the angle at one of the top corners of the unit, contained between the vertical and the lifting band.

- 5) A special banding case in point is that of units specifically designed for a vertical condition of the banding during lifting, and so lifted, whereby no need arises to make provision for bridle effect.
- 6) In addition to the above, banding used for multiple lift unitizing shall be of such a nature as to adequately withstand exposure of the material during its intended service life.

## **26. Joint Location and Efficiency**

Where the banding wire knots are located on the bottom of the unit, and where such knots provide not less than 90% of the required minimum strength of the wire, then the straight line stipulated minimum strength of the wire as called for by the unitizer's specification, may be used in establishing the required banding strength.

## **27. Use - Wire banding**

- 1) It should be noted that where banding has a safety factor of 3.5:1, and the unit is therefore only permitted to be lifted on one occasion by its banding, then that lift shall be from the dock into its final position in the ship. Other lifting methods must be used for all other occasions.
- 2) Banding to be in virtually new condition at time of first use.
- 3) Units awaiting shipment to be reasonably protected.
- 4) Only approved lifting gear should be used on the banding.
- 5) The lifting hooks and the lifting band should fall reasonably within the same vertical plane.

### **THE REMAINING SECTIONS APPLY TO BOTH WIRE AND FLAT BAND**

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**28. Suitability of Lifting Gear**

- 1) In any instance where cargo unitized with flat strap or wire of a particular manufacturer, is to be lifted with gear other than that originally approved for the banding in question, then to establish that such combination of banding and lifting hook is compatible, a test consisting of not less than 20 sequential lifts with the banding in a 100% overload condition shall be made.

Where no damage occurs to either the banding or lifting hook, as a result of the test, the combination will be considered a safety arrangement.

- 2) In the instance of tests relating to the use of lifting gear for multiple lift purposes, a sample of the banding in way of the lifting hook its to be tested to destruction with no significant reduction in tensile strength being noted.

**29. Stability of units**

- 1) The method of combining the individual parts into a shipping unit shall produce a stable unit with high package strength. This package strength and stability may be:
  - (a) Inherent - e.g. plywood or lumber units.
  - (b) Compact - e.g. cubic paper pulp bales with a taut encircling band.
  - (c) Locked - e.g. round paper rolls, with strapping so interlocked as to prevent escape of individual parts.
- 2) The unit, ideally, should be able to withstand compression in stowage and rough handling to the extent that failure of the strapping shall occur before disintegration of the unit due to lack of packaging stability.

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**30. Testing for Multiple lift application**

- 1) (a) Fatigue Test - Four units of cargo shall be prepared. Banding or strapping as the case may be shall have as a minimum a safety factor of 4:1 and shall provide for a bridle angle of 40 degrees.

Samples of the banding or strapping in way of the lifting hooks shall be taken at intervals of 4 lifts, 10 lifts, 20 lifts and 50 lifts.

These samples shall be tested to destruction, along with a sample of unused banding or strapping; no significant deterioration of the banding or strapping shall occur over the series of lifts - maximum loss 15%.

- (b) Abrasion Test - Bottom: Unit shall be moved a distance of 6 feet across horizontal concrete surface.

Corner: Unit shall be moved a distance of 3 feet up 7° sloping concrete surface.

- (c) Impact Test - Unit shall be drawn 18" out of vertical, then allowed to swing freely back the 18" to contact edge of a 3/8" steel plate. Impact to be in way of banding or strapping. The edge of the plate may be hammer dressed.

- (d) Hang Test - Unit shall be lifted and remain suspended for a period of four (4) minutes.

- 2) Test pieces for all the tests referred to in (b) to (d) shall be taken in any resulting areas of damage or deformation. The test results shall show no significant deterioration - maximum loss 15%.

**31. Conditions relating to multiple lift units**

- a) Each approval applies only to the system tested.

- 
- b) The safety factor on the banding to be not less than 4:1.
  - c) The maximum number of lifts of the subject unit by its lifting band shall not exceed four lifts.
  - d) The duration of any lift shall not exceed four minutes. This is to avoid excessive transportation of the unit by its banding.

Where however, in cargo processes, circumstances cause the duration of the lift to exceed the above limitation in order to accommodate practical requirements, then the actual duration of the lift shall constitute the permitted duration.

- e) The interval between the first and the last occasion on which the unit is lifted by its banding shall not exceed four months.
- f) A test certificate relating to the subject units, and similar to that shown in Appendix 3, must always accompany the shipment.

This certificate shall in addition to attesting to the quality of the banding, and identifying the units to which it relates, show the lifting history.

- g) Stevedores are to be advised to exercise particular care in any secondary handling of multiple lift units, in accordance with the provision of the Tackle Regulations.

This provision is as follows:

“Except in an emergency, no worker shall be required to work with or in proximity to goods which are dangerous to life or health by reason of their nature or condition unless all precautions have been taken to safeguard the workers, and to advise them of the conditions existing.”

The above condition is required to offset any hazard due to the uncertainty of the condition of the slings after a sea voyage.

The Master of the vessel which is to discharge such units, or the shipper of cargo or his agent, where reloading of such units is to occur, shall advise the stevedores accordingly.

## **Appendix I**

List of approved material suppliers:

### Flat Strapping

Acme Steel Ltd.  
Signode Steel Ltd.  
Delta Hoesch Ltd.

### Wire Banding

Cranston/Tennant Griplock Ltd.  
Gerrard-Oval Strapping Ltd.  
Swedish Wire Corporation Ltd.  
Tree Island Industries Ltd.  
Titan Steel and Wire Co. Ltd.  
Weld-Loc/Strapex (Canada) Inc.

## Appendix II, Sht. #1

CARGO	VERTICAL LIFT FLAT STRAP	BRIDLE LIFT FLAT STRAP	VERTICAL LIFT WIRE	BRIDLE LIFT WIRE
Paper Pulp	Signode (S) Acme (S)	Signode (S) Signode (M) Acme (S) Acme (M)	Oval (S)	Tennant/Cranston (S) Tennant/Cranston (M) Oval Strapping (S) Oval Strapping (M) Swedish Wire Corp (S) Swedish Wire Corp (M) Tree Island Ind. (S) Tree Island Ind. (M) Titan Steel (S) Titan Steel (M) Weld-Loc/ (S) Strapex (Can) Inc (M)
(1) Paper Pulp Round Bales Locked Encircling Strapping		(1) Signode (S)		
(2) Through Core - Twin Stack	(2) Signode (S)	(2) Acme (M) Signode (M)		
(3) Through Core - Plug and Strap	(3) Signode (S)			
(4) Crossed Wires - Single Point Lift, 60° Bridle Angle				(4) Oval (S)
Plywood		Signode (S) (D)	Oval (S)	



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		Signode (M)(D) Acme (S) (D) Acme (M)(D)		
Lumber		Acme (S) (D) Acme (M)(D) Signode (S) (D) Signode (M)(D)		Tennant/Cranston (S)

**Appendix II, Sht. #2**

CARGO	VERTICAL LIFT FLAT STRAP	BRIDLE LIFT FLAT STRAP	VERTICAL LIFT WIRE	BRIDLE LIFT WIRE
(1) Aluminum Ingots ----- (2) Cylindrical Billets	(1) Signode (S)	(1) Signode (S)(D) ----- (2) Signode (M)		
Zinc Ingots		Signode (S) (D) Signode (M)(D)		
Lead Ingots		Signode (S) (D) Signode (M)(D)		
Copper Ingots		Signode (S) (D) Signode (M)(D) Acme (S) (D)		

- (S) Single Lift Units  
(M) Multiple Lift Units  
(D) Also Double Continuous Wrap System

**Appendix III, Sht. #1**

**UNITIZED CARGO CERTIFICATE**

Unitizing Plant	Sustained Tensile Test -(S) OR Ultimate Tensile Test (U)
Identifying Mark	
Number of Units	
Weight Per Unit	1.
Type of Unit	2.
Commodity	3.
Banding Specification	4.
Knot/Seal Specification	5.
Minimum Breaking Stress Required	6.
Minimum Safety Factor Required	7.
Lifting Method	8.
	9.
	10.
	11.
	12.
	14.
	15.
<u>Lifting History</u>	16.
1.	17.
	18.
2.	19.
	20.
3.	21.
	22.
4.	23.
These units are suitable for lifting on $\frac{ONE}{FOUR}$ occasion(s) provided the bands are not in a damaged condition.	24.
	25.
	26.
Name & Address of Public Service Association Company or Firm making the tests:	
Position of Signatory in Public Service, Association, Company or Firm:	

I certify that on/or between/ the date/s of ..... 19 ..... and ..... 19 ..... samples of banding as sealed/knotted, were tested by a competent person, with the results as shown above. The banding tested was representative of the material used in the unitizing of the above cargo.

The frequency of testing was in accordance with Canadian Ministry of Transport requirements. The banding as applied to the above units at this time, is in good order.

(Signature) ..... (Date) .....

**Appendix III, Sht. #2**

**UNITIZED CARGO ANNUAL CERTIFICATE**

**STANDING CERTIFICATE FOR FLAT STRAP UNITIZED CARGO**

1. Pulp mill or unitizing plant:			
2. Identifying mark:			
3. Number of units:			
4. Weight per unit:			
5. Type of unit:			
6. Number of bands fitted:		Unitizing System:	
7. Banding specification:	Width:	Thickness:	Minimum B.S.:
8. Seal specification:		Position:	
9. Actual minimum breaking strength for the band/seal used:			/
10. Minimum safety factor provided:			
11. Lifting method:			
12. Lifting history:			
These units are-suitable for lifting on $\frac{ONE}{FOUR}$ occasions provided the bands are not in a damaged condition.			
Name and address of public service, company, association or firm making the tests:			
Position of signatory in public service, company, association or firm:			

I certify that between the dates of ..... 19 ..... and ..... 19 ..... all referenced units produced in this establishment have been given the identifying mark shown above and have been unitized under a continuous quality control program. The tests associated with the banding and its application have been carried out by a competent person in accordance with the requirements of the Canadian Ministry of Transport unitizing standards, and a record of these tests is maintained at this plant.

All units presented for shipment are in good order and meet or exceed Ministry requirements.

(Signature) ..... (Date) .....

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**Appendix III, Sht. # 3****NOTES RE. UNITIZING CERTIFICATE**  
**(FLAT STRAP)**

1. Name and address of mill or unitizing plant.
2. This identifying mark is stamped on each unit produced under this standing certificate. It shall provide means of identifying the company, the mill, the machine, the flat strap manufacturer and the date of production. (e.g. bale number)
3. For the principle certificate issued for the annual production of the mill or plant enter 'all units'.  
For the particular copy given the ship the actual number of units on board should also be shown.
4. Show the maximum weight for the unit type.
5. General description e.g. eight bale, kraft pulp, unitized for bridle lift.
6. Show the number of bands which will be provided on each unit. This will be shown as either single or duplex banding.  
  
Indicate unitizing system used.
7. Show the width, thickness and minimum breaking strength of the individual flat strap used. The mill test certificate for the banding is to be retained at the unitizing plant for two years.
8. Give type and number of seals required, and location of seals i.e. top; side; or bottom. Normally the seal strength is used to compute the safety factor, if however the seal is located on the bottom of the unit and provides at least 90% joint efficiency, the strength of the strapping itself may be used to compute the safety factor.

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9. This is the minimum breaking strength required for the unitizing band. This will be the seal strength, if the seal is on the side or top of the unit. E.g. for a 4000 lb. unit, unitized for 40 degrees bridle lift, and banded with single band for a 4:1 safety factor.  
(Note: The bridle effect factor for 40 degrees is 1.3)  
Minimum seal strength =  $4000 \times 0.5 \times 1.3 \times 4 = 10.400$  lbs.
10. The minimum safety factor which must be provided is 3.5 : 1. This permits the unit to be lifted only once by its banding in Canada. Acceptance of the unit for discharge by its banding at the destination port should be confirmed by the shipper. If a 4:1 safety factor is used this is regarded as providing a safe lift condition for 4 separate lifts by its banding. E.g. the unit could be imported into Canada then trans-shipped and discharged at a subsequent port abroad.
11. This describes the lifting conditions which are to be observed. e.g. Bridle lift. Two hooks. Max. bridle angle 40 degrees.
12. This records the lifting history for the particular shipment in question. The first entry would normally show the port of loading, the ship taking the cargo, and the date of loading.

**Appendix III, Sht.# 4**

**UNITIZED CARGO ANNUAL CERTIFICATE**

**STANDING CERTIFICATES FOR WIRE UNITIZED PULP UNITS**

1. Pulp mill:		
2. Identifying mark:		
3. Number of units:		
4. Weight per unit:		
5. Type of unit:		
6. Number of wires fitted:	Unitizing System:	
7. Wire specification:	Diameter:	Minimum B.S.:
8. Knot specification:		
9. Actual minimum breaking strength for the wire/knot used:		/
10. Minimum safety factor provided:		
11. Lifting method:		
12. Lifting history:		
These units are suitable for lifting on $\frac{ONE}{FOUR}$ occasions provided the bands are not in a damaged condition.		
The knot is to be located on the bottom of the unit.		
Name and address of public service, company, association or firm making the tests:		
Position of signatory in public service, company, association or firm:		

I certify that between the dates of ..... 19 ..... and ..... 19 ..... all pulp units produced in this mill that have been given the identifying mark shown above, have been unitized under a continuous quality control program. The tests associated with the wire and its application have been carried out by a competent person in accordance with the requirements of the Canadian Ministry of Transport unitizing standards, and a record of these tests is maintained at this mill.

All units presented for shipment are in good order and meet or exceed Ministry requirements.

(Signature) ..... (Date) .....

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**Appendix III, Sht. #5**

NOTES RE. UNITIZING CERTIFICATE  
(WIRE)

1. Name and address of unitizing plant.
2. The identifying mark is stamped on each unit produced under this standing certificate. It shall provide means of identifying the company, the mill, the machine, the wire manufacturer and the date of production. (e.g. bale number).
3. For the principle certificate issued for the annual production of the mill enter "all units".  
For the particular copy given the ship the actual number of units on board should also be shown.
4. Show the maximum weight for the unit type.
5. General description e.g. eight bale, kraft pulp, unitized for bridle lift.
6. Show the number of wires which will be provided on each unit. This must give at least the safety factor strapped for.  
  
Indicate unitizing system used.
7. Show diameter and minimum breaking strength of the individual wire used. The mill test certificate for the wire is to be retained at the unitizing plant for two years.
8. The knot strength must not be less than 90% of the specified minimum breaking strength of the wire. The specified minimum breaking strength for the particular size of wire used is given by the wire supplier. So long as the knot is on the bottom of the unit, the wire strength rather than the knot strength can be used to compute the safety factor.



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9. This is the minimum breaking strength required for each individual wire in the unitizing band.  
E.g. for a 4000 lb. unit, unitized for 40 degrees bridle lift, and banded with 6 wires for a 4:1 safety factor.  
(Note: The bridle effect factor for 40 degrees is 1.3)  
Min. B.S. per wire =  $\frac{4000 \times 0.5 \times 1.3 \times 4}{6} = 1,733\text{lbs}$
10. The minimum safety factor which must be provided is 3.5 : 1. This permits the unit to be lifted only once by its banding in Canada. Acceptance of the unit for discharge by its banding at the destination port should be confirmed by the shipper. If a 4:1 safety factor is used this is regarded as providing a safe lift condition for 4 separate lifts by its banding. e.g. the unit could be imported into Canada then trans-shipped and discharged at a subsequent port abroad.
11. This describes the lifting conditions which are to be observed. e.g. Bridle lift. Two hooks. Max. bridle angle 40 degrees.
12. This records the lifting history for the particular shipment in question. The first entry would normally show the port of loading, the ship taking the cargo, and the date of loading.

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## **Schedule 1 – Applicable Canadian Legislation**

The following federal acts , regulations and Code are relevant to the use of cargo gear and lifting appliances.

### *Canada Shipping Act*

Sets out regulations authority for accident prevention and inspection of ship's Tackle.

### *Tackle Regulations*

Regulations respecting the protection against accident of workers employed in loading or unloading ships.

### *International Labour Conference :*

Convention 152, Convention concerning occupational safety and health in Dockwork.

### *CSA 2001*

Sets out establishment of regulations for cargo.

### *Cargo Regulations when finalized.*

Sets out establishment for the safe use of tackle including requirements for Unitized Cargo.

## **Schedule 2 – Related Technical Guidance**

ILO Code of Practice for Safety and health in ports

ILO Code of practice ISBN 92-2-115287-1 available from ILO web site at <http://www.ilo.org>